第1章程序设计和C语言1  
1.1什么是计算机程序1  
1.2什么是计算机语言1  
1.3C语言的发展及其特点3  
1.4最简单的C语言程序5  
1.4.1最简单的C语言程序举例6  
1.4.2C语言程序的结构10  
1.5运行C程序的步骤与方法12  
1.6程序设计的任务14

1-5 #include <stdio.h>

int main ( )

{ printf ("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n\n");

printf(" Very Good!\n\n");

printf ("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n");

return 0;

}

1-6#include <stdio.h>

int main()

{int a,b,c,max;

printf("please input a,b,c:\n");

scanf("%d,%d,%d",&a,&b,&c);

max=a;

if (max<b)

max=b;

if (max<c)

max=c;

printf("The largest number is %d\n",max);

return 0;

}

第2章算法——程序的灵魂16  
2.1什么是算法16  
2.2简单的算法举例17  
2.3算法的特性21  
2.4怎样表示一个算法22  
2.4.1用自然语言表示算法22  
2.4.2用流程图表示算法22  
2.4.3三种基本结构和改进的流程图26  
2.4.4用NS流程图表示算法28  
2.4.5用伪代码表示算法31  
2.4.6用计算机语言表示算法32  
2.5结构化程序设计方法34  
习题36

第章最简单的C程序设计——顺序程序设计37  
3.1顺序程序设计举例37  
3.2数据的表现形式及其运算39  
3.2.1常量和变量39  
3.2.2数据类型42  
3.2.3整型数据44  
3.2.4字符型数据47  
3.2.5浮点型数据49  
3.2.6怎样确定常量的类型51  
3.2.7运算符和表达式52  
3.3C语句57  
3.3.1C语句的作用和分类57  
3.3.2最基本的语句——赋值语句59  
3.4数据的输入输出65  
3.4.1输入输出举例65  
3.4.2有关数据输入输出的概念67  
3.4.3用printf函数输出数据68  
3.4.4用scanf函数输入数据75  
3.4.5字符数据的输入输出78  
习题82

3-1 #include <stdio.h>

#include <math.h>

int main()

{float p,r,n;

r=0.1;

n=10;

p=pow(1+r,n);

printf("p=%f\n",p);

return 0;

}

3-2-1

#include <stdio.h>

#include <math.h>

int main()

{float r5,r3,r2,r1,r0,p,p1,p2,p3,p4,p5;

p=1000;

r5=0.0585;

r3=0.054;

r2=0.0468;

r1=0.0414;

r0=0.0072;

p1=p\*((1+r5)\*5); // 一次存5年期

p2=p\*(1+2\*r2)\*(1+3\*r3); // 先存2年期，到期后将本息再存3年期

p3=p\*(1+3\*r3)\*(1+2\*r2); // 先存3年期，到期后将本息再存2年期

p4=p\*pow(1+r1,5); // 存1年期，到期后将本息存再存1年期，连续存5次

p5=p\*pow(1+r0/4,4\*5); // 存活期存款。活期利息每一季度结算一次

printf("p1=%f\n",p1); // 输出按第1方案得到的本息和

printf("p2=%f\n",p2); // 输出按第2方案得到的本息和

printf("p3=%f\n",p3); // 输出按第3方案得到的本息和

printf("p4=%f\n",p4); // 输出按第4方案得到的本息和

printf("p5=%f\n",p5); // 输出按第5方案得到的本息和

return 0;

}

3-2-2

#include <stdio.h>

#include <math.h>

int main()

{double r5,r3,r2,r1,r0,p,p1,p2,p3,p4,p5;

p=1000;

r5=0.0585;

r3=0.054;

r2=0.0468;

r1=0.0414;

r0=0.0072;

p1=p\*((1+r5)\*5); // 一次存5年期

p2=p\*(1+2\*r2)\*(1+3\*r3); // 先存2年期，到期后将本息再存3年期

p3=p\*(1+3\*r3)\*(1+2\*r2); // 先存3年期，到期后将本息再存2年期

p4=p\*pow(1+r1,5); // 存1年期，到期后将本息存再存1年期，连续存5次

p5=p\*pow(1+r0/4,4\*5); // 存活期存款。活期利息每一季度结算一次

printf("p1=%f\n",p1); // 输出按第1方案得到的本息和

printf("p2=%f\n",p2); // 输出按第2方案得到的本息和

printf("p3=%f\n",p3); // 输出按第3方案得到的本息和

printf("p4=%f\n",p4); // 输出按第4方案得到的本息和

printf("p5=%f\n",p5); // 输出按第5方案得到的本息和

return 0;

}

3-2-3

#include <stdio.h>

#include <math.h>

int main()

{float r5,r3,r2,r1,r0,p,p1,p2,p3,p4,p5;

p=1000;

r5=0.0585;

r3=0.054;

r2=0.0468;

r1=0.0414;

r0=0.0072;

p1=p\*((1+r5)\*5); // 一次存5年期

p2=p\*(1+2\*r2)\*(1+3\*r3); // 先存2年期，到期后将本息再存3年期

p3=p\*(1+3\*r3)\*(1+2\*r2); // 先存3年期，到期后将本息再存2年期

p4=p\*pow(1+r1,5); // 存1年期，到期后将本息存再存1年期，连续存5次

p5=p\*pow(1+r0/4,4\*5); // 存活期存款。活期利息每一季度结算一次

printf("p1=%10.2f\n",p1); // 输出按第1方案得到的本息和

printf("p2=%10.2f\n",p2); // 输出按第2方案得到的本息和

printf("p3=%10.2f\n",p3); // 输出按第3方案得到的本息和

printf("p4=%10.2f\n",p4); // 输出按第4方案得到的本息和

printf("p5=%10.2f\n",p5); // 输出按第5方案得到的本息和

return 0;

}

3-3.

#include <stdio.h>

#include <math.h>

int main()

{float d=300000,p=6000,r=0.01,m;

m=log10(p/(p-d\*r))/log10(1+r);

printf("m=%6.2f\n",m);

return 0;

}

3-4

#include <stdio.h>

int main()

{int c1,c2;

c1=197;

c2=198;

printf("c1=%c,c2=%c\n",c1,c2);

printf("c1=%d，c2=%d\n",c1,c2);

return 0;

}

3-5

#include <stdio.h>

int main()

{int a,b;

float x,y;

char c1,c2;

scanf("a=%d b=%d",&a,&b);

scanf("%f %e",&x,&y);

scanf("%c%c",&c1,&c2);

printf("a=%d,b=%d,x=%f,y=%f,c1=%c,c2=%c\n",a,b,x,y,c1,c2);

return 0;

}

3-6

#include <stdio.h>

int main()

{char c1='C',c2='h',c3='i',c4='n',c5='a';

c1=c1+4;

c2=c2+4;

c3=c3+4;

c4=c4+4;

c5=c5+4;

printf("passwor is %c%c%c%c%c\n",c1,c2,c3,c4,c5);

return 0;

}

3-7

#include <stdio.h>

int main ()

{float h,r,l,s,sq,vq,vz;

float pi=3.141526;

printf("请输入圆半径r，圆柱高h∶");

scanf("%f,%f",&r,&h); //要求输入圆半径r和圆柱高h

l=2\*pi\*r; //计算圆周长l

s=r\*r\*pi; //计算圆面积s

sq=4\*pi\*r\*r; //计算圆球表面积sq

vq=3.0/4.0\*pi\*r\*r\*r; //计算圆球体积vq

vz=pi\*r\*r\*h; //计算圆柱体积vz

printf("圆周长为: l=%6.2f\n",l);

printf("圆面积为: s=%6.2f\n",s);

printf("圆球表面积为: sq=%6.2f\n",sq);

printf("圆球体积为: v=%6.2f\n",vq);

printf("圆柱体积为: vz=%6.2f\n",vz);

return 0;

}

3-8-1

#include <stdio.h>

int main()

{

int c1,c2; //整型定义

printf("请输入两个整数c1,c2:");

scanf("%d,%d",&c1,&c2);

printf("按字符输出结果:\n");

printf("%c,%c\n",c1,c2);

printf("按ASCII码输出结果为:\n");

printf("%d,%d\n",c1,c2);

return 0;

}

3-8-2

#include <stdio.h>

int main()

{

char c1,c2; //定义字符型变量

int i1,i2; //定义整型变量

printf("请输入两个字符c1,c2:");

scanf("%c,%c",&c1,&c2);

i1=c1; //赋值给整型变量

i2=c2;

printf("按字符输出结果:\n");

printf("%c,%c\n",i1,i2);

printf("按整数输出结果:\n");

printf("%d,%d\n",c1,c2);

return 0;

}

3-8-3

#include <stdio.h>

int main()

{

char c1,c2; //定义为字符型

int i1,i2; //定义为整型

printf("请输入两个整数i1,i2:");

scanf("%d,%d",&i1,&i2);

c1=i1; //将整数赋值给字符变量

c2=i2;

printf("按字符输出结果:\n");

printf("%c,%c\n",c1,c2);

printf("按整数输出结果:\n");

printf("%d,%d\n",c1,c2);

return 0;

}

3-8

#include <stdio.h>

int main()

{

char c1,c2;

printf("请输入两个字符c1,c2:");

c1=getchar();

c2=getchar();

printf("用putchar语句输出结果为:");

putchar(c1);

putchar(c2);

printf("\n");

printf("用printf语句输出结果为:");

printf("%c %c\n",c1,c2);

return 0;

}

第4章选择结构程序设计85  
4.1选择结构和条件判断85  
4.2用if语句实现选择结构87  
4.2.1用if语句处理选择结构举例87  
4.2.2if语句的一般形式 89  
4.3关系运算符和关系表达式91  
4.3.1关系运算符及其优先次序91  
4.3.2关系表达式92  
4.4逻辑运算符和逻辑表达式92  
4.4.1逻辑运算符及其优先次序93  
4.4.2逻辑表达式94  
4.4.3逻辑型变量96  
4.5条件运算符和条件表达式97  
4.6选择结构的嵌套99  
4.7用switch语句实现多分支选择结构102  
4.8选择结构程序综合举例105  
习题111

4-4-1

#include <stdio.h>

int main()

{

int a,b,c;

printf("请输入三个整数:");

scanf("%d,%d,%d",&a,&b,&c);

if (a<b)

if (b<c)

printf("max=%d\n",c);

else

printf("max=%d\n",b);

else if (a<c)

printf("max=%d\n",c);

else

printf("max=%d\n",a);

return 0;

}

4-4-2

#include <stdio.h>

int main()

{ int a,b,c,temp,max;

printf("请输入三个整数:");

scanf("%d,%d,%d",&a,&b,&c);

temp=(a>b)?a:b; /\*将a和b中的大者存入temp中\*/

max=(temp>c)?temp:c; /\*将a和b中的大者与c比较,取最大者\*/

printf("三个整数的最大数是%d\n",max);

return 0;

}

4-5-2

#include <stdio.h>

#include <math.h>

#define M 1000

int main()

{

int i,k;

printf("请输入一个小于%d的整数i:",M);

scanf("%d",&i);

while (i>M)

{printf("输入的数不符合要求，请重新输入一个小于%d的整数i:",M);

scanf("%d",&i);

}

k=sqrt(i);

printf("%d的平方根的整数部分是：%d\n",i,k);

return 0;

}

4-5

#include <stdio.h>

#include <math.h>

#define M 1000

int main()

{

int i,k;

printf("请输入一个小于%d的整数i:",M);

scanf("%d",&i);

if (i>M)

{printf("输入的数不符合要求，请重新输入一个小于%d的整数i:",M);

scanf("%d",&i);

}

k=sqrt(i);

printf("%d的平方根的整数部分是：%d\n",i,k);

return 0;

}

4-6.

#include <stdio.h>

int main()

{ int x,y;

printf("输入x:");

scanf("%d",&x);

if(x<1) /\* x<1 \*/

{ y=x;

printf("x=%3d, y=x=%d\n" ,x,y);

}

else if(x<10) /\* 1=<x<10 \*/

{ y=2\*x-1;

printf("x=%d, y=2\*x-1=%d\n",x,y);

}

else /\* x>=10 \*/

{ y=3\*x-11;

printf("x=%d, y=3\*x-11=%d\n",x,y);

}

return 0;

}

4-7-1

#include <stdio.h>

int main()

{

int x,y;

printf("enter x:");

scanf("%d",&x);

y=-1;

if(x!=0)

if(x>0)

y=1;

else

y=0;

printf("x=%d,y=%d\n",x,y);

return 0;

}

4-7-2

#include <stdio.h>

int main()

{

int x,y;

printf("please enter x:");

scanf("%d",&x);

y=0;

if(x>=0)

if(x>0) y=1;

else y=-1;

printf("x=%d,y=%d\n",x,y);

return 0;

}

4-8

#include <stdio.h>

int main()

{ float score;

char grade;

printf("请输入学生成绩:");

scanf("%f",&score);

while (score>100||score<0)

{printf("\n 输入有误,请重输");

scanf("%f",&score);

}

switch((int)(score/10))

{case 10:

case 9: grade='A';break;

case 8: grade='B';break;

case 7: grade='C';break;

case 6: grade='D';break;

case 5:

case 4:

case 3:

case 2:

case 1:

case 0: grade='E';

}

printf("成绩是 %5.1f,相应的等级是%c\n ",score,grade);

return 0;

}

4-9

#include <stdio.h>

#include <math.h>

int main()

{

int num,indiv,ten,hundred,thousand,ten\_thousand,place; //分别代表个位,十位,百位,千位,万位和位数

printf("请输入一个整数(0-99999):");

scanf("%d",&num);

if (num>9999)

place=5;

else if (num>999)

place=4;

else if (num>99)

place=3;

else if (num>9)

place=2;

else place=1;

printf("位数:%d\n",place);

printf("每位数字为:");

ten\_thousand=num/10000;

thousand=(int)(num-ten\_thousand\*10000)/1000;

hundred=(int)(num-ten\_thousand\*10000-thousand\*1000)/100;

ten=(int)(num-ten\_thousand\*10000-thousand\*1000-hundred\*100)/10;

indiv=(int)(num-ten\_thousand\*10000-thousand\*1000-hundred\*100-ten\*10);

switch(place)

{case 5:printf("%d,%d,%d,%d,%d",ten\_thousand,thousand,hundred,ten,indiv);

printf("\n反序数字为:");

printf("%d%d%d%d%d\n",indiv,ten,hundred,thousand,ten\_thousand);

break;

case 4:printf("%d,%d,%d,%d",thousand,hundred,ten,indiv);

printf("\n反序数字为:");

printf("%d%d%d%d\n",indiv,ten,hundred,thousand);

break;

case 3:printf("%d,%d,%d",hundred,ten,indiv);

printf("\n反序数字为:");

printf("%d%d%d\n",indiv,ten,hundred);

break;

case 2:printf("%d,%d",ten,indiv);

printf("\n反序数字为:");

printf("%d%d\n",indiv,ten);

break;

case 1:printf("%d",indiv);

printf("\n反序数字为:");

printf("%d\n",indiv);

break;

}

return 0;

}

4-10-1

#include <stdio.h>

int main()

{

int i;

double bonus,bon1,bon2,bon4,bon6,bon10;

bon1=100000\*0.1;

bon2=bon1+100000\*0.075;

bon4=bon2+100000\*0.05;

bon6=bon4+100000\*0.03;

bon10=bon6+400000\*0.015;

printf("请输入利润i:");

scanf("%d",&i);

if (i<=100000)

bonus=i\*0.1;

else if (i<=200000)

bonus=bon1+(i-100000)\*0.075;

else if (i<=400000)

bonus=bon2+(i-200000)\*0.05;

else if (i<=600000)

bonus=bon4+(i-400000)\*0.03;

else if (i<=1000000)

bonus=bon6+(i-600000)\*0.015;

else

bonus=bon10+(i-1000000)\*0.01;

printf("奖金是: %10.2f\n",bonus);

return 0;

}

4-10-2

#include <stdio.h>

int main()

{

int i;

double bonus,bon1,bon2,bon4,bon6,bon10;

int branch;

bon1=100000\*0.1;

bon2=bon1+100000\*0.075;

bon4=bon2+200000\*0.05;

bon6=bon4+200000\*0.03;

bon10=bon6+400000\*0.015;

printf("请输入利润i:");

scanf("%d",&i);

branch=i/100000;

if (branch>10) branch=10;

switch(branch)

{ case 0:bonus=i\*0.1;break;

case 1:bonus=bon1+(i-100000)\*0.075;break;

case 2:

case 3: bonus=bon2+(i-200000)\*0.05;break;

case 4:

case 5: bonus=bon4+(i-400000)\*0.03;break;

case 6:

case 7:

case 8:

case 9: bonus=bon6+(i-600000)\*0.015;break;

case 10: bonus=bon10+(i-1000000)\*0.01;

}

printf("奖金是 %10.2f\n",bonus);

return 0;

}

4-11

#include <stdio.h>

int main()

{int t,a,b,c,d;

printf("请输入四个数:");

scanf("%d,%d,%d,%d",&a,&b,&c,&d);

printf("a=%d,b=%d,c=%d,d=%d\n",a,b,c,d);

if (a>b)

{ t=a;a=b;b=t;}

if (a>c)

{ t=a;a=c;c=t;}

if (a>d)

{ t=a;a=d;d=t;}

if (b>c)

{ t=b;b=c;c=t;}

if (b>d)

{ t=b;b=d;d=t;}

if (c>d)

{ t=c;c=d;d=t;}

printf("排序结果如下: \n");

printf("%d %d %d %d \n" ,a,b,c,d);

return 0;

}

4-12

#include <stdio.h>

int main()

{

int h=10;

float x1=2,y1=2,x2=-2,y2=2,x3=-2,y3=-2,x4=2,y4=-2,x,y,d1,d2,d3,d4;

printf("请输入一个点(x,y):");

scanf("%f,%f",&x,&y);

d1=(x-x4)\*(x-x4)+(y-y4)\*(y-y4); /\*求该点到各中心点距离\*/

d2=(x-x1)\*(x-x1)+(y-y1)\*(y-y1);

d3=(x-x2)\*(x-x2)+(y-y2)\*(y-y2);

d4=(x-x3)\*(x-x3)+(y-y3)\*(y-y3);

if (d1>1 && d2>1 && d3>1 && d4>1) h=0; /\*判断该点是否在塔外\*/

printf("该点高度为 %d\n",h);

return 0;

}

第5章循环结构程序设计114  
5.1为什么需要循环控制114  
5.2用while语句实现循环115  
5.3用do…while语句实现循环117  
5.4用for 语句实现循环120  
5.5循环的嵌套124  
5.6几种循环的比较125  
5.7改变循环执行的状态125  
5.7.1用break语句提前终止循环126  
5.7.2用continue语句提前结束本次循环127  
5.7.3break语句和continue语句的区别128  
5.8循环程序举例131  
习题140

5-2

#include <stdio.h>

#include <math.h> // 程序中用到数学函数fabs，应包含头文件math.n

int main()

{

int sign=1,count=0; // sign用来表示数值的符号,count用来统计循环次数

double pi=0.0,n=1.0,term=1.0; // pi开始代表多项式的值，最后代表π的值, n代表分母，term代表当前项的值

while(fabs(term)>=1e-8) // 检查当前项term的绝对值是否大于或等于10的(-6)次方

{

pi=pi+term; // 把当前项term累加到pi中

n=n+2; // n+2是下一项的分母

sign=-sign; // sign代表符号，下一项的符号与上一项符号相反

term=sign/n; // 求出下一项的值term

count++; // count累加1

}

pi=pi\*4; // 多项式的和pi乘以4，才是π的近似值

printf("pi=%10.8f\n",pi); // 输出π的近似值

printf("count=%d\n",count); // 输出循环次数

return 0;

}

5-3

#include <stdio.h>

int main()

{

int p,r,n,m,temp;

printf("请输入两个正整数n,m:");

scanf("%d,%d,",&n,&m);

if (n<m)

{

temp=n;

n=m;

m=temp;

}

p=n\*m;

while(m!=0)

{

r=n%m;

n=m;

m=r;

}

printf("它们的最大公约数为:%d\n",n);

printf("它们的最小公约数为:%d\n",p/n);

return 0;

}

5-4

#include <stdio.h>

int main()

{

char c;

int letters=0,space=0,digit=0,other=0;

printf("请输入一行字符:\n");

while((c=getchar())!='\n')

{

if (c>='a' && c<='z' || c>='A' && c<='Z')

letters++;

else if (c==' ')

space++;

else if (c>='0' && c<='9')

digit++;

else

other++;

}

printf("字母数:%d\n空格数:%d\n数字数:%d\n其它字符数:%d\n",letters,space,digit,other);

return 0;

}

5-5

#include <stdio.h>

int main()

{

int a,n,i=1,sn=0,tn=0;

printf("a,n=:");

scanf("%d,%d",&a,&n);

while (i<=n)

{

tn=tn+a; /\*赋值后的tn为i个 a组成数的值\*/

sn=sn+tn; /\*赋值后的sn为多项式前i项之和\*/

a=a\*10;

++i;

}

printf("a+aa+aaa+...=%d\n",sn);

return 0;

}

5-6

#include <stdio.h>

int main()

{double s=0,t=1;

int n;

for (n=1;n<=20;n++)

{

t=t\*n;

s=s+t;

}

printf("1!+2!+...+20!=%22.15e\n",s);

return 0;

}

5-7

#include <stdio.h>

int main()

{

int n1=100,n2=50,n3=10;

double k,s1=0,s2=0,s3=0;

for (k=1;k<=n1;k++) /\*计算1到100的和\*/

{s1=s1+k;}

for (k=1;k<=n2;k++) /\*计算1到50各数的平方和\*/

{s2=s2+k\*k;}

for (k=1;k<=n3;k++) /\*计算1到10的各倒数和\*/

{s3=s3+1/k;}

printf("sum=%15.6f\n",s1+s2+s3);

return 0;

}

5-8

#include <stdio.h>

int main()

{

int i,j,k,n;

printf("parcissus numbers are ");

for (n=100;n<1000;n++)

{

i=n/100;

j=n/10-i\*10;

k=n%10;

if (n==i\*i\*i + j\*j\*j + k\*k\*k)

printf("%d ",n);

}

printf("\n");

return 0;

}

5-9-1

#define M 1000 /\*定义寻找范围\*/

#include <stdio.h>

int main()

{

int k1,k2,k3,k4,k5,k6,k7,k8,k9,k10;

int i,a,n,s;

for (a=2;a<=M;a++) /\* a是2-1000之间的整数，检查它是否完数 \*/

{n=0; /\* n用来累计a的因子的个数 \*/

s=a; /\* s用来存放尚未求出的因子之和，开始时等于a \*/

for (i=1;i<a;i++) /\* 检查i是否a的因子 \*/

if (a%i==0) /\* 如果i是a的因子 \*/

{n++; /\* n加1，表示新找到一个因子 \*/

s=s-i; /\* s减去已找到的因子，s的新值是尚未求出的因子之和 \*/

switch(n) /\* 将找到的因子赋给k1...k9，或k10 \*/

{case 1:

k1=i; break; /\* 找出的笫1个因子赋给k1 \*/

case 2:

k2=i; break; /\* 找出的笫2个因子赋给k2 \*/

case 3:

k3=i; break; /\* 找出的笫3个因子赋给k3 \*/

case 4:

k4=i; break; /\* 找出的笫4个因子赋给k4 \*/

case 5:

k5=i; break; /\* 找出的笫5个因子赋给k5 \*/

case 6:

k6=i; break; /\* 找出的笫6个因子赋给k6 \*/

case 7:

k7=i; break; /\* 找出的笫7个因子赋给k7 \*/

case 8:

k8=i; break; /\* 找出的笫8个因子赋给k8 \*/

case 9:

k9=i; break; /\*找出的笫9个因子赋给k9 \*/

case 10:

k10=i; break; /\* 找出的笫10个因子赋给k10 \*/

}

}

if (s==0)

{

printf("%d ,Its factors are ",a);

if (n>1) printf("%d,%d",k1,k2); /\* n>1表示a至少有2个因子 \*/

if (n>2) printf(",%d",k3); /\* n>2表示至少有3个因子，故应再输出一个因子 \*/

if (n>3) printf(",%d",k4); /\* n>3表示至少有4个因子，故应再输出一个因子 \*/

if (n>4) printf(",%d",k5); /\* 以下类似 \*/

if (n>5) printf(",%d",k6);

if (n>6) printf(",%d",k7);

if (n>7) printf(",%d",k8);

if (n>8) printf(",%d",k9);

if (n>9) printf(",%d",k10);

printf("\n");

}

}

return 0;

}

5-9-2

#include <stdio.h>

int main()

{int m,s,i;

for (m=2;m<1000;m++)

{s=0;

for (i=1;i<m;i++)

if ((m%i)==0) s=s+i;

if(s==m)

{printf("%d,its factors are ",m);

for (i=1;i<m;i++)

if (m%i==0) printf("%d ",i);

printf("\n");

}

}

return 0;

}

5-10

#include <stdio.h>

int main()

{

int i,n=20;

double a=2,b=1,s=0,t;

for (i=1;i<=n;i++)

{

s=s+a/b;

t=a,

a=a+b,

b=t;

}

printf("sum=%16.10f\n",s);

return 0;

}

5-11

#include <stdio.h>

int main()

{

double sn=100,hn=sn/2;

int n;

for (n=2;n<=10;n++)

{

sn=sn+2\*hn; /\*第n次落地时共经过的米数\*/

hn=hn/2; /\*第n次反跳高度\*/

}

printf("第10次落地时共经过%f米\n",sn);

printf("第10次反弹%f米\n",hn);

return 0;

}

5-12

#include <stdio.h>

int main()

{

int day,x1,x2;

day=9;

x2=1;

while(day>0)

{x1=(x2+1)\*2; /\*第1天的桃子数是第2天桃子数加1后的2倍.\*/

x2=x1;

day--;

}

printf("total=%d\n",x1);

return 0;

}

5-13

#include <stdio.h>

#include <math.h>

int main()

{

float a,x0,x1;

printf("enter a positive number:");

scanf("%f",&a);

x0=a/2;

x1=(x0+a/x0)/2;

do

{x0=x1;

x1=(x0+a/x0)/2;

}while(fabs(x0-x1)>=1e-5);

printf("The square root of %5.2f is %8.5f\n",a,x1);

return 0;

}

5-14

#include <stdio.h>

#include <math.h>

int main()

{double x1,x0,f,f1;

x1=1.5;

do

{x0=x1;

f=((2\*x0-4)\*x0+3)\*x0-6;

f1=(6\*x0-8)\*x0+3;

x1=x0-f/f1;

}while(fabs(x1-x0)>=1e-5);

printf("The root of equation is %5.2f\n",x1);

return 0;

}

5-15

#include <stdio.h>

#include <math.h>

int main()

{float x0,x1,x2,fx0,fx1,fx2;

do

{printf("enter x1 & x2:");

scanf("%f,%f",&x1,&x2);

fx1=x1\*((2\*x1-4)\*x1+3)-6;

fx2=x2\*((2\*x2-4)\*x2+3)-6;

}while(fx1\*fx2>0);

do

{x0=(x1+x2)/2;

fx0=x0\*((2\*x0-4)\*x0+3)-6;

if ((fx0\*fx1)<0)

{x2=x0;

fx2=fx0;

}

else

{x1=x0;

fx1=fx0;

}

}while(fabs (fx0)>=1e-5);

printf("x=%6.2f\n",x0);

return 0;

}

5-16

#include <stdio.h>

int main()

{int i,j,k;

for (i=0;i<=3;i++)

{for (j=0;j<=2-i;j++)

printf(" ");

for (k=0;k<=2\*i;k++)

printf("\*");

printf("\n");

}

for (i=0;i<=2;i++)

{for (j=0;j<=i;j++)

printf(" ");

for (k=0;k<=4-2\*i;k++)

printf("\*");

printf("\n");

}

return 0;

}

5-17

#include <stdio.h>

int main()

{

char i,j,k; /\*是a的对手;j是b的对手;k是c的对手\*/

for (i='x';i<='z';i++)

for (j='x';j<='z';j++)

if (i!=j)

for (k='x';k<='z';k++)

if (i!=k && j!=k)

if (i!='x' && k!='x' && k!='z')

printf("A--%c\nB--%c\nC--%c\n",i,j,k);

return 0;

}

第6章利用数组处理批量数据142  
6.1怎样定义和引用一维数组142  
6.1.1怎样定义一维数组143  
6.1.2怎样引用一维数组元素144  
6.1.3一维数组的初始化145  
6.1.4一维数组程序举例146  
6.2怎样定义和引用二维数组148  
6.2.1怎样定义二维数组149  
6.2.2怎样引用二维数组的元素150  
6.2.3二维数组的初始化151  
6.2.4二维数组程序举例152  
6.3字符数组154  
6.3.1怎样定义字符数组154  
6.3.2字符数组的初始化155  
6.3.3怎样引用字符数组中的元素155  
6.3.4字符串和字符串结束标志156  
6.3.5字符数组的输入输出159  
6.3.6使用字符串处理函数161  
6.3.7字符数组应用举例165  
习题168

6-1

#include <stdio.h>

#include <math.h>

int main()

{int i,j,n,a[101];

for (i=1;i<=100;i++)

a[i]=i;

a[1]=0;

for (i=2;i<sqrt(100);i++)

for (j=i+1;j<=100;j++)

{if(a[i]!=0 && a[j]!=0)

if (a[j]%a[i]==0)

a[j]=0;

}

printf("\n");

for (i=2,n=0;i<=100;i++)

{ if(a[i]!=0)

{printf("%5d",a[i]);

n++;

}

if(n==10)

{printf("\n");

n=0;

}

}

printf("\n");

return 0;

}

6-2

#include <stdio.h>

int main()

{int i,j,min,temp,a[11];

printf("enter data:\n");

for (i=1;i<=10;i++)

{printf("a[%d]=",i);

scanf("%d",&a[i]);

}

printf("\n");

printf("The orginal numbers:\n");

for (i=1;i<=10;i++)

printf("%5d",a[i]);

printf("\n");

for (i=1;i<=9;i++)

{min=i;

for (j=i+1;j<=10;j++)

if (a[min]>a[j]) min=j;

temp=a[i];

a[i]=a[min];

a[min]=temp;

}

printf("\nThe sorted numbers:\n");

for (i=1;i<=10;i++)

printf("%5d",a[i]);

printf("\n");

return 0;

}

6-3

#include <stdio.h>

int main()

{

int a[3][3],sum=0;

int i,j;

printf("enter data:\n");

for (i=0;i<3;i++)

for (j=0;j<3;j++)

scanf("%3d",&a[i][j]);

for (i=0;i<3;i++)

sum=sum+a[i][i];

printf("sum=%6d\n",sum);

return 0;

}

6-4

#include <stdio.h>

int main()

{ int a[11]={1,4,6,9,13,16,19,28,40,100};

int temp1,temp2,number,end,i,j;

printf("array a:\n");

for (i=0;i<10;i++)

printf("%5d",a[i]);

printf("\n");

printf("insert data:");

scanf("%d",&number);

end=a[9];

if (number>end)

a[10]=number;

else

{for (i=0;i<10;i++)

{if (a[i]>number)

{temp1=a[i];

a[i]=number;

for (j=i+1;j<11;j++)

{temp2=a[j];

a[j]=temp1;

temp1=temp2;

}

break;

}

}

}

printf("Now array a:\n");

for (i=0;i<11;i++)

printf("%5d",a[i]);

printf("\n");

return 0;

}

6-5

#include <stdio.h>

#define N 5

int main()

{ int a[N],i,temp;

printf("enter array a:\n");

for (i=0;i<N;i++)

scanf("%d",&a[i]);

printf("array a:\n");

for (i=0;i<N;i++)

printf("%4d",a[i]);

for (i=0;i<N/2;i++) //循环的作用是将对称的元素的值互换

{ temp=a[i];

a[i]=a[N-i-1];

a[N-i-1]=temp;

}

printf("\nNow,array a:\n");

for (i=0;i<N;i++)

printf("%4d",a[i]);

printf("\n");

return 0;

}

6-6

#include <stdio.h>

#define N 10

int main()

{ int i,j,a[N][N];

for (i=0;i<N;i++)

{a[i][i]=1;

a[i][0]=1;

}

for (i=2;i<N;i++)

for (j=1;j<=i-1;j++)

a[i][j]=a[i-1][j-1]+a[i-1][j];

for (i=0;i<N;i++)

{for (j=0;j<=i;j++)

printf("%6d",a[i][j]);

printf("\n");

}

printf("\n");

return 0;

}

6-7

#include <stdio.h>

int main()

{ int a[15][15],i,j,k,p,n;

p=1;

while(p==1)

{printf("enter n(n=1--15):");

scanf("%d",&n);

if ((n!=0) && (n<=15) && (n%2!=0))

p=0;

}

for (i=1;i<=n;i++)

for (j=1;j<=n;j++)

a[i][j]=0;

j=n/2+1;

a[1][j]=1;

for (k=2;k<=n\*n;k++)

{i=i-1;

j=j+1;

if ((i<1) && (j>n))

{i=i+2;

j=j-1;

}

else

{if (i<1) i=n;

if (j>n) j=1;

}

if (a[i][j]==0)

a[i][j]=k;

else

{i=i+2;

j=j-1;

a[i][j]=k;

}

}

for (i=1;i<=n;i++)

{for (j=1;j<=n;j++)

printf("%5d",a[i][j]);

printf("\n");

}

return 0;

}

6-8

#include <stdio.h>

#define N 4

#define M 5 /\* 数组为4行5列 \*/

int main()

{

int i,j,k,a[N][M],max,maxj,flag;

printf("please input matrix:\n");

for (i=0;i<N;i++) /\* 输入数组 \*/

for (j=0;j<M;j++)

scanf("%d",&a[i][j]);

for (i=0;i<N;i++)

{max=a[i][0]; /\* 开始时假设a[i][0]最大 \*/

maxj=0; /\* 将列号0赋给maxj保存 \*/

for (j=0;j<M;j++) /\* 找出第i行中的最大数 \*/

if (a[i][j]>max)

{max=a[i][j]; /\* 将本行的最大数存放在max中 \*/

maxj=j; /\* 将最大数所在的列号存放在maxj中 \*/

}

flag=1; /\* 先假设是鞍点，以flag为1代表 \*/

for (k=0;k<N;k++)

if (max>a[k][maxj]) /\* 将最大数和其同列元素相比 \*/

{flag=0; /\* 如果max不是同列最小，表示不是鞍点令flag1为0 \*/

continue;}

if(flag) /\* 如果flag1为1表示是鞍点 \*/

{printf("a[%d][%d]=%d\n",i,maxj,max); /\* 输出鞍点的值和所在行列号 \*/

break;

}

}

if(!flag) /\* 如果flag为0表示鞍点不存在 \*/

printf("It is not exist!\n");

return 0;

}

6-9

#include <stdio.h>

#define N 15

int main()

{ int i,number,top,bott,mid,loca,a[N],flag=1,sign;

char c;

printf("enter data:\n");

scanf("%d",&a[0]);

i=1;

while(i<N)

{scanf("%d",&a[i]);

if (a[i]>=a[i-1])

i++;

else

printf("enter this data again:\n");

}

printf("\n");

for (i=0;i<N;i++)

printf("%5d",a[i]);

printf("\n");

while(flag)

{printf("input number to look for:");

scanf("%d",&number);

sign=0;

top=0; //top是查找区间的起始位置

bott=N-1; //bott是查找区间的最末位置

if ((number<a[0])||(number>a[N-1])) //要查的数不在查找区间内

loca=-1; // 表示找不到

while ((!sign) && (top<=bott))

{mid=(bott+top)/2;

if (number==a[mid])

{loca=mid;

printf("Has found %d, its position is %d\n",number,loca+1);

sign=1;

}

else if (number<a[mid])

bott=mid-1;

else

top=mid+1;

}

if(!sign||loca==-1)

printf("cannot find %d.\n",number);;

printf("continu or not(Y/N)?");

scanf(" %c",&c);

if (c=='N'||c=='n')

flag=0;

}

return 0;

}

6-10

#include <stdio.h>

int main()

{int i,j,upp,low,dig,spa,oth;

char text[3][80];

upp=low=dig=spa=oth=0;

for (i=0;i<3;i++)

{ printf("please input line %d:\n",i+1);

gets(text[i]);

for (j=0;j<80 && text[i][j]!='\0';j++)

{if (text[i][j]>='A'&& text[i][j]<='Z')

upp++;

else if (text[i][j]>='a' && text[i][j]<='z')

low++;

else if (text[i][j]>='0' && text[i][j]<='9')

dig++;

else if (text[i][j]==' ')

spa++;

else

oth++;

}

}

printf("\nupper case: %d\n",upp);

printf("lower case: %d\n",low);

printf("digit : %d\n",dig);

printf("space : %d\n",spa);

printf("other : %d\n",oth);

return 0;

}

6-11

#include <stdio.h>

int main()

{ char a[5]={'\*','\*','\*','\*','\*'};

int i,j,k;

char space=' ';

for (i=0;i<5;i++)

{ printf("\n");

printf(" ");

for (j=1;j<=i;j++)

printf("%c",space);

for (k=0;k<5;k++)

printf("%c",a[k]);

}

printf("\n");

return 0;

}

6-12a-c

#include <stdio.h>

int main()

{ int j,n;

char ch[80],tran[80];

printf("input cipher code:");

gets(ch);

printf("\ncipher code :%s",ch);

j=0;

while (ch[j]!='\0')

{ if ((ch[j]>='A') && (ch[j]<='Z'))

tran[j]=155-ch[j];

else if ((ch[j]>='a') && (ch[j]<='z'))

tran[j]=219-ch[j];

else

tran[j]=ch[j];

j++;

}

n=j;

printf("\noriginal text:");

for (j=0;j<n;j++)

putchar(tran[j]);

printf("\n");

return 0;

}

6-12b

#include <stdio.h>

int main()

{int j,n;

char ch[80];

printf("input cipher code:\n");

gets(ch);

printf("\ncipher code:%s\n",ch);

j=0;

while (ch[j]!='\0')

{ if ((ch[j]>='A') && (ch[j]<='Z'))

ch[j]=155-ch[j];

else if ((ch[j]>='a') && (ch[j]<='z'))

ch[j]=219-ch[j];

else

ch[j]=ch[j];

j++;

}

n=j;

printf("original text:");

for (j=0;j<n;j++)

putchar(ch[j]);

printf("\n");

return 0;

}

6-13

#include <stdio.h>

int main()

{ char s1[80],s2[40];

int i=0,j=0;

printf("input string1:");

scanf("%s",s1);

printf("input string2:");

scanf("%s",s2);

while (s1[i]!='\0')

i++;

while(s2[j]!='\0')

s1[i++]=s2[j++];

s1[i]='\0';

printf("\nThe new string is:%s\n",s1);

return 0;

}

6-14

#include <stdio.h>

int main()

{ int i,resu;

char s1[100],s2[100];

printf("input string1:");

gets(s1);

printf("\ninput string2:");

gets(s2);

i=0;

while ((s1[i]==s2[i]) && (s1[i]!='\0'))i++;

if (s1[i]=='\0' && s2[i]=='\0')

resu=0;

else

resu=s1[i]-s2[i];

printf("\nresult:%d.\n",resu);

return 0;

}

6-15

#include <stdio.h>

#include <string.h>

int main()

{ char s1[80],s2[80];

int i;

printf("input s2:");

scanf("%s",s2);

for (i=0;i<=strlen(s2);i++)

s1[i]=s2[i];

printf("s1:%s\n",s1);

return 0;

}

第7章用函数实现模块化程序设计170  
7.1为什么要用函数170  
7.2怎样定义函数172  
7.2.1为什么要定义函数172  
7.2.2定义函数的方法173  
7.3调用函数174  
7.3.1函数调用的形式174  
7.3.2函数调用时的数据传递175  
7.3.3函数调用的过程177  
7.3.4函数的返回值178  
7.4对被调用函数的声明和函数原型179  
7.5函数的嵌套调用182  
7.6函数的递归调用184  
7.7数组作为函数参数192  
7.7.1数组元素作函数实参193  
7.7.2数组名作函数参数194  
7.7.3多维数组名作函数参数197  
7.8局部变量和全局变量199  
7.8.1局部变量199  
7.8.2全局变量200  
7.9变量的存储方式和生存期204  
7.9.1动态存储方式与静态存储方式204  
7.9.2局部变量的存储类别205  
7.9.3全局变量的存储类别208  
7.9.4存储类别小结212  
7.10关于变量的声明和定义214  
7.11内部函数和外部函数215  
7.11.1内部函数215  
7.11.2外部函数215  
习题218

7-1-1

#include <stdio.h>

int main()

{int hcf(int,int);

int lcd(int,int,int);

int u,v,h,l;

scanf("%d,%d",&u,&v);

h=hcf(u,v);

printf("H.C.F=%d\n",h);

l=lcd(u,v,h);

printf("L.C.D=%d\n",l);

return 0;

}

int hcf(int u,int v)

{int t,r;

if (v>u)

{t=u;u=v;v=t;}

while ((r=u%v)!=0)

{u=v;

v=r;}

return(v);

}

int lcd(int u,int v,int h)

{

return(u\*v/h);

}

7-1-2

#include <stdio.h>

int Hcf,Lcd;

int main()

{void hcf(int,int);

void lcd(int,int);

int u,v;

scanf("%d,%d",&u,&v);

hcf(u,v);

lcd(u,v);

printf("H.C.F=%d\n",Hcf);

printf("L.C.D=%d\n",Lcd);

return 0;

}

void hcf(int u,int v)

{int t,r;

if (v>u)

{t=u;u=v;v=t;}

while ((r=u%v)!=0)

{u=v;

v=r;

}

Hcf=v;

}

void lcd(int u,int v)

{

Lcd=u\*v/Hcf;

}

7-2

#include <stdio.h>

#include <math.h>

float x1,x2,disc,p,q;

int main()

{void greater\_than\_zero(float,float);

void equal\_to\_zero(float,float);

void smaller\_than\_zero(float,float);

float a,b,c;

printf("input a,b,c:");

scanf("%f,%f,%f",&a,&b,&c);

printf("equation: %5.2f\*x\*x+%5.2f\*x+%5.2f=0\n",a,b,c);

disc=b\*b-4\*a\*c;

printf("root:\n");

if (disc>0)

{

greater\_than\_zero(a,b);

printf("x1=%f\t\tx2=%f\n",x1,x2);

}

else if (disc==0)

{equal\_to\_zero(a,b);

printf("x1=%f\t\tx2=%f\n",x1,x2);

}

else

{smaller\_than\_zero(a,b);

printf("x1=%f+%fi\tx2=%f-%fi\n",p,q,p,q);

}

return 0;

}

void greater\_than\_zero(float a,float b)

{x1=(-b+sqrt(disc))/(2\*a);

x2=(-b-sqrt(disc))/(2\*a);

}

void equal\_to\_zero(float a,float b)

{

x1=x2=(-b)/(2\*a);

}

void smaller\_than\_zero(float a,float b)

{

p=-b/(2\*a);

q=sqrt(-disc)/(2\*a);

}

7-3

#include <stdio.h>

int main()

{int prime(int);

int n;

printf("input an integer:");

scanf("%d",&n);

if (prime(n))

printf("%d is a prime.\n",n);

else

printf("%d is not a prime.\n",n);

return 0;

}

int prime(int n)

{int flag=1,i;

for (i=2;i<n/2 && flag==1;i++)

if (n%i==0)

flag=0;

return(flag);

}

7-4

#include <stdio.h>

#define N 3

int array[N][N];

int main()

{ void convert(int array[][3]);

int i,j;

printf("input array:\n");

for (i=0;i<N;i++)

for (j=0;j<N;j++)

scanf("%d",&array[i][j]);

printf("\noriginal array :\n");

for (i=0;i<N;i++)

{for (j=0;j<N;j++)

printf("%5d",array[i][j]);

printf("\n");

}

convert(array);

printf("convert array:\n");

for (i=0;i<N;i++)

{for (j=0;j<N;j++)

printf("%5d",array[i][j]);

printf("\n");

}

return 0;

}

void convert(int array[][3])

{int i,j,t;

for (i=0;i<N;i++)

for (j=i+1;j<N;j++)

{t=array[i][j];

array[i][j]=array[j][i];

array[j][i]=t;

}

}

#include <stdio.h>

#include <string.h>

int main()

{void inverse(char str[]);

char str[100];

printf("input string:");

scanf("%s",str);

inverse(str);

printf("inverse string:%s\n",str);

return 0;

}

void inverse(char str[])

{char t;

int i,j;

for (i=0,j=strlen(str);i<(strlen(str)/2);i++,j--)

{t=str[i];

str[i]=str[j-1];

str[j-1]=t;

}

}

7-6

#include <stdio.h>

int main()

{void concatenate(char string1[],char string2[],char string[]);

char s1[100],s2[100],s[100];

printf("input string1:");

scanf("%s",s1);

printf("input string2:");

scanf("%s",s2);

concatenate(s1,s2,s);

printf("\nThe new string is %s\n",s);

return 0;

}

void concatenate(char string1[],char string2[],char string[])

{int i,j;

for (i=0;string1[i]!='\0';i++)

string[i]=string1[i];

for(j=0;string2[j]!='\0';j++)

string[i+j]=string2[j];

string[i+j]='\0';

}

7-7

#include <stdio.h>

int main()

{void cpy(char [],char []);

char str[80],c[80];

printf("input string:");

gets(str);

cpy(str,c);

printf("The vowel letters are:%s\n",c);

return 0;

}

void cpy(char s[],char c[])

{ int i,j;

for (i=0,j=0;s[i]!='\0';i++)

if (s[i]=='a'||s[i]=='A'||s[i]=='e'||s[i]=='E'||s[i]=='i'||

s[i]=='I'||s[i]=='o'||s[i]=='O'||s[i]=='u'||s[i]=='U')

{c[j]=s[i];

j++;

}

c[j]='\0';

}

7-8

#include <stdio.h>

#include <string.h>

int main()

{char str[80];

void insert(char []);

printf("input four digits:");

scanf("%s",str);

insert(str);

return 0;

}

void insert(char str[])

{int i;

for (i=strlen(str);i>0;i--)

{str[2\*i]=str[i];

str[2\*i-1]=' ';

}

printf("output:\n%s\n",str);

}

7-9

#include <stdio.h>

int letter,digit,space,others;

int main()

{void count(char []);

char text[80];

printf("input string:\n");

gets(text);

printf("string:");

puts(text);

letter=0;

digit=0;

space=0;

others=0;

count(text);

printf("\nletter:%d\ndigit:%d\nspace:%d\nothers:%d\n",letter,digit,space,others);

return 0;

}

void count(char str[])

{int i;

for (i=0;str[i]!='\0';i++)

if ((str[i]>='a'&& str[i]<='z')||(str[i]>='A' && str[i]<='Z'))

letter++;

else if (str[i]>='0' && str [i]<='9')

digit++;

else if (str[i]==32)

space++;

else

others++;

}

7-10

#include <stdio.h>

#include <string.h>

int main()

{int alphabetic(char);

int longest(char []);

int i;

char line[100];

printf("input one line:\n");

gets(line);

printf("The longest word is :");

for (i=longest(line);alphabetic(line[i]);i++)

printf("%c",line[i]);

printf("\n");

return 0;

}

int alphabetic(char c)

{if ((c>='a' && c<='z')||(c>='A'&&c<='z'))

return(1);

else

return(0);

}

int longest(char string[])

{int len=0,i,length=0,flag=1,place=0,point;

for (i=0;i<=strlen(string);i++)

if (alphabetic(string[i]))

if (flag)

{point=i;

flag=0;

}

else

len++;

else

{flag=1;

if (len>=length)

{length=len;

place=point;

len=0;

}

}

return(place);

}

7-11

#include <stdio.h>

#include <string.h>

#define N 10

char str[N];

int main()

{void sort(char []);

int i,flag;

for (flag=1;flag==1;)

{printf("input string:\n");

scanf("%s",&str);

if (strlen(str)>N)

printf("string too long,input again!");

else

flag=0;

}

sort(str);

printf("string sorted:\n");

for (i=0;i<N;i++)

printf("%c",str[i]);

printf("\n");

return 0;

}

void sort(char str[])

{int i,j;

char t;

for(j=1;j<N;j++)

for (i=0;(i<N-j)&&(str[i]!='\0');i++)

if(str[i]>str[i+1])

{t=str[i];

str[i]=str[i+1];

str[i+1]=t;

}

}

7-12

#include <stdio.h>

#include <math.h>

int main()

{float solut(float a,float b,float c,float d);

float a,b,c,d;

printf("input a,b,c,d:");

scanf("%f,%f,%f,%f",&a,&b,&c,&d);

printf("x=%10.7f\n",solut(a,b,c,d));

return 0;

}

float solut(float a,float b,float c,float d)

{float x=1,x0,f,f1;

do

{x0=x;

f=((a\*x0+b)\*x0+c)\*x0+d;

f1=(3\*a\*x0+2\*b)\*x0+c;

x=x0-f/f1;

}

while(fabs(x-x0)>=1e-3);

return(x);

}

7-13

#include <stdio.h>

#define N 10

#define M 5

float score[N][M];

float a\_stu[N],a\_cour[M];

int r,c;

int main()

{ int i,j;

float h;

float s\_var(void);

float highest();

void input\_stu(void);

void aver\_stu(void);

void aver\_cour(void);

input\_stu();

aver\_stu();

aver\_cour();

printf("\n NO. cour1 cour2 cour3 cour4 cour5 aver\n");

for(i=0;i<N;i++)

{printf("\n NO %2d ",i+1);

for(j=0;j<M;j++)

printf("%8.2f",score[i][j]);

printf("%8.2f\n",a\_stu[i]);

}

printf("\naverage:");

for (j=0;j<M;j++)

printf("%8.2f",a\_cour[j]);

printf("\n");

h=highest();

printf("highest:%7.2f NO. %2d course %2d\n",h,r,c);

printf("variance %8.2f\n",s\_var());

return 0;

}

void input\_stu(void)

{int i,j;

for (i=0;i<N;i++)

{printf("\ninput score of student%2d:\n",i+1);

for (j=0;j<M;j++)

scanf("%f",&score[i][j]);

}

}

void aver\_stu(void)

{int i,j;

float s;

for (i=0;i<N;i++)

{for (j=0,s=0;j<M;j++)

s+=score[i][j];

a\_stu[i]=s/5.0;

}

}

void aver\_cour(void)

{int i,j;

float s;

for (j=0;j<M;j++)

{s=0;

for (i=0;i<N;i++)

s+=score[i][j];

a\_cour[j]=s/(float)N;

}

}

float highest()

{float high;

int i,j;

high=score[0][0];

for (i=0;i<N;i++)

for (j=0;j<M;j++)

if (score[i][j]>high)

{high=score[i][j];

r=i+1;

c=j+1;

}

return(high);

}

float s\_var(void)

{int i;

float sumx,sumxn;

sumx=0.0;

sumxn=0.0;

for (i=0;i<N;i++)

{sumx+=a\_stu[i]\*a\_stu[i];

sumxn+=a\_stu[i];

}

return(sumx/N-(sumxn/N)\*(sumxn/N));

}

7-\*14

#include <stdio.h>

#define N 10

#define M 5

float score[N][M];

float a\_stu[N],a\_cour[M];

int r,c;

int main()

{ int i,j;

float h;

float s\_var(void);

float highest();

void input\_stu(void);

void aver\_stu(void);

void aver\_cour(void);

input\_stu();

aver\_stu();

aver\_cour();

printf("\n NO. cour1 cour2 cour3 cour4 cour5 aver\n");

for(i=0;i<N;i++)

{printf("\n NO %2d ",i+1);

for(j=0;j<M;j++)

printf("%8.2f",score[i][j]);

printf("%8.2f\n",a\_stu[i]);

}

printf("\naverage:");

for (j=0;j<M;j++)

printf("%8.2f",a\_cour[j]);

printf("\n");

h=highest();

printf("highest:%7.2f NO. %2d course %2d\n",h,r,c);

printf("variance %8.2f\n",s\_var());

return 0;

}

void input\_stu(void)

{int i,j;

for (i=0;i<N;i++)

{printf("\ninput score of student%2d:\n",i+1);

for (j=0;j<M;j++)

scanf("%f",&score[i][j]);

}

}

void aver\_stu(void)

{int i,j;

float s;

for (i=0;i<N;i++)

{for (j=0,s=0;j<M;j++)

s+=score[i][j];

a\_stu[i]=s/5.0;

}

}

void aver\_cour(void)

{int i,j;

float s;

for (j=0;j<M;j++)

{s=0;

for (i=0;i<N;i++)

s+=score[i][j];

a\_cour[j]=s/(float)N;

}

}

float highest()

{float high;

int i,j;

high=score[0][0];

for (i=0;i<N;i++)

for (j=0;j<M;j++)

if (score[i][j]>high)

{high=score[i][j];

r=i+1;

c=j+1;

}

return(high);

}

float s\_var(void)

{int i;

float sumx,sumxn;

sumx=0.0;

sumxn=0.0;

for (i=0;i<N;i++)

{sumx+=a\_stu[i]\*a\_stu[i];

sumxn+=a\_stu[i];

}

return(sumx/N-(sumxn/N)\*(sumxn/N));

}

7-15

#include <stdio.h>

#include <string.h>

#define N 10

int main()

{void input(int [],char name[][8]);

void sort(int [],char name[][8]);

void search(int ,int [],char name[][8]);

int num[N],number,flag=1,c;

char name[N][8];

input(num,name);

sort(num,name);

while (flag==1)

{printf("\ninput number to look for:");

scanf("%d",&number);

search(number,num,name);

printf("continue ot not(Y/N)?");

getchar();

c=getchar();

if (c=='N'||c=='n')

flag=0;

}

return 0;

}

void input(int num[],char name[N][8])

{int i;

for (i=0;i<N;i++)

{printf("input NO.: ");

scanf("%d",&num[i]);

printf("input name: ");

getchar();

gets(name[i]);

}

}

void sort(int num[],char name[N][8])

{ int i,j,min,templ;

char temp2[8];

for (i=0;i<N-1;i++)

{min=i;

for (j=i;j<N;j++)

if (num[min]>num[j]) min=j;

templ=num[i];

strcpy(temp2,name[i]);

num[i]=num[min];

strcpy (name[i],name[min]);

num[min]=templ;

strcpy(name[min],temp2);

}

printf("\n result:\n");

for (i=0;i<N;i++)

printf("\n %5d%10s",num[i],name[i]);

}

void search(int n,int num[],char name[N][8])

{int top,bott,mid,loca,sign;

top=0;

bott=N-1;

loca=0;

sign=1;

if ((n<num[0])||(n>num[N-1]))

loca=-1;

while((sign==1) && (top<=bott))

{mid=(bott+top)/2;

if (n==num[mid])

{loca=mid;

printf("NO. %d , his name is %s.\n",n,name[loca]);

sign=-1;

}

else if (n<num[mid])

bott=mid-1;

else

top=mid+1;

}

if (sign==1 || loca==-1)

printf("%d not been found.\n",n);

}

7-16

#include <stdio.h>

#define MAX 1000

int main()

{ int htoi(char s[]);

int c,i,flag,flag1;

char t[MAX];

i=0;

flag=0;

flag1=1;

printf("input a HEX number:");

while((c=getchar())!='\0' && i<MAX&& flag1)

{if (c>='0' && c<='9'||c>='a' && c<='f'||c>='A' && c<='F')

{flag=1;

t[i++]=c;

}

else if (flag)

{t[i]='\0';

printf("decimal number %d\n",htoi(t));

printf("continue or not?");

c=getchar();

if (c=='N'||c=='n')

flag1=0;

else

{flag=0;

i=0;

printf("\ninput a HEX number:");

}

}

}

return 0;

}

int htoi(char s[])

{ int i,n;

n=0;

for (i=0;s[i]!='\0';i++)

{if (s[i]>='0'&& s[i]<='9')

n=n\*16+s[i]-'0';

if (s[i]>='a' && s[i]<='f')

n=n\*16+s[i]-'a'+10;

if (s[i]>='A' && s[i]<='F')

n=n\*16+s[i]-'A'+10;

}

return(n);

}

7-17

#include <stdio.h>

int main()

{ void convert(int n);

int number;

printf("input an integer: ");

scanf("%d",&number);

printf("output: ");

if (number<0)

{putchar('-');putchar(' '); /\* 先输出一个‘-’号和空格 \*/

number=-number;

}

convert(number);

printf("\n");

return 0;

}

void convert(int n)

{ int i;

if ((i=n/10)!=0)

convert(i);

putchar(n%10+'0');

putchar(32);

}

7-18

#include <stdio.h>

int main()

{int sum\_day(int month,int day);

int leap(int year);

int year,month,day,days;

printf("input date(year,month,day):");

scanf("%d,%d,%d",&year,&month,&day);

printf("%d/%d/%d ",year,month,day);

days=sum\_day(month,day); /\* 调用函数sum\_day \*/

if(leap(year)&&month>=3) /\* 调用函数leap \*/

days=days+1;

printf("is the %dth day in this year.\n",days);

return 0;

}

int sum\_day(int month,int day) /\* 函数sum\_day:计算日期 \*/

{int day\_tab[13]={0,31,28,31,30,31,30,31,31,30,31,30,31};

int i;

for (i=1;i<month;i++)

day+=day\_tab[i]; /\* 累加所在月之前天数 \*/

return(day);

} /\* 函数leap:判断是否为闰年 \*/

int leap(int year)

{int leap;

leap=year%4==0&&year%100!=0||year%400==0;

return(leap);

}

第8章善于利用指针220  
8.1指针是什么220  
8.2指针变量222  
8.2.1使用指针变量的例子222  
8.2.2怎样定义指针变量223  
8.2.3怎样引用指针变量224  
8.2.4指针变量作为函数参数226  
8.3通过指针引用数组230  
8.3.1数组元素的指针230  
8.3.2在引用数组元素时指针的运算231  
8.3.3通过指针引用数组元素233  
8.3.4用数组名作函数参数237  
8.3.5通过指针引用多维数组245  
8.4通过指针引用字符串255  
8.4.1字符串的引用方式 255  
8.4.2字符指针作函数参数259  
8.4.3使用字符指针变量和字符数组的比较263  
8.5指向函数的指针266  
8.5.1什么是函数指针266  
8.5.2用函数指针变量调用函数266  
8.5.3怎样定义和使用指向函数的指针变量268  
8.5.4用指向函数的指针作函数参数270  
8.6返回指针值的函数274  
8.7指针数组和多重指针277  
8.7.1什么是指针数组 277  
8.7.2指向指针数据的指针280  
8.7.3指针数组作main函数的形参282  
8.8动态内存分配与指向它的指针变量285  
8.8.1什么是内存的动态分配285  
8.8.2怎样建立内存的动态分配285  
8.8.3void指针类型 287  
8.9有关指针的小结288  
习题291

8-1

#include <stdio.h>

int main()

{ void swap(int \*p1,int \*p2);

int n1,n2,n3;

int \*p1,\*p2,\*p3;

printf("input three integer n1,n2,n3:");

scanf("%d,%d,%d",&n1,&n2,&n3);

p1=&n1;

p2=&n2;

p3=&n3;

if(n1>n2) swap(p1,p2);

if(n1>n3) swap(p1,p3);

if(n2>n3) swap(p2,p3);

printf("Now,the order is:%d,%d,%d\n",n1,n2,n3);

return 0;

}

void swap(int \*p1,int \*p2)

{int p;

p=\*p1; \*p1=\*p2; \*p2=p;

}

#include <stdio.h>

#include <string.h>

int main()

{void swap(char \*,char \*);

char str1[20],str2[20],str3[20];

printf("input three line:\n");

gets(str1);

gets(str2);

gets(str3);

if(strcmp(str1,str2)>0) swap(str1,str2);

if(strcmp(str1,str3)>0) swap(str1,str3);

if(strcmp(str2,str3)>0) swap(str2,str3);

printf("Now,the order is:\n");

printf("%s\n%s\n%s\n",str1,str2,str3);

return 0;

}

void swap(char \*p1,char \*p2)

{char p[20];

strcpy(p,p1);strcpy(p1,p2);strcpy(p2,p);

}

8-3

#include <stdio.h>

int main()

{ void input(int \*);

void max\_min\_value(int \*);

void output(int \*);

int number[10];

input(number);

max\_min\_value(number);

output(number);

return 0;

}

void input(int \*number)

{int i;

printf("input 10 numbers:");

for (i=0;i<10;i++)

scanf("%d",&number[i]);

}

void max\_min\_value(int \*number)

{ int \*max,\*min,\*p,temp;

max=min=number;

for (p=number+1;p<number+10;p++)

if (\*p>\*max) max=p;

else if (\*p<\*min) min=p;

temp=number[0];number[0]=\*min;\*min=temp;

if(max==number) max=min;

temp=number[9];number[9]=\*max;\*max=temp;

}

void output(int \*number)

{int \*p;

printf("Now,they are: ");

for (p=number;p<number+10;p++)

printf("%d ",\*p);

printf("\n");

}

8-4

#include <stdio.h>

int main()

{void move(int [20],int,int);

int number[20],n,m,i;

printf("how many numbers?");

scanf("%d",&n);

printf("input %d numbers:\n",n);

for (i=0;i<n;i++)

scanf("%d",&number[i]);

printf("how many place you want move?");

scanf("%d",&m);

move(number,n,m);

printf("Now,they are:\n");

for (i=0;i<n;i++)

printf("%d ",number[i]);

printf("\n");

return 0;

}

void move(int array[20],int n,int m)

{int \*p,array\_end;

array\_end=\*(array+n-1);

for (p=array+n-1;p>array;p--)

\*p=\*(p-1);

\*array=array\_end;

m--;

if (m>0) move(array,n,m);

}

8-5

#include <stdio.h>

int main()

{int i,k,m,n,num[50],\*p;

printf("\ninput number of person: n=");

scanf("%d",&n);

p=num;

for (i=0;i<n;i++)

\*(p+i)=i+1;

i=0;

k=0;

m=0;

while (m<n-1)

{if (\*(p+i)!=0) k++;

if (k==3)

{\*(p+i)=0;

k=0;

m++;

}

i++;

if (i==n) i=0;

}

while(\*p==0) p++;

printf("The last one is NO.%d\n",\*p);

return 0;

}

8-6

#include <stdio.h>

int main()

{int length(char \*p);

int len;

char str[20];

printf("input string: ");

scanf("%s",str);

len=length(str);

printf("The length of string is %d.\n",len);

return 0;

}

int length(char \*p)

{int n;

n=0;

while (\*p!='\0')

{n++;

p++;

}

return(n);

}

8-7

#include <stdio.h>

#include <string.h>

int main()

{void copystr(char \*,char \*,int);

int m;

char str1[20],str2[20];

printf("input string:");

gets(str1);

printf("which character that begin to copy?");

scanf("%d",&m);

if (strlen(str1)<m)

printf("input error!");

else

{copystr(str1,str2,m);

printf("result:%s\n",str2);

}

return 0;

}

void copystr(char \*p1,char \*p2,int m)

{int n;

n=0;

while (n<m-1)

{n++;

p1++;

}

while (\*p1!='\0')

{\*p2=\*p1;

p1++;

p2++;

}

\*p2='\0';

}

8-8

#include <stdio.h>

int main()

{int upper=0,lower=0,digit=0,space=0,other=0,i=0;

char \*p,s[20];

printf("input string: ");

while ((s[i]=getchar())!='\n') i++;

p=&s[0];

while (\*p!='\n')

{if (('A'<=\*p) && (\*p<='Z'))

++upper;

else if (('a'<=\*p) && (\*p<='z'))

++lower;

else if (\*p==' ')

++space;

else if ((\*p<='9') && (\*p>='0'))

++digit;

else

++other;

p++;

}

printf("upper case:%d lower case:%d",upper,lower);

printf(" space:%d digit:%d other:%d\n",space,digit,other);

return 0;

}

8-9

#include <stdio.h>

int main()

{void move(int \*pointer);

int a[3][3],\*p,i;

printf("input matrix:\n");

for (i=0;i<3;i++)

scanf("%d %d %d",&a[i][0],&a[i][1],&a[i][2]);

p=&a[0][0];

move(p);

printf("Now,matrix:\n");

for (i=0;i<3;i++)

printf("%d %d %d\n",a[i][0],a[i][1],a[i][2]);

return 0;

}

void move(int \*pointer)

{int i,j,t;

for (i=0;i<3;i++)

for (j=i;j<3;j++)

{t=\*(pointer+3\*i+j);

\*(pointer+3\*i+j)=\*(pointer+3\*j+i);

\*(pointer+3\*j+i)=t;

}

}

8-10-1

#include <stdio.h>

int main()

{void change(int \*p);

int a[5][5],\*p,i,j;

printf("input matrix:\n");

for (i=0;i<5;i++)

for (j=0;j<5;j++)

scanf("%d",&a[i][j]);

p=&a[0][0];

change(p);

printf("Now,matrix:\n");

for (i=0;i<5;i++)

{for (j=0;j<5;j++)

printf("%d ",a[i][j]);

printf("\n");

}

return 0;

}

void change(int \*p)

{int i,j,temp;

int \*pmax,\*pmin;

pmax=p;

pmin=p;

for (i=0;i<5;i++)

for (j=i;j<5;j++)

{if (\*pmax<\*(p+5\*i+j)) pmax=p+5\*i+j;

if (\*pmin>\*(p+5\*i+j)) pmin=p+5\*i+j;

}

temp=\*(p+12);

\*(p+12)=\*pmax;

\*pmax=temp;

temp=\*p;

\*p=\*pmin;

\*pmin=temp;

pmin=p+1;

for (i=0;i<5;i++)

for (j=0;j<5;j++)

if (((p+5\*i+j)!=p) && (\*pmin>\*(p+5\*i+j))) pmin=p+5\*i+j;

temp=\*pmin;

\*pmin=\*(p+4);

\*(p+4)=temp;

pmin=p+1;

for (i=0;i<5;i++)

for (j=0;j<5;j++)

if (((p+5\*i+j)!=(p+4))&&((p+5\*i+j)!=p)&&(\*pmin>\*(p+5\*i+j)))pmin=p+5\*i+j;

temp=\*pmin;

\*pmin=\*(p+20);

\*(p+20)=temp;

pmin=p+1;

for (i=0;i<5;i++)

for (j=0;j<5;j++)

if (((p+5\*i+j)!=p) && ((p+5\*i+j)!=(p+4)) && ((p+5\*i+j)!=(p+20)) && (\*pmin>\*(p+5\*i+j)))

pmin=p+5\*i+j;

temp=\*pmin;

\*pmin=\*(p+24);

\*(p+24)=temp;

}

8-10-2

#include <stdio.h>

int main()

{void change(int \*p);

int a[5][5],\*p,i,j;

printf("input matrix:\n");

for (i=0;i<5;i++)

for (j=0;j<5;j++)

scanf("%d",&a[i][j]);

p=&a[0][0];

change(p);

printf("Now,matrix:\n");

for (i=0;i<5;i++)

{for (j=0;j<5;j++)

printf("%d ",a[i][j]);

printf("\n");

}

return 0;

}

void change(int \*p) //交换函数

{int i,j,temp;

int \*pmax,\*pmin;

pmax=p;

pmin=p;

for (i=0;i<5;i++) //找最大值和最小值的地址,并赋给 pmax,pmin

for (j=i;j<5;j++)

{if (\*pmax<\*(p+5\*i+j)) pmax=p+5\*i+j;

if (\*pmin>\*(p+5\*i+j)) pmin=p+5\*i+j;

}

temp=\*(p+12); //将最大值与中心元素互换

\*(p+12)=\*pmax;

\*pmax=temp;

temp=\*p; //将最小值与左上角元素互换

\*p=\*pmin;

\*pmin=temp;

pmin=p+1;

//将a[0][1]的地址赋给pmin，从该位置开始找最小的元素

for (i=0;i<5;i++) //找第二最小值的地址赋给 pmin

for (j=0;j<5;j++)

{if(i==0 && j==0) continue;

if (\*pmin > \*(p+5\*i+j)) pmin=p+5\*i+j;

}

temp=\*pmin; //将第二最小值与右上角元素互换

\*pmin=\*(p+4);

\*(p+4)=temp;

pmin=p+1;

for (i=0;i<5;i++) //找第三最小值的地址赋给pmin

for (j=0;j<5;j++)

{if((i==0 && j==0) ||(i==0 && j==4)) continue;

if(\*pmin>\*(p+5\*i+j)) pmin=p+5\*i+j;

}

temp=\*pmin; // 将第三最小值与左下角元素互换

\*pmin=\*(p+20);

\*(p+20)=temp;

pmin=p+1;

for (i=0;i<5;i++) // 找第四最小值的地址赋给pmin

for (j=0;j<5;j++)

{if ((i==0 && j==0) ||(i==0 && j==4)||(i==4 && j==0)) continue;

if (\*pmin>\*(p+5\*i+j)) pmin=p+5\*i+j;

}

temp=\*pmin; //将第四最小值与右下角元素互换

\*pmin=\*(p+24);

\*(p+24)=temp;

}

8-11-1

#include <stdio.h>

#include <string.h>

int main()

{void sort(char s[][6]);

int i;

char str[10][6];

printf("input 10 strings:\n");

for (i=0;i<10;i++)

scanf("%s",str[i]);

sort(str);

printf("Now,the sequence is:\n");

for (i=0;i<10;i++)

printf("%s\n",str[i]);

return 0;

}

void sort(char s[10][6])

{int i,j;

char \*p,temp[10];

p=temp;

for (i=0;i<9;i++)

for (j=0;j<9-i;j++)

if (strcmp(s[j],s[j+1])>0)

{strcpy(p,s[j]);

strcpy(s[j],s[+j+1]);

strcpy(s[j+1],p);

}

}

8-11-2

#include <stdio.h>

#include <string.h>

int main()

{void sort(char (\*p)[6]);

int i;

char str[10][6];

char (\*p)[6];

printf("input 10 strings:\n");

for (i=0;i<10;i++)

scanf("%s",str[i]);

p=str;

sort(p);

printf("Now,the sequence is:\n");

for (i=0;i<10;i++)

printf("%s\n",str[i]);

return 0;

}

void sort(char (\*s)[6])

{int i,j;

char temp[6],\*t=temp;

for (i=0;i<9;i++)

for (j=0;j<9-i;j++)

if (strcmp(s[j],s[j+1])>0)

{strcpy(t,s[j]);

strcpy(s[j],s[+j+1]);

strcpy(s[j+1],t);

}

}

8-12

#include <stdio.h>

#include <string.h>

int main()

{void sort(char \*[]);

int i;

char \*p[10],str[10][20];

for (i=0;i<10;i++)

p[i]=str[i];

printf("input 10 strings:\n");

for (i=0;i<10;i++)

scanf("%s",p[i]);

sort(p);

printf("Now,the sequence is:\n");

for (i=0;i<10;i++)

printf("%s\n",p[i]);

return 0;

}

void sort(char \*s[])

{int i,j;

char \*temp;

for (i=0;i<9;i++)

for (j=0;j<9-i;j++)

if (strcmp(\*(s+j),\*(s+j+1))>0)

{temp=\*(s+j);

\*(s+j)=\*(s+j+1);

\*(s+j+1)=temp;

}

}

8-13

#include<stdio.h>

#include<math.h>

int main()

{float integral(float(\*)(float),float,float,int);//对integarl函数的声明

float fsin(float); //对fsin函数的声明

float fcos(float); //对fcos函数的声明

float fexp(float); //对fexp函数的声明

float a1,b1,a2,b2,a3,b3,c,(\*p)(float);

int n=20;

printf("input a1,b1:");

scanf("%f,%f",&a1,&b1);

printf("input a2,b2:");

scanf("%f,%f",&a2,&b2);

printf("input a3,b3:");

scanf("%f,%f",&a3,&b3);

p=fsin;

c=integral(p,a1,b1,n);

printf("The integral of sin(x) is:%f\n",c);

p=fcos;

c=integral(p,a2,b2,n);

printf("The integral of cos(x) is:%f\n",c);

p=fexp;

c=integral(p,a3,b3,n);

printf("The integral of exp(x) is:%f\n",c);

return 0;

}

float integral(float(\*p)(float),float a,float b,int n)

{int i;

float x,h,s;

h=(b-a)/n;

x=a;

s=0;

for(i=1;i<=n;i++)

{x=x+h;

s=s+(\*p)(x)\*h;

}

return(s);

}

float fsin(float x)

{return sin(x);}

float fcos(float x)

{return cos(x);}

float fexp(float x)

{return exp(x);}

8-14

#include <stdio.h>

int main()

{void sort (char \*p,int m);

int i,n;

char \*p,num[20];

printf("input n:");

scanf("%d",&n);

printf("please input these numbers:\n");

for (i=0;i<n;i++)

scanf("%d",&num[i]);

p=&num[0];

sort(p,n);

printf("Now,the sequence is:\n");

for (i=0;i<n;i++)

printf("%d ",num[i]);

printf("\n");

return 0;

}

void sort (char \*p,int m) // 将n个数逆序排列函数

{int i;

char temp, \*p1,\*p2;

for (i=0;i<m/2;i++)

{p1=p+i;

p2=p+(m-1-i);

temp=\*p1;

\*p1=\*p2;

\*p2=temp;

}

}

8-15

#include <stdio.h>

int main()

{void avsco(float \*,float \*);

void avcour1(char (\*)[10],float \*);

void fali2(char course[5][10],int num[],float \*pscore,float aver[4]);

void good(char course[5][10],int num[4],float \*pscore,float aver[4]);

int i,j,\*pnum,num[4];

float score[4][5],aver[4],\*pscore,\*paver;

char course[5][10],(\*pcourse)[10];

printf("input course:\n");

pcourse=course;

for (i=0;i<5;i++)

scanf("%s",course[i]);

printf("input NO. and scores:\n");

printf("NO.");

for (i=0;i<5;i++)

printf(",%s",course[i]);

printf("\n");

pscore=&score[0][0];

pnum=&num[0];

for (i=0;i<4;i++)

{scanf("%d",pnum+i);

for (j=0;j<5;j++)

scanf("%f",pscore+5\*i+j);

}

paver=&aver[0];

printf("\n\n");

avsco(pscore,paver); // 求出每个学生的平均成绩

avcour1(pcourse,pscore); // 求出第一门课的平均成绩

printf("\n\n");

fali2(pcourse,pnum,pscore,paver); // 找出2门课不及格的学生

printf("\n\n");

good(pcourse,pnum,pscore,paver); // 找出成绩好的学生

return 0;

}

void avsco(float \*pscore,float \*paver) // 求每个学生的平均成绩的函数

{int i,j;

float sum,average;

for (i=0;i<4;i++)

{sum=0.0;

for (j=0;j<5;j++)

sum=sum+(\*(pscore+5\*i+j)); //累计每个学生的各科成绩

average=sum/5; //计算平均成绩

\*(paver+i)=average;

}

}

void avcour1(char (\*pcourse)[10],float \*pscore) // 求第一课程的平均成绩的函数

{int i;

float sum,average1;

sum=0.0;

for (i=0;i<4;i++)

sum=sum+(\*(pscore+5\*i)); //累计每个学生的得分

average1=sum/4; //计算平均成绩

printf("course 1:%s average score:%7.2f\n",\*pcourse,average1);

}

void fali2(char course[5][10],int num[],float \*pscore,float aver[4])

// 找两门以上课程不及格的学生的函数

{int i,j,k,labe1;

printf(" ==========Student who is fail in two courses======= \n");

printf("NO. ");

for (i=0;i<5;i++)

printf("%11s",course[i]);

printf(" average\n");

for (i=0;i<4;i++)

{labe1=0;

for (j=0;j<5;j++)

if (\*(pscore+5\*i+j)<60.0) labe1++;

if (labe1>=2)

{printf("%d",num[i]);

for (k=0;k<5;k++)

printf("%11.2f",\*(pscore+5\*i+k));

printf("%11.2f\n",aver[i]);

}

}

}

void good(char course[5][10],int num[4],float \*pscore,float aver[4])

// 找成绩优秀学生(各门85以上或平均90分以上)的函数

{int i,j,k,n;

printf(" ======Students whose score is good======\n");

printf("NO. ");

for (i=0;i<5;i++)

printf("%11s",course[i]);

printf(" average\n");

for (i=0;i<4;i++)

{n=0;

for (j=0;j<5;j++)

if (\*(pscore+5\*i+j)>85.0) n++;

if ((n==5)||(aver[i]>=90))

{printf("%d",num[i]);

for (k=0;k<5;k++)

printf("%11.2f",\*(pscore+5\*i+k));

printf("%11.2f\n",aver[i]);

}

}

}

8-16

#include <stdio.h>

int main()

{

char str[50],\*pstr;

int i,j,k,m,e10,digit,ndigit,a[10],\*pa;

printf("input a string:\n");

gets(str);

pstr=&str[0]; /\*字符指针pstr置于数组str 首地址\*/

pa=&a[0]; /\*指针pa置于a数组首地址\*/

ndigit=0; /\*ndigit代表有多少个整数\*/

i=0; /\*代表字符串中的第几个字符\*/

j=0;

while(\*(pstr+i)!='\0')

{if((\*(pstr+i)>='0') && (\*(pstr+i)<='9'))

j++;

else

{if (j>0)

{digit=\*(pstr+i-1)-48; /\*将个数位赋予digit\*/

k=1;

while (k<j) /\*将含有两位以上数的其它位的数值累计于digit\*/

{e10=1;

for (m=1;m<=k;m++)

e10=e10\*10; /\*e10代表该位数所应乘的因子\*/

digit=digit+(\*(pstr+i-1-k)-48)\*e10; /\*将该位数的数值\累加于digit\*/

k++; /\*位数K自增\*/

}

\*pa=digit; /\*将数值赋予数组a\*/

ndigit++;

pa++; /\*指针pa指向a数组下一元素\*/

j=0;

}

}

i++;

}

if (j>0) /\*以数字结尾字符串的最后一个数据\*/

{digit=\*(pstr+i-1)-48; /\*将个数位赋予digit\*/

k=1;

while (k<j) /\* 将含有两位以上数的其它位的数值累加于digit\*/

{e10=1;

for (m=1;m<=k;m++)

e10=e10\*10; /\*e10代表位数所应乘的因子\*/

digit=digit+(\*(pstr+i-1-k)-48)\*e10; /\*将该位数的数值累加于digit\*/

k++; /\*位数K自增\*/

}

\*pa=digit; /\*将数值赋予数组a\*/

ndigit++;

j=0;

}

printf("There are %d numbers in this line, they are:\n",ndigit);

j=0;

pa=&a[0];

for (j=0;j<ndigit;j++) /\*打印数据\*/

printf("%d ",\*(pa+j));

printf("\n");

return 0;

}

8-17

#include<stdio.h>

int main()

{int strcmp(char \*p1,char \*p2);

int m;

char str1[20],str2[20],\*p1,\*p2;

printf("input two strings:\n");

scanf("%s",str1);

scanf("%s",str2);

p1=&str1[0];

p2=&str2[0];

m=strcmp(p1,p2);

printf("result:%d,\n",m);

return 0;

}

int strcmp(char \*p1,char \*p2) //两个字符串比较函数

{int i;

i=0;

while(\*(p1+i)==\*(p2+i))

if (\*(p1+i++)=='\0') return(0); //相等时返回结果0

return(\*(p1+i)-\*(p2+i)); //不等时返回结果为第一个不等字符ASCII码的差值

}

8-18

#include <stdio.h>

int main()

{char \*month\_name[13]={"illegal month","January","February","March","April",

"May","June","july","August","September","October", "November","December"};

int n;

printf("input month:\n");

scanf("%d",&n);

if ((n<=12) && (n>=1))

printf("It is %s.\n",\*(month\_name+n));

else

printf("It is wrong.\n");

return 0;

}

8-19-1

#include <stdio.h>

#define NEWSIZE 1000 //指定开辟存区的最大容量

char newbuf[NEWSIZE]; //定义字符数组newbuf

char \*newp=newbuf; //定义指针变量newp，指向可存区的始端

char \*new(int n) //定义开辟存区的函数new,开辟存储区后返回指针

{if (newp+n<=newbuf+NEWSIZE) // 开辟区未超过newbuf数组的大小

{newp+=n; // newp指向存储区的末尾

return(newp-n); // 返回一个指针,它指向存区的开始位置

}

else

return(NULL); // 当存区不够分配时,返回一个空指针

}

8-19-2

#include <stdio.h>

#define NEWSIZE 1000

char newbuf[NEWSIZE];

char \*newp=newbuf;

void free(char \*p) //释放存区函数

{if (p>=newbuf && p< newbuf + NEWSIZE)

newp=p;

}

8-20

#define LINEMAX 20 /\*定义字符串的最大长度\*/

int main()

{int i;

char \*\*p,\*pstr[5],str[5][LINEMAX];

for (i=0;i<5;i++)

pstr[i]=str[i]; /\*将第i个字符串的首地址赋予指针数组 pstr 的第i个元素\*/

printf("input 5 strings:\n");

for (i=0;i<5;i++)

scanf("%s",pstr[i]);

p=pstr;

sort(p);

printf("strings sorted:\n");

for (i=0;i<5;i++)

printf("%s\n",pstr[i]);

}

sort(char \*\*p) /\*冒泡法对5个字符串排序函数\*/

{int i,j;

char \*temp;

for (i=0;i<5;i++)

{for (j=i+1;j<5;j++)

{if (strcmp(\*(p+i),\*(p+j))>0) /\*比较后交换字符串地址\*/

{temp=\*(p+i);

\*(p+i)=\*(p+j);

\*(p+j)=temp;

}

}

}

return 0;

}

8-21

#include<stdio.h>

int main()

{void sort(int \*\*p,int n);

int i,n,data[20],\*\*p,\*pstr[20];

printf("input n:\n");

scanf("%d",&n);

for (i=0;i<n;i++)

pstr[i]=&data[i]; //将第i个整数的地址赋予指针数组 pstr 的第i个元素

printf("input %d integer numbers:",n);

for (i=0;i<n;i++)

scanf("%d",pstr[i]);

p=pstr;

sort(p,n);

printf("Now,the sequence is:\n");

for (i=0;i<n;i++)

printf("%d ",\*pstr[i]);

printf("\n");

return 0;

}

void sort(int \*\*p,int n)

{int i,j,\*temp;

for (i=0;i<n-1;i++)

{for (j=i+1;j<n;j++)

{if (\*\*(p+i)>\*\*(p+j)) //比较后交换整数地址

{temp=\*(p+i);

\*(p+i)=\*(p+j);

\*(p+j)=temp;

}

}

}

}

第9章用户自己建立数据类型293  
9.1定义和使用结构体变量293  
9.1.1自己建立结构体类型293  
9.1.2定义结构体类型变量 295  
9.1.3结构体变量的初始化和引用297  
9.2使用结构体数组300  
9.2.1定义结构体数组300  
9.2.2结构体数组的应用举例301  
9.3结构体指针303  
9.3.1指向结构体变量的指针303  
9.3.2指向结构体数组的指针304  
9.3.3用结构体变量和结构体变量的指针作函数参数306  
9.4用指针处理链表309  
9.4.1什么是链表 309  
9.4.2建立简单的静态链表310  
9.4.3建立动态链表311  
9.4.4输出链表315  
9.5共用体类型317  
9.5.1什么是共用体类型317  
9.5.2引用共用体变量的方式318  
9.5.3共用体类型数据的特点319  
9.6使用枚举类型323  
9.7用typedef声明新类型名326  
习题330

9-1-1

#include <stdio.h>

struct

{ int year;

int month;

int day;

}date;

int main()

{int days;

printf("input year,month,day:");

scanf("%d,%d,%d",&date. year,&date.month,&date.day);

switch(date.month)

{ case 1: days=date.day; break;

case 2: days=date.day+31; break;

case 3: days=date.day+59; break;

case 4: days=date.day+90; break;

case 5: days=date.day+120; break;

case 6: days=date.day+151; break;

case 7: days=date.day+181; break;

case 8: days=date.day+212; break;

case 9: days=date.day+243; break;

case 10: days=date.day+273; break;

case 11: days=date.day+304; break;

case 12: days=date.day+334; break;

}

if ((date.year %4== 0 && date.year % 100 != 0

||date.year % 400 == 0) && date.month >=3) days+=1;

printf("%d/%d is the %dth day in %d.\n",date.month,date.day,days,date.year);

return 0;

}

9-1-2

#include <stdio.h>

struct

{ int year;

int month;

int day;

}date;

int main()

{int i,days;

int day\_tab[13]={0,31,28,31,30,31,30,31,31,30,31,30,31};

printf("input year,month,day:");

scanf("%d,%d,%d",&date. year,&date.month,&date.day);

days=0;

for(i=1;i<date.month;i++)

days=days+day\_tab[i];

days=days+date.day;

if((date.year%4==0 && date.year%100!=0 || date.year%400==0) && date.month>=3)

days=days+1;

printf("%d/%d is the %dth day in %d.\n",date.month,date.day,days,date.year);

return 0;

}

9-2-1

#include <stdio.h>

struct y\_m\_d

{ int year;

int month;

int day;

}date;

int main()

{ int days(struct y\_m\_d date1);

printf("input year,month,day:");

scanf("%d,%d,%d",&date.year,&date.month,&date.day);

printf("%d/%d is the %dth day in %d.\n",date.month,date.day,days(date),date.year);

}

int days(struct y\_m\_d date1)

{int sum;

switch(date1.month)

{case 1: sum=date1.day; break;

case 2: sum=date1.day+31; break;

case 3: sum=date1.day+59; break;

case 4: sum=date1.day+90; break;

case 5: sum=date1.day+120; break;

case 6: sum=date1.day+151; break;

case 7: sum=date1.day+181; break;

case 8: sum=date1.day+212; break;

case 9: sum=date1.day+243; break;

case 10: sum=date1.day+273; break;

case 11: sum=date1.day+304; break;

case 12: sum=date1.day+334; break;

}

if ((date1.year % 4 == 0 && date1.year % 100!=0|| date1.year % 400 == 0) && date1.month >=3)

sum+=1;

return(sum);

}

9-2-2

#include <stdio.h>

struct y\_m\_d

{int year;

int month;

int day;

} date;

int main()

{ int days(int year,int month,int day);

int days(int,int,int);

int day\_sum;

printf("input year,month,day:");

scanf("%d,%d,%d",&date. year,&date.month,&date.day);

day\_sum=days(date.year,date.month,date.day);

printf("%d / %d is the %dth day in %d.\n",date.month,date.day,day\_sum,date.year);

}

int days(int year,int month,int day)

{int day\_sum,i;

int day\_tab[13]={0,31,28,31,30,31,30,31,31,30,31,30,31};

day\_sum=0;

for (i=1;i<month;i++)

day\_sum+=day\_tab[i];

day\_sum+=day;

if ((year%4==0 && year%100!=0 || year%4==0) && month>=3)

day\_sum+=1;

return(day\_sum);

}

9-3

#include <stdio.h>

#define N 5

struct student

{ char num[6];

char name[8];

int score[4];

}stu[N];

int main()

{void print(struct student stu[6]);

int i,j;

for (i=0;i<N;i++)

{printf("\ninput score of student %d:\n",i+1);

printf("NO.: ");

scanf("%s",stu[i].num);

printf("name: ");

scanf("%s",stu[i].name);

for (j=0;j<3;j++)

{printf("score %d:",j+1);

scanf("%d",&stu[i].score[j]);

}

printf("\n");

}

print(stu);

return 0;

}

void print(struct student stu[6])

{int i,j;

printf("\n NO. name score1 score2 score3\n");

for (i=0;i<N;i++)

{printf("%5s%10s",stu[i].num,stu[i].name);

for (j=0;j<3;j++)

printf("%9d",stu[i].score[j]);

printf("\n");

}

}

9-4

#include <stdio.h>

#define N 5

struct student

{char num[6];

char name[8];

int score[4];

} stu[N];

int main()

{void input(struct student stu[]);

void print(struct student stu[]);

input(stu);

print(stu);

return 0;

}

void input(struct student stu[])

{int i,j;

for (i=0;i<N;i++)

{printf("input scores of student %d:\n",i+1);

printf("NO.: ");

scanf("%s",stu[i].num);

printf("name: ");

scanf("%s",stu[i].name);

for (j=0;j<3;j++)

{printf("score %d:",j+1);

scanf("%d",&stu[i].score[j]);

}

printf("\n");

}

}

void print(struct student stu[6])

{int i,j;

printf("\n NO. name score1 score2 score3

\n");

for (i=0;i<N;i++)

{printf("%5s%10s",stu[i].num,stu[i].name);

for (j=0;j<3;j++)

printf("%9d",stu[i].score[j]);

printf("\n");

}

9-5

#include <stdio.h>

#define N 10

struct student

{ char num[6];

char name[8];

float score[3];

float avr;

} stu[N];

int main()

{ int i,j,maxi;

float sum,max,average;

for (i=0;i<N;i++)

{printf("input scores of student %d:\n",i+1);

printf("NO.:");

scanf("%s",stu[i].num);

printf("name:");

scanf("%s",stu[i].name);

for (j=0;j<3;j++)

{printf("score %d:",j+1);

scanf("%f",&stu[i].score[j]);

}

}

average=0;

max=0;

maxi=0;

for (i=0;i<N;i++)

{sum=0;

for (j=0;j<3;j++)

sum+=stu[i].score[j];

stu[i].avr=sum/3.0;

average+=stu[i].avr;

if (sum>max)

{max=sum;

maxi=i;

}

}

average/=N;

printf(" NO. name score1 score2 score3 average\n");

for (i=0;i<N;i++)

{printf("%5s%10s",stu[i].num,stu[i].name);

for (j=0;j<3;j++)

printf("%9.2f",stu[i].score[j]);

printf(" %8.2f\n",stu[i].avr);

}

printf("average=%5.2f\n",average);

printf("The highest score is : student %s,%s\n",stu[maxi].num,stu[maxi].name);

printf("his scores are:%6.2f,%6.2f,%6.2f,average:%5.2f.\n",

stu[maxi].score[0],stu[maxi].score[1],stu[maxi].score[2],stu[maxi].avr);

return 0;

}

9-6

#include <stdio.h>

#define N 13

struct person

{int number;

int nextp;

} link[N+1];

int main()

{int i,count,h;

for (i=1;i<=N;i++)

{if (i==N)

link[i].nextp=1;

else

link[i].nextp=i+1;

link[i].number=i;

}

printf("\n");

count=0;

h=N;

printf("sequence that persons leave the circle:\n");

while(count<N-1)

{i=0;

while(i!=3)

{h=link[h].nextp;

if (link[h].number)

i++;

}

printf("%4d",link[h].number);

link[h].number=0;

count++;

}

printf("\nThe last one is ");

for (i=1;i<=N;i++)

if (link[i].number)

printf("%3d",link[i].number);

printf("\n");

return 0;

}

9-7

#include <stdio.h>

struct student

{long num;

float score;

struct student \*next;

};

int n;

struct student \*del(struct student \*head,long num)

{struct student \*p1,\*p2;

if (head==NULL) // 是空表

{printf("\nlist null!\n");

return(head);

}

p1=head; //使p1指向第一个结点

while(num!=p1->num && p1->next!=NULL) //p1指向的不是所要找的结点且后面还有结点 \*/

{p2=p1;p1=p1->next;} // p1后移一个结点

if(num==p1->num) // 找到了

{if(p1==head)head=p1->next; //若p1指向的是首结点,把第二个结点地址赋予head \*/

else p2->next=p1->next; // 否则将下一结点地址赋给前一结点地址

printf("delete:%ld\n",num);

n=n-1;

}

else printf("%ld not been found!\n",num); //找不到该结点

return(head);

}

9-8

#include <stdio.h>

struct student

{long num;

float score;

struct student\*next;

};

int n;

struct student \*insert(struct student \*head,struct student \*stud)

{struct student \*p0,\*p1,\*p2;

p1=head; //使ｐ１指向第一个结点

p0=stud; //指向要插入的结点

if(head==NULL) //原来的链表是空表

{head=p0;p0->next=NULL;} //使ｐ０指向的结点作为头结点

else

{while((p0->num>p1->num) && (p1->next!=NULL))

{p2=p1; //使ｐ２指向刚才p１指向的结点

p1=p1->next;

} //p1后移一个结点

if(p0->num<=p1->num)

{if(head==p1) head=p0; //插到原来第一个结点之前

else p2->next=p0; //插到p2指向的结点之后

p0->next=p1;

}

else

{p1->next=p0;

p0->next=NULL; //插到最后的结点之后

}

}

n=n+1; //结点数加１

return (head);

}

9-9-1

#include <stdio.h>

#include <malloc.h>

#define LEN sizeof(struct student)

struct student

{long num;

float score;

struct student \*next;

};

int n;

int main()

{struct student \*creat();

struct student \*del(struct student \* ,long);

struct student \*insert(struct student \*, struct student \*);

void print(struct student \*);

struct student \*head,stu;

long del\_num;

printf("input records:\n");

head=creat();

print(head);

printf("input the deleted number:");

scanf("%ld",&del\_num);

head=del(head,del\_num);

print(head);

printf("input the inserted record:");

scanf("%ld,%f",&stu.num,&stu.score);

head=insert(head,&stu);

print(head);

return 0;

}

struct student \*creat()

{struct student \*head;

struct student \*p1,\*p2;

n=0;

p1=p2=( struct student\*) malloc(LEN);

scanf("%ld,%f",&p1->num,&p1->score);

head=NULL;

while(p1->num!=0)

{n=n+1;

if(n==1)head=p1;

else p2->next=p1;

p2=p1;

p1=(struct student\*)malloc(LEN);

scanf("%ld,%f",&p1->num,&p1->score);

}

p2->next=NULL;

return(head);

}

struct student \*del(struct student \*head,long num)

{struct student \*p1,\*p2;

if (head==NULL)

{printf("\nlist null!\n");

return(head);

}

p1=head;

while(num!=p1->num && p1->next!=NULL)

{p2=p1;p1=p1->next;}

if(num==p1->num)

{if(p1==head)head=p1->next;

else p2->next=p1->next;

printf("delete:%ld\n",num);

n=n-1;

}

else printf("%ld not been found!\n",num);

return(head);

}

struct student \*insert(struct student \*head, struct student \*stud)

{struct student \*p0,\*p1,\*p2;

p1=head;

p0=stud;

if(head==NULL)

{head=p0; p0->next=NULL;}

else

{while((p0->num>p1->num) && (p1->next!=NULL))

{p2=p1;

p1=p1->next;

}

if(p0->num<=p1->num)

{if(head==p1) head=p0;

else p2->next=p0;

p0->next=p1;

}

else

{p1->next=p0; p0->next=NULL;}

}

n=n+1;

return(head);

}

void print(struct student \*head)

{struct student \*p;

printf("\nNow,These %d records are:\n",n);

p=head;

if(head!=NULL)

do

{printf("%ld %5.1f\n",p->num,p->score);

p=p->next;

}while(p!=NULL);

}

9-9-2

#include <stdio.h>

#include <malloc.h>

#define NULL 0

#define LEN sizeof(struct student)

struct student

{long num;

float score; struct student \*next;

};

int n;

int main()

{struct student \*creat();

struct student \*del(struct student \* ,long );

struct student \*insert(struct student \*, struct student \*);

void print(struct student \*);

struct student \*head,stu;

long del\_num;

printf("input records:\n");

head=creat();

print(head);

printf("input the deleted number:");

scanf("%ld",&del\_num);

head=del(head,del\_num);

print(head);

printf("input the inserted record:");

scanf("%ld,%f",&stu.num,&stu.score);

head=insert(head,&stu);

print(head);

printf("input the inserted record:");

scanf("%ld,%f",&stu.num,&stu.score);

head=insert(head,&stu);

print(head);

return 0;

}

struct student \*creat()

{struct student \*head;

struct student \*p1,\*p2;

n=0;

p1=p2=( struct student\*) malloc(LEN);

scanf("%ld,%f",&p1->num,&p1->score);

head=NULL;

while(p1->num!=0)

{n=n+1;

if(n==1)head=p1;

else p2->next=p1;

p2=p1;

p1=(struct student\*)malloc(LEN);

scanf("%ld,%f",&p1->num,&p1->score);

}

p2->next=NULL;

return(head);

}

struct student \*del(struct student \*head,long num)

{struct student \*p1,\*p2;

if (head==NULL)

{printf("\nlist null!\n");

return(head);

}

p1=head;

while(num!=p1->num && p1->next!=NULL)

{p2=p1;p1=p1->next;}

if(num==p1->num)

{if(p1==head)head=p1->next;

else p2->next=p1->next;

printf("delete:%ld\n",num);

n=n-1;

}

else printf("%ld not been found!\n",num);

return(head);

}

struct student \*insert(struct student \*head, struct student \*stud)

{struct student \*p0,\*p1,\*p2;

p1=head;

p0=stud;

if(head==NULL)

{head=p0; p0->next=NULL;}

else

{while((p0->num>p1->num) && (p1->next!=NULL))

{p2=p1;

p1=p1->next;

}

if(p0->num<=p1->num)

{if(head==p1) head=p0;

else p2->next=p0;

p0->next=p1;

}

else

{p1->next=p0; p0->next=NULL;}

}

n=n+1;

return(head);

}

void print(struct student \*head)

{struct student \*p;

printf("\nNow,These %d records are:\n",n);

p=head;

if(head!=NULL)

do

{printf("%ld %5.1f\n",p->num,p->score);

p=p->next;

}while(p!=NULL);

}

9-9-3

#include <stdio.h>

#include <malloc.h>

#define LEN sizeof(struct student)

struct student

{long num;

float score;

struct student \*next;

};

int n;

int main()

{struct student \*creat();

void print(struct student \*);

struct student \*del(struct student \*,long);

struct student \*insert(struct student \*, struct student \*);

struct student \*head,\*stu;

long del\_num;

printf("input records:\n");

head=creat();

print (head);

printf("input the deleted number:");

scanf("%ld",&del\_num);

while (del\_num!=0)

{head=del(head,del\_num);

print (head);

printf ("input the deleted number:");

scanf("%ld",&del\_num);}

printf("\ninput the inserted record:");

stu=(struct student \*) malloc(LEN);

scanf("%ld,%f",&stu->num,&stu->score);

while(stu->num!=0)

{head=insert(head,stu);

print(head);

printf("input the inserted record:");

stu=(struct student \*)malloc(LEN);

scanf("%ld,%f",&stu->num,&stu->score);

}

return 0;

}

struct student \*creat()

{struct student \*head;

struct student \*p1,\*p2;

n=0;

p1=p2=( struct student\*) malloc(LEN);

scanf("%ld,%f",&p1->num,&p1->score);

head=NULL;

while(p1->num!=0)

{n=n+1;

if(n==1)head=p1;

else p2->next=p1;

p2=p1;

p1=(struct student\*)malloc(LEN);

scanf("%ld,%f",&p1->num,&p1->score);

}

p2->next=NULL;

return(head);

}

struct student \*del(struct student \*head,long num)

{struct student \*p1,\*p2;

if (head==NULL)

{printf("\nlist null!\n");return(head);}

p1=head;

while(num!=p1->num && p1->next!=NULL)

{p2=p1;p1=p1->next;}

if(num==p1->num)

{if(p1==head)head=p1->next;

else p2->next=p1->next;

printf("delete:%ld\n",num);

n=n-1;

}

else printf("%ld not been found!\n",num);

return(head);

}

struct student \*insert(struct student \*head, struct student \*stud)

{struct student \*p0,\*p1,\*p2;

p1=head;

p0=stud;

if(head==NULL)

{head=p0; p0->next=NULL;}

else

{while((p0->num>p1->num) && (p1->next!=NULL))

{p2=p1;

p1=p1->next;

}

if(p0->num<=p1->num)

{if(head==p1) head=p0;

else p2->next=p0;

p0->next=p1;}

else

{p1->next=p0; p0->next=NULL;}

}

n=n+1;

return(head);

}

void print(struct student \*head)

{struct student \*p;

printf("\nNow,These %d records are:\n",n);

p=head;

if(head!=NULL)

do

{printf("%ld %5.1f\n",p->num,p->score);

p=p->next;

}while(p!=NULL);

}

9-10

#include <stdio.h>

#include <malloc.h>

#define LEN sizeof(struct student)

struct student

{long num;

int score;

struct student \*next;

};

struct student lista,listb;

int n,sum=0;

int main()

{struct student \*creat(void);

struct student \*insert(struct student \*,struct student \*);

void print(struct student \*);

struct student \*ahead,\*bhead,\*abh;

printf("input list a:\n");

ahead=creat();

sum=sum+n;

printf("input list b:\n");

bhead=creat();

sum=sum+n;

abh=insert(ahead,bhead);

print(abh);

return 0;

}

struct student \*creat(void) //建立链表函数

{struct student \*p1,\*p2,\*head;

n=0;

p1=p2=(struct student \*)malloc(LEN);

printf("input number & scores of student:\n");

printf("if number is 0,stop inputing.\n");

scanf("%ld,%d",&p1->num,&p1->score);

head=NULL;

while(p1->num !=0)

{n=n+1;

if (n==1)

head=p1;

else

p2->next=p1;

p2=p1;

p1=(struct student \*)malloc(LEN);

scanf("%ld,%d",&p1->num,&p1->score);

}

p2->next=NULL;

return(head);

}

struct student \*insert(struct student \*ah,struct student \*bh) //插入函数

{struct student \* pa1,\* pa2,\* pb1,\* pb2;

pa2=pa1=ah;

pb2=pb1=bh;

do

{while((pb1->num>pa1->num) && (pa1->next !=NULL))

{pa2=pa1;

pa1=pa1->next;

}

if (pb1->num <= pa1->num)

{if (ah==pa1)

ah=pb1;

else

pa2->next=pb1;

pb1=pb1->next;

pb2->next=pa1;

pa2=pb2;

pb2=pb1;

}

}while ((pa1->next!=NULL) || (pa1==NULL && pb1!=NULL));

if ((pb1!=NULL) && (pb1->num>pa1->num) && (pa1->next==NULL))

pa1->next=pb1;

return(ah);

}

void print(struct student \*head) //输出函数

{struct student \*p;

printf("There are %d records: \n",sum);

p=head;

if (p !=NULL)

do

{printf("%ld %d\n",p->num,p->score);

p=p->next;

}while (p !=NULL);

}

9-11

#include <stdio.h>

#include <string.h>

#define LA 4

#define LB 5

struct student

{int num;

char name[8];

struct student \*next;

} a[LA],b[LB];

int main()

{struct student a[LA]={{101,"Wang"},{102,"Li"},{105,"Zhang"},{106,"Wei"}};

struct student b[LB]={{103,"Zhang"},{104,"Ma"},{105,"Chen"},{107,"Guo"},{108,"lui"}};

int i;

struct student \*p,\*p1,\*p2,\*head1,\*head2;

head1=a;

head2=b;

printf(" list A: \n");

for (p1=head1,i=1;i<=LA;i++)

{if(i<LA) p1->next=a+i;

else p1->next=NULL;

printf("%4d%8s\n",p1->num,p1->name);

if(i<LA) p1=p1->next;

}

printf("\n list B:\n");

for (p2=head2,i=1;i<=LB;i++)

{if (i<LB) p2->next=b+i;

else p2->next=NULL;

printf("%4d%8s\n",p2->num,p2->name);

if (i<LB) p2=p2->next;

}

p1=head1;

while(p1!=NULL)

{p2=head2;

while ((p1->num != p2->num) && (p2->next!=NULL))

p2=p2->next;

if (p1->num == p2->num)

{if (p1==head1)

head1=p1->next;

else

{p->next=p1->next;p1=p1->next;}

}

else

{p=p1;p1=p1->next;}

}

printf("\nresult:\n");

p1=head1;

while(p1!=NULL)

{printf("%4d %7s \n",p1->num,p1->name);

p1=p1->next;

}

return 0;

}

9-12

#include <stdio.h>

#include <malloc.h>

#define LEN sizeof(struct student)

struct student

{ char num[6];

char name[8];

char sex[2];

int age;

struct student \*next;

} stu[10];

int main()

{ struct student \*p,\*pt,\*head;

int i,length,iage,flag=1;

int find=0; //找到待删除元素 find=1,否则find=0

while (flag==1)

{printf("input length of list(<10):");

scanf("%d",&length);

if (length<10)

flag=0;

}

//建立链表

for (i=0;i<length;i++)

{p=(struct student \*) malloc(LEN);

if (i==0)

head=pt=p;

else

pt->next=p;

pt=p;

printf("NO.:");

scanf("%s",p->num);

printf("name:");

scanf("%s",p->name);

printf("sex:");

scanf("%s",p->sex);

printf("age:");

scanf("%d",&p->age);

}

p->next=NULL;

p=head;

printf("\n NO. name sex age\n"); //显示

while(p!=NULL)

{printf("%4s%8s%6s%6d\n",p->num,p->name,p->sex,p->age);

p=p->next;

}

// 删除

printf("input age:"); //输入待删年龄

scanf("%d",&iage);

pt=head;

p=pt;

if (pt->age==iage) //链头是待删元素

{p=pt->next;

head=pt=p;

find=1;

}

else //链头不是待删元素

pt=pt->next;

while (pt!=NULL)

{if (pt->age==iage)

{p->next=pt->next;

find=1;

}

else // 中间结点不是待删元素

p=pt;

pt=pt->next;

}

if (!find)

printf(" not found %d.",iage);

p=head;

printf("\n NO. name sex age\n"); //显示结果

while (p!=NULL)

{printf("%4s%8s",p->num,p->name);

printf("%6s%6d\n",p->sex,p->age);

p=p->next;

}

return 0;

}

第10章对文件的输入输出331  
10.1C文件的有关基本知识331  
10.1.1什么是文件331  
10.1.2文件名332  
10.1.3文件的分类332  
10.1.4文件缓冲区333  
10.1.5文件类型指针333  
10.2打开与关闭文件335  
10.2.1用fopen函数打开数据文件335  
10.2.2用fclose函数关闭数据文件337  
10.3顺序读写数据文件338  
10.3.1怎样向文件读写字符338  
10.3.2怎样向文件读写一个字符串341  
10.3.3用格式化的方式读写文件344  
10.3.4用二进制方式向文件读写一组数据345  
10.4随机读写数据文件349  
10.4.1?募恢帽昙羌捌涠ㄎ?349  
10.4.2随机读写 352  
10.5文件读写的出错检测353  
习题354第11章常见错误分析355附录370附录A在Visual C++ 6.0环境下运行C程序的方法370  
附录B常用字符与ASCII代码对照表377  
附录CC语言中的关键字378  
附录D运算符和结合性378  
附录EC语言常用语法提要380  
附录FC库函数384  
参考文献390

10-3

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

int main ()

{

FILE \*fp;

char str[100];

int i=0;

if ((fp=fopen("a1","w"))==NULL)

{ printf("can not open file\n");

exit(0);

}

printf("input a string:\n");

gets(str);

while (str[i]!='!')

{if (str[i]>='a'&& str[i]<='z')

str[i]=str[i]-32;

fputc(str[i],fp);

i++;

}

fclose(fp);

fp=fopen("a1","r");

fgets(str,strlen(str)+1,fp);

printf("%s\n",str);

fclose(fp);

return 0;

}

10-4

#include <stdio.h>

#include <stdlib.h>

int main ()

{

FILE \*fp;

int i,j,n,i1;

char c[100],t,ch;

if ((fp=fopen("a1","r"))==NULL)

{ printf("\ncan not open file\n");

exit(0);

}

printf("file A :\n");

for (i=0;(ch=fgetc(fp))!=EOF;i++)

{

c[i]=ch;

putchar(c[i]);

}

fclose(fp);

i1=i;

if ((fp=fopen("b1","r"))==NULL)

{printf("\ncan not open file\n");

exit(0);

}

printf("\nfile B:\n");

for (i=i1;(ch=fgetc(fp))!=EOF;i++)

{c[i]=ch;

putchar(c[i]);

}

fclose(fp);

n=i;

for (i=0;i<n;i++)

for (j=i+1;j<n;j++)

if (c[i]>c[j])

{t=c[i];

c[i]=c[j];

c[j]=t;

}

printf("\nfile C :\n");

fp=fopen("c1","w");

for (i=0;i<n;i++)

{putc(c[i],fp);

putchar(c[i]);

}

printf("\n");

fclose(fp);

return 0;

}

10-5-1

#include <stdio.h>

struct student

{char num[10];

char name[8];

int score[3];

float ave;

} stu[5];

int main()

{ int i,j,sum;

FILE \*fp;

for(i=0;i<5;i++)

{printf("\ninput score of student %d:\n",i+1);

printf("NO.:");

scanf("%s",stu[i].num);

printf("name:");

scanf("%s",stu[i].name);

sum=0;

for (j=0;j<3;j++)

{printf("score %d:",j+1);

scanf("%d",&stu[i].score[j]);

sum+=stu[i].score[j];

}

stu[i].ave=sum/3.0;

}

/\*将数据写入文件\*/

fp=fopen("stud","w");

for (i=0;i<5;i++)

if (fwrite(&stu[i],sizeof(struct student),1,fp)!=1)

printf("file write error\n");

fclose(fp);

fp=fopen("stud","r");

for (i=0;i<5;i++)

{fread(&stu[i],sizeof(struct student),1,fp);

printf("\n%s,%s,%d,%d,%d,%6.2f\n",stu[i].num,stu[i].name,stu[i].score[0],

stu[i].score[1],stu[i].score[2],stu[i].ave);}

return 0;

}

10-5-2

#include <stdio.h>

#define SIZE 5

struct student

{char name[10];

int num;

int score[3];

float ave;

} stud[SIZE];

int main()

{ void save(void);

int i;

float sum[SIZE];

FILE \*fp1;

for (i=0;i<SIZE;i++)

{ scanf("%s %d %d %d %d",stud[i].name,&stud[i].num,&stud[i].score[0],

&stud[i].score[1],&stud[i].score[2]);

sum[i]=stud[i].score[0]+stud[i].score[1]+stud[i].score[2];

stud[i].ave=sum[i]/3;

}

save();

fp1=fopen("stu.dat","rb");

printf("\n name NO. score1 score2 score3 ave\n");

printf("-----------------------------------------------\n");

for (i=0;i<SIZE;i++)

{fread(&stud[i],sizeof(struct student),1,fp1);

printf("%-10s %3d %7d %7d %7d %8.2f\n",stud[i].name,stud[i].num,

stud[i].score[0],stud[i].score[1],stud[i].score[2],stud[i].ave);

}

fclose (fp1);

return 0;

}

void save(void)

{

FILE \*fp;

int i;

if ((fp=fopen("stu.dat","wb"))==NULL)

{printf("The file can not open\n");

return;

}

for(i=0;i<SIZE;i++)

if (fwrite(&stud[i],sizeof(struct student),1,fp)!=1)

{printf("file write error\n");

return;

}

fclose(fp);

}

10-6-1

#include <stdio.h>

#include <stdlib.h>

#define N 10

struct student

{char num[10];

char name[8];

int score[3];

float ave;

} st[N],temp;

int main()

{FILE \*fp;

int i,j,n;

/\*读文件\*/

if ((fp=fopen("stud","r"))==NULL)

{printf("can not open.\n");

exit(0);

}

printf("File 'stud': ");

for (i=0;fread(&st[i],sizeof(struct student),1,fp)!=0;i++)

{printf("\n%8s%8s",st[i].num,st[i].name);

for (j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

printf("\n");

fclose(fp);

n=i;

/\*排序\*/

for (i=0;i<n;i++)

for (j=i+1;j<n;j++)

if (st[i].ave < st[j].ave)

{temp=st[i];

st[i]=st[j];

st[j]=temp;

}

/\*输出\*/

printf("\nNow:");

fp=fopen("stu\_sort","w");

for (i=0;i<n;i++)

{fwrite(&st[i],sizeof(struct student),1,fp);

printf("\n%8s%8s",st[i].num,st[i].name);

for (j=0;j<3;j++)

printf ("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

printf("\n");

fclose(fp);

return 0;

}

10-6-2

#include <stdio.h>

#include <stdlib.h>

#define SIZE 5

struct student

{

char name[10];

int num;

int score[3];

float ave;

} stud[SIZE],work;

int main()

{

void sort(void);

int i;

FILE \*fp;

sort();

fp=fopen("stud\_sort.dat","rb");

printf("sorted student's scores list as follow\n");

printf("----------------------------------------------------\n");

printf(" NAME N0. SCORE1 SCORE2 SCORE3 AVE \n");

printf("----------------------------------------------------\n");

for (i=0;i<SIZE;i++)

{

fread(&stud[i],sizeof(struct student),1,fp);

printf("%-10s %3d %8d %8d %8d %9.2f\n",stud[i].name,stud[i].num,

stud[i].score[0],stud[i].score[1],stud[i].score[2],stud[i].ave);

}

fclose(fp);

return 0;

}

void sort(void)

{FILE \*fp1,\*fp2;

int i,j;

if ((fp1=fopen("stu.dat","rb"))==NULL)

{printf("The file can not open\n\n");

exit(0);

}

if ((fp2=fopen("stud\_sort.dat","wb"))==NULL)

{printf("The file write error\n");

exit(0);

}

for (i=0;i<SIZE;i++)

if (fread(&stud[i],sizeof(struct student),1,fp1)!=1)

{printf("file read error\n");

exit(0);

}

for (i=0;i<SIZE;i++)

{for (j=i+1;j<SIZE;j++)

if (stud[i].ave<stud[j].ave)

{work=stud[i];

stud[i]=stud[j];

stud[j]=work;

}

fwrite(&stud[i],sizeof(struct student),1,fp2);

}

fclose(fp1);

fclose(fp2);

}

10-7

#include <stdio.h>

#include <stdlib.h>

struct student

{char num[10];

char name[8];

int score[3];

float ave;

} st[10],s;

int main()

{FILE \*fp,\*fp1;

int i,j,t,n;

printf("\nNO.:");

scanf("%s",s.num);

printf("name:");

scanf("%s",s.name);

printf("score1,score2,score3:");

scanf("%d,%d,%d",&s.score[0],&s.score[1],&s.score[2]);

s.ave=(s.score[0]+s.score[1]+s.score[2])/3.0;

/\*从文件读数据\*/

if((fp=fopen("stu\_sort","r"))==NULL)

{printf("can not open file.");

exit(0);

}

printf("original data:\n");

for (i=0;fread(&st[i],sizeof(struct student),1,fp)!=0;i++)

{printf("\n%8s%8s",st[i].num,st[i].name);

for (j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

n=i;

for (t=0;st[t].ave>s.ave && t<n;t++);

/\*向文件写数据\*/

printf("\nNow:\n");

fp1=fopen("sort1.dat","w");

for (i=0;i<t;i++)

{fwrite(&st[i],sizeof(struct student),1,fp1);

printf("\n %8s%8s",st[i].num,st[i].name);

for (j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

fwrite(&s,sizeof(struct student),1,fp1);

printf("\n %8s %7s %7d %7d %7d%10.2f",s.num,s.name,s.score[0],

s.score[1],s.score[2],s.ave);

for (i=t;i<n;i++)

{fwrite(&st[i],sizeof(struct student),1,fp1);

printf("\n %8s%8s",st[i].num,st[i].name);

for(j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

printf("\n");

fclose(fp);

fclose(fp1);

return 0;

}

10-8

#include <stdio.h>

#include <stdlib.h>

struct student

{char num[10];

char name[8];

int score[3];

float ave;

} st[10],s;

int main()

{FILE \*fp,\*fp1;

int i,j,t,n;

printf("\nNO.:");

scanf("%s",s.num);

printf("name:");

scanf("%s",s.name);

printf("score1,score2,score3:");

scanf("%d,%d,%d",&s.score[0],&s.score[1],&s.score[2]);

s.ave=(s.score[0]+s.score[1]+s.score[2])/3.0;

/\*从文件读数据\*/

if((fp=fopen("stu\_sort","r"))==NULL)

{printf("can not open file.");

exit(0);

}

printf("original data:\n");

for (i=0;fread(&st[i],sizeof(struct student),1,fp)!=0;i++)

{printf("\n%8s%8s",st[i].num,st[i].name);

for (j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

n=i;

for (t=0;st[t].ave>s.ave && t<n;t++);

/\*向文件写数据\*/

printf("\nNow:\n");

fp1=fopen("sort1.dat","w");

for (i=0;i<t;i++)

{fwrite(&st[i],sizeof(struct student),1,fp1);

printf("\n %8s%8s",st[i].num,st[i].name);

for (j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

fwrite(&s,sizeof(struct student),1,fp1);

printf("\n %8s %7s %7d %7d %7d%10.2f",s.num,s.name,s.score[0],

s.score[1],s.score[2],s.ave);

for (i=t;i<n;i++)

{fwrite(&st[i],sizeof(struct student),1,fp1);

printf("\n %8s%8s",st[i].num,st[i].name);

for(j=0;j<3;j++)

printf("%8d",st[i].score[j]);

printf("%10.2f",st[i].ave);

}

printf("\n");

fclose(fp);

fclose(fp1);

return 0;

}

10-9

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

struct emploee

{char num[6];

char name[10];

char sex[2];

int age;

char addr[20];

int salary;

char health[8];

char class[10];

}em[10];

struct emp

{char name[10];

int salary;

}em\_case[10];

int main()

{FILE \*fp1,\*fp2;

int i,j;

if ((fp1=fopen("emploee","r"))==NULL)

{printf("can not open file.\n");

exit(0);

}

printf("\n NO. name sex age addr salary health class\n");

for (i=0;fread(&em[i],sizeof(struct emploee),1,fp1)!=0;i++)

{printf("\n%4s%8s%4s%6d%10s%6d%10s%8s",em[i].num,em[i].name,em[i].sex,

em[i].age,em[i].addr,em[i].salary,em[i].health,em[i].class);

strcpy(em\_case[i].name,em[i].name);

em\_case[i].salary=em[i].salary;

}

printf("\n\n \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* ");

if((fp2=fopen("emp\_salary","wb"))==NULL)

{printf("can not open file\n");

exit(0);

}

for (j=0;j<i;j++)

{if(fwrite(&em\_case[j],sizeof(struct emp),1,fp2)!=1)

printf("error!");

printf("\n %12s%10d",em\_case[j].name,em\_case[j].salary);

}

printf("\n \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* ");

fclose(fp1);

fclose(fp2);

return 0;

}

10-10

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

struct emploee

{char name[10];

int salary;

}emp[20];

int main()

{ FILE \*fp;

int i,j,n,flag;

char name[10];

if ((fp=fopen("emp\_salary","rb"))==NULL)

{printf("can not open file.\n");

exit(0);

}

printf("\noriginal data:\n");

for (i=0;fread(&emp[i],sizeof(struct emploee),1,fp)!=0;i++)

printf("\n %8s %7d",emp[i].name,emp[i].salary);

fclose(fp);

n=i;

printf("\ninput name deleted:\n");

scanf("%s",name);

for (flag=1,i=0;flag && i<n;i++)

{if (strcmp(name,emp[i].name)==0)

{for (j=i;j<n-1;j++)

{strcpy(emp[j].name,emp[j+1].name);

emp[j].salary=emp[j+1].salary;

}

flag=0;

}

}

if(!flag)

n=n-1;

else

printf("\nnot found!");

printf("\nNow,The content of file:\n");

if((fp=fopen("emp\_salary","wb"))==NULL)

{printf("can not open file\n");

exit(0);

}

for (i=0;i<n;i++)

fwrite(&emp[i],sizeof(struct emploee),1,fp);

fclose(fp);

fp=fopen("emp\_salary","r");

for (i=0;fread(&emp[i],sizeof(struct emploee),1,fp)!=0;i++)

printf("\n%8s %7d",emp[i].name,emp[i].salary);

printf("\n");

fclose(fp);

return 0;

}

10-11

#include <stdio.h>

int main()

{ int i,flag;

char str[80],c;

FILE \*fp;

fp=fopen("text","w");

flag=1;

while(flag==1)

{printf("input string:\n");

gets(str);

fprintf(fp,"%s ",str);

printf("continue?");

c=getchar();

if ((c=='N')||(c=='n'))

flag=0;

getchar();

}

fclose(fp);

fp=fopen("text","r");

while(fscanf(fp,"%s",str)!=EOF)

{for (i=0;str[i]!='\0';i++)

if ((str[i]>='a') && (str[i]<='z'))

str[i]-=32;

printf("%s\n",str);

}

fclose(fp);

return 0;

}

第11章常见错误分析374  
附录390附录A在Visual C++ 6.0环境下运行C程序的方法390  
附录CC语言中的关键字398  
附录D运算符和结合性398  
附录EC语言常用语法提要400  
附录FC库函数404

11-1

#include <stdio.h>

#define swap(a,b)t=b;b=a;a=t

int main()

{

int a,b,t;

printf("input two integer a,b:");

scanf("%d,%d",&a,&b);

swap(a,b);

printf("Now,a=%d,b=%d\n",a,b);

return 0;

}

11-2

#include <stdio.h>

#define SURPLUS(a,b)((a)%(b))

int main()

{

int a,b;

printf("input two integer a,b:");

scanf("%d,%d",&a,&b);

printf("remainder is %d\n",SURPLUS(a,b));

return 0;

}

11-4

#include<stdio.h>

#define LEAP\_YEAR(y)((y%4==0)&&(y%100!=0)||(y%400==0))

int main()

{

int year;

printf("\ninput year:");

scanf("%d",&year);

if(LEAP\_YEAR(year))

printf("%d is a leap year.\n",year);

else

printf("%d is not a leap year. \n",year);

return 0;

}

11-5

#include <stdio.h>

#define NL putchar('\n')

#define PR(format,value) printf("value=%format\t",(value))

#define PRINT1(f,x1) PR(f,x1);NL

#define PRINT2(f,x1,x2) PR(f,x1);PRINT1(f,x2)

int main()

{

float x=5.0,x1=3.0,x2=8.0;

char d='f';

PR(d,x);

PRINT1(d,x);

PRINT2(d,x1,x2);

return 0;

}

11-6

#include<stdio.h>

#define PR printf

#define NL "\n"

#define Fs "%f"

#define F "%6.2f"

#define F1 F NL

#define F2 F"\t" F NL

#define F3 F"\t" F "\t" F NL

int main()

{float a,b,c;

PR("input three floating number a,b,c:\n");

scanf(Fs,&a);

scanf(Fs,&b);

scanf(Fs,&c);

PR(NL);

PR("output one floating number each line:\n");

PR(F1,a);

PR(F1,b);

PR(F1,c);

PR(NL);

PR("output two floating number:\n");

PR(F2,a,b);

PR(F1,c);

PR(NL);

PR("output three floating number:\n");

PR(F3,a,b,c);

return 0;

}

11-7

#include <stdio.h>

#include "format.h"

int main ()

{

int d,num;

float f;

char s[80];

printf("choice data format: 1-integer,2-float,3-string:");

scanf("%d",&num);

switch(num)

{case 1: printf("input integer: ");

scanf("%d",&d);

INTEGER(d);

break;

case 2: printf("input float: ");

scanf("%f",&f);

FLOAT(f);

break;

case 3: printf("input string: ");

scanf("%s",&s);

STRING(s);

break;

default: printf("input error!\n");

}

return 0;

}

11-8-1

#include<stdio.h>

int main()

{int max(int x,int y,int z);

int a,b,c;

printf("input three integer: ");

scanf("%d,%d,%d",&a,&b,&c);

printf("max=%d\n",max(a,b,c));

return 0;

}

11-8-2

#include<stdio.h>

#define MAX(a,b)((a)>(b)?(a):(b))

int main()

{

int a,b,c;

printf("input three integer: ");

scanf("%d,%d,%d",&a,&b,&c);

printf("max=%d\n",MAX(MAX(a,b),c));

return 0;

}

11-10

#include <stdio.h>

#define MAX 80

#define CHANGE 1

int main()

{

char str[MAX];

int i;

printf("input text:\n");

gets(str);

#if(CHANGE)

{for(i=0;i<MAX;i++)

{if(str[i]!='\0')

if(str[i]>='a'&&str[i]<'z'||str[i]>='A'&&str[i]<='Z')

str[i]+=1;

else if(str[i]=='z'||str[i]=='Z')

str[i]-=25;

}

}

#endif

printf("output:\n%s\n",str);

return 0;

}

12-1

#include <stdio.h>

int main()

{unsigned a,b,c,d;

printf("please enter a:");

scanf("%o",&a);

b=a>>4;

c=~(~0<<4);

d=b & c;

printf("%o,%d\n%o,%d\n",a,a,d,d);

return 0;

}

12-2

#include <stdio.h>

int main()

{unsigned short a,b,c;

int n;

printf("please enter a & n:\n");

scanf("a=%o,n=%d",&a,&n);

b=a<<(16-n);

c=a>>n;

c=c|b;

printf("a:%o\nc:%o\n",a,c);

return 0;

}