第二章：开始学习C++

//ex2.1--display your name and address

#include<iostream>

int main(void)

{

using namespace std;

cout<<"My name is liao chunguang and I live in hunan chenzhou.\n”；

}

//ex2.2--convert the furlong units to yard uints-把浪单位换位码单位

#include<iostream>

double fur2yd(double);

int main()

{

using namespace std;

cout<<"enter the distance measured by furlong units:";

double fur;

cin>>fur;

cout<<"convert the furlong to yard"<<endl;

double yd;

yd=fur2yd(fur);

cout<<fur<<" furlong is "<<yd<<" yard"<<endl;

return 0;

}

double fur2yd(double t)

{

return 220\*t;

}

//ex2.3-每个函数都被调用两次

#include<iostream>

void mice();

void see();

using namespace std;

int main()

{

mice();

mice();

see();

see();

return 0;

}

void mice()

{

cout<<"three blind mice"<<endl;

}

void see()

{

cout<<"see how they run"<<endl;

}

//ex2.4

#include<iostream>

int main()

{

using namespace std;

cout<<"Enter your age:";

int age;

cin>>age;

int month;

month=age\*12;

cout<<age<<" years is "<<month<<" months"<<endl;

return 0;

}

//ex2.5---convert the Celsius valve to Fahrenheit value

#include<iostream>

double C2F(double);

int main()

{

using namespace std;

cout<<"please enter a Celsius value:";

double C;

cin>>C;

double F;

F=C2F(C);

cout<<C<<" degrees Celsius is "<<F<<" degrees Fahrenheit."<<endl;

return 0;

}

double C2F(double t)

{

return 1.8\*t+32;

}

//ex2.6---convert the light years valve to astronomical units--把光年转换为天文单位

#include<iostream>

double convert(double);//函数原型

int main()

{

using namespace std;

cout<<"Enter the number of light years:";

double light\_years;

cin>>light\_years;

double astro\_units;

astro\_units=convert(light\_years);

cout<<light\_years<<" light\_years = "<<astro\_units<<" astronomical units."<<endl;

return 0;

}

double convert(double t)

{

return 63240\*t;//1 光年=63240 天文单位

}

//ex2.7--显示用户输入的小时数和分钟数

#include<iostream>

void show();

main()

{

using namespace std;

show();

return 0;

}

void show()

{

using namespace std;

int h,m;

cout<<"enter the number of hours:";

cin>>h;

cout<<"enter the number of minutes:";

cin>>m;

cout<<"Time:"<<h<<":"<<m<<endl;

}

第三章：处理数据

//ex3.1—将身高用英尺(feet)和英寸(inch)表示

#include<iostream>

const int inch\_per\_feet=12;// const 常量--1feet=12inches--1 英尺=12 英寸

int main()

{

using namespace std;

cout<<"please enter your height in inches:\_\_\_\b\b\b";// \b 表示为退格字符

int ht\_inch;

cin>>ht\_inch;

int ht\_feet=ht\_inch/inch\_per\_feet;//取商

int rm\_inch=ht\_inch%inch\_per\_feet;//取余

cout<<"your height is "<<ht\_feet<<" feet,and "

<<rm\_inch<<" inches\n";

return 0;

}

//ex3.2--计算相应的body mass index（体重指数）

#include<iostream>

const int inch\_per\_feet=12;

const double meter\_per\_inch=0.0254;

const double pound\_per\_kilogram=2.2;

int main()

{

using namespace std;

cout<<"Please enter your height:"<<endl;

cout<<"First,enter your height of feet part（输入你身高的英尺部分）:\_\b";

int ht\_feet;

cin>>ht\_feet;

cout<<"Second,enter your height of inch part（输入你身高的英寸部分）:\_\b";

int ht\_inch;

cin>>ht\_inch;

cout<<"Now,please enter your weight in pound:\_\_\_\b\b\b";

double wt\_pound;

cin>>wt\_pound;

int inch;

inch=ht\_feet\*inch\_per\_feet+ht\_inch;

double ht\_meter;

ht\_meter=inch\*meter\_per\_inch;

double wt\_kilogram;

wt\_kilogram=wt\_pound/pound\_per\_kilogram;

cout<<endl;

cout<<"Your pensonal body information as follows:"<<endl;

cout<<"身高:"<<inch<<"(英尺inch)\n"<<"身高:"<<ht\_meter<<"(米meter)\n"

<<"体重:"<<wt\_kilogram<<"(千克kilogram)\n";

double BMI;

BMI=wt\_kilogram/(ht\_meter\*ht\_meter);

cout<<"your Body Mass Index(体重指数) is "<<BMI<<endl;

return 0;

}

//ex3.3 以度，分，秒输入，以度输出

#include<iostream>

const int minutes\_per\_degree=60;

const int seconds\_per\_minute=60;

int main()

{

using namespace std;

cout<<"Enter a latitude in degrees,minutes,and seconds:\n";

cout<<"First,enter the degrees:";

int degree;

cin>>degree;

cout<<"Next,enter the minutes of arc:";

int minute;

cin>>minute;

cout<<"Fianlly,enter the seconds of arc:";

int second;

cin>>second;

double show\_in\_degree;

show\_in\_degree=(double)degree+(double)minute/minutes\_per\_degree+(double)second/mi

nutes\_per\_degree/seconds\_per\_minute;

cout<<degree<<" degrees,"<<minute<<" minutes,"<<second<<"seconds

="<<show\_in\_degree<<" degrees\n";

return 0;

}

//ex3.4

#include<iostream>

const int hours\_per\_day=24;

const int minutes\_per\_hour=60;

const int seconds\_per\_minute=60;

int main()

{

using namespace std;

cout<<"Enter the number of seconds:";

long seconds;

cin>>seconds;

int Day,Hour,Minute,Second;

Day=seconds/seconds\_per\_minute/minutes\_per\_hour/hours\_per\_day;

Hour=seconds/seconds\_per\_minute/minutes\_per\_hour%hours\_per\_day;

Minute=seconds/seconds\_per\_minute%minutes\_per\_hour;

Second=seconds%seconds\_per\_minute;

cout<<seconds<<"seconds = "<<Day<<" days,"<<Hour<<" hours,"<<Minute<<"

minutes,"<<Second<<" seconds\n";

return 0;

}

//ex3.5

#include<iostream>

int main()

{

using namespace std;

cout<<"Enter the world population:";

long long world\_population;

cin>>world\_population;

cout<<"Enter the population of the US:";

long long US\_population;

cin>>US\_population;

double percentage;

percentage=(double)US\_population/world\_population\*100;

cout<<"The population of the US is "<<percentage<<"% of the world population.\n";

return 0;

}

//ex3.6 汽车耗油量-美国(mpg)or 欧洲风格(L/100Km)

#include<iostream>

int main()

{

using namespace std;

cout<<"Enter the miles of distance you have driven:";

double m\_distance;

cin>>m\_distance;

cout<<"Enter the gallons of gasoline you have used:";

double m\_gasoline;

cin>>m\_gasoline;

cout<<"Your car can run "<<m\_distance/m\_gasoline<<" miles per gallon\n";

cout<<"Computing by European style:\n";

cout<<"Enter the distance in kilometers:";

double k\_distance;

cin>>k\_distance;

cout<<"Enter the petrol in liters:";

double k\_gasoline;

cin>>k\_gasoline;

cout<<"In European style:"<<"your can used "<<100\*k\_gasoline/k\_distance<<" liters of petrol

per 100 kilometers\n";

return 0;

}

//ex3.7 automobile gasoline consumption-耗油量--欧洲风格(L/100Km)转换成美国风格(mpg)

#include<iostream>

int main()

{

using namespace std;

cout<<"Enter the automobile gasoline consumption figure in\n"

<<"European style(liters per 100 kilometers):";

double Euro\_style;

cin>>Euro\_style;

cout<<"Converts to U.S. style(miles per gallon):"<<endl;

cout<<Euro\_style<<" L/100Km = "<<62.14\*3.875/Euro\_style<<" mpg\n";

return 0;

}

// Note that 100 kilometers is 62.14 miles, and 1 gallon is 3.875 liters.

//Thus, 19 mpg is about 12.4 L/100Km, and 27 mpg is about 8.7 L/100Km.

Enter the automobile gasoline consumption figure in

European style(liters per 100 kilometers):12.4

Converts to U.S. style(miles per gallon):

12.4 L/100Km = 19.4187 mpg

Press any key to continue

// ex3.7 automobile gasoline consumption-耗油量--美国风格(mpg)转换成欧洲风格(L/100Km)

#include<iostream>

int main()

{

using namespace std;

cout<<"Enter the automobile gasoline consumption figure in\n"

<<"U.S. style(miles per gallon):";

double US\_style;

cin>>US\_style;

cout<<"Converts to European style(miles per gallon):"<<endl;

cout<<US\_style<<" mpg = "<< 62.14\*3.875/US\_style<<"L/100Km\n";

return 0;

}

// Enter the automobile gasoline consumption figure in

U.S. style(miles per gallon):19

Converts to European style(miles per gallon):

19 mpg = 12.6733L/100Km

Press any key to continue

第四章复合类型

**//ex4.1 display the information of**

**student**

#include<iostream>

const int Asize=20;

using namespace std;

struct student//定义结构描述

{

char firstname[Asize];

char lastname[Asize];

char grade;

int age;

};

void display(student);//函数原型放在结构描述后

int main()

{

cout<<"what is your first name?"<<endl;

student lcg;//创建结构变量（结构数据对象）

cin.getline(lcg.firstname,Asize);

cout<<"what is your last name?"<<endl;

cin.getline(lcg.lastname,Asize);

cout<<"what letter grade do you deserve?"<<endl;

cin>>lcg.grade;

cout<<"what is your age?"<<endl;

cin>>lcg.age;

display(lcg);

return 0;

}

void display(student name)

{

cout<<"Name: "<<name.firstname<<","<<name.lastname<<endl;

cout<<"Grade:"<<char(name.grade+1)<<endl;

cout<<"Age:"<<name.age<<endl;

}

//ex4.2 use the string-class instead of char-array

#include<iostream>

#include<string>

int main()

{

using namespace std;

string name,dessert;

cout<<"Enter your name: \n";

getline(cin,name);

cout<<"Enter your favorite dessert: \n";

getline(cin,dessert);

cout<<"I have some delicious "<<dessert;

cout<<" for you, "<<name<<".\n";

return 0;

}

//有时候会遇到需要按下两次回车键才能正确的显示结果，这是vc++6.0 的一个BUG，更改

如下：else if (\_Tr::eq((\_E)\_C, \_D))

{\_Chg = true;

\_I.rdbuf()->sbumpc();//修改后的

break; }

ex4.3 输入其名和姓，并组合显示

#include<iostream>

#include<cstring>

const int Asize=20;

int main()

{

using namespace std;

char fname[Asize];

char lname[Asize];

char fullname[2\*Asize+1];

cout<<"Enter your first name:";//输入名字，存储在fname[]数组中

cin.getline(fname,Asize);

cout<<"Enter your last name:";//输入姓，存储在lname[]数组中

cin.getline(lname,Asize);

strncpy(fullname,lname,Asize);//把姓lname 复制到fullname 空数组中

strcat(fullname,", ");//把“， ”附加到上述fullname 尾部

strncat(fullname,fname,Asize);//把fname 名字附加到上述fullname 尾部

fullname[2\*Asize]='\0';//为防止字符型数组溢出，在数组结尾添加结束符

cout<<"Here's the information in a single string:"<<fullname<<endl;//显示组合结果

return 0;

}

#define \_CRT\_SECURE\_NO\_WARNINGS

#include <iostream>

#include <cstring>

const int Asize = 20;

int main()

{

using namespace std;

char firstname[Asize];

char lastname[50];

cout << "Enter your first name: ";

cin.getline(firstname,Asize);

cout << "Enter your last name: ";

cin.getline(lastname,50);

strcat(lastname,", ");

strncat(lastname,firstname,Asize);

cout << "Here's the information in a single string: "

<< lastname <<endl;

return 0;

}

//ex4.4 使用string 对象存储、显示组合结果

#include<iostream>

#include<string>

int main()

{

using namespace std;

string fname,lname,attach,fullname;

cout<<"Enter your first name:";

getline(cin,fname);//note:将一行输入读取到string 类对象中使用的是getline(cin,str)

//它没有使用句点表示法，所以不是类方法

cout<<"Enter your last name:";

getline(cin,lname);

attach=", ";

fullname=lname+attach+fname;

cout<<"Here's the information in a single string:"<<fullname<<endl;

return 0;

}

//ex4.5 declare a struct and initialize it 声明结果并创建一个变量

#include<iostream>

const int Asize=20;

struct CandyBar

{

char brand[Asize];

double weight;

int calory;

};

int main()

{

using namespace std;

CandyBar snack={"Mocha Munch",2.3,350};

cout<<"Here's the information of snack:\n";

cout<<"brand:"<<snack.brand<<endl;

cout<<"weight:"<<snack.weight<<endl;

cout<<"calory:"<<snack.calory<<endl;

return 0;

}

//ex4.6 结构数组的声明及初始化

#include<iostream>

const int Asize=20;

struct CandyBar

{

char brand[Asize];

double weight;

int calory;

};

int main()

{

using namespace std;

CandyBar snack[3]={

{"Mocha Munch",2.3,350},

{"XuFuJi",1.1,300},

{"Alps",0.4,100}

};

for(int i=0;i<3;i++)//利用for 循环来显示snack 变量的内容

{

cout<<snack[i].brand<<endl

<<snack[i].weight<<endl

<<snack[i].calory<<endl<<endl;

}

return 0;

}

//ex4.7 pizza 披萨饼

#include<iostream>

#include<string>

const int Size=20;

struct pizza//声明结构

{

char company[Size];

double diameter;

double weight;

};

int main()

{

using namespace std;

pizza pie;//创建一个名为pie 的结构变量

cout<<"What's the name of pizza company:";

cin.getline(pie.company,Size);

cout<<"What's the diameter of pizza:";

cin>>pie.diameter;

cout<<"What's the weight of pizza:";

cin>>pie.weight;

cout<<"company:"<<pie.company<<endl;

cout<<"diameter:"<<pie.diameter<<"inches"<<endl;

cout<<"weight:"<<pie.weight<<"ounches"<<endl;

return 0;

}

//ex4.8 pizza pie 披萨饼使用new 创建动态结构

#include<iostream>

#include<string>

const int Size=20;

struct pizza//声明结构

{

char company[Size];

double diameter;

double weight;

};

int main()

{

using namespace std;

pizza \*pie=new pizza;//使用new 创建动态结构

cout<<"What's the diameter of pizza:";

cin>>pie->diameter;

cin.get();//读取下一个字符

cout<<"What's the name of pizza company:";

cin.get(pie->company,Size);

cout<<"What's the weight of pizza:";

cin>>pie->weight;

cout<<"diameter:"<<pie->diameter<<" inches"<<endl;

cout<<"company:"<<pie->company<<endl;

cout<<"weight:"<<pie->weight<<" ounches"<<endl;

delete pie;//delete 释放内存

return 0;

}

//ex.4.9 使用new 动态分配数组—方法1

#include<iostream>

#include<string>

using namespace std;

struct CandyBar

{

string brand;

double weight;

int calory;

};

int main()

{

CandyBar \*snack= new CandyBar[3];

snack[0].brand="A";//单个初始化由new 动态分配的内存

snack[0].weight=1.1;

snack[0].calory=200;

snack[1].brand="B";

snack[1].weight=2.2;

snack[1].calory=400;

snack[2].brand="C";

snack[2].weight=4.4;

snack[2].calory=500;

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

{

cout << " brand: " << snack[i].brand << endl;

cout << " weight: " << snack[i].weight << endl;

cout << " calorie: " << snack[i].calory << endl<<endl;

}

delete [] snack;

return 0;

}

//ex.4.10 数组—方法1

#include <iostream>

int main()

{

using namespace std;

const int Size = 3;

int success[Size];

cout<<"Enter your success of the three times 40 meters running:\n";

cin >> success[0]>>success[1]>>success[2];

cout<<"success1:"<<success[0]<<endl;

cout<<"success2:"<<success[1]<<endl;

cout<<"success3:"<<success[2]<<endl;

double average=(success[0]+success[1]+success[2])/3;

cout<<"average:"<<average<<endl;

return 0;

}

//ex.4.10 array—方法2

#include <iostream>

#include <array>

int main()

{

using namespace std;

array<double,4>ad={0};

cout<<"Enter your success of the three times 40 meters running:\n";

cin >> ad[0]>>ad[1]>>ad[2];

cout<<"success1:"<<ad[0]<<endl;

cout<<"success2:"<<ad[1]<<endl;

cout<<"success3:"<<ad[2]<<endl;

ad[3]=(ad[0]+ad[1]+ad[2])/3;

cout<<"average:"<<ad[3]<<endl;

return 0;

}

第五章循环和关系表达式

**//ex.5.1**

#include <iostream>

int main()

{

using namespace std;

cout<<"Please enter two integers: ";

int num1,num2;

cin>>num1>>num2;

int sum=0;

for(int temp=num1;temp<=num2;++temp)//or temp++

sum+=temp;

cout<<"The sum from "<<num1<<" to "<<num2<<" is "<<sum<<endl;

return 0;

}

//ex.5.2

#include <iostream>

#include<array>

int main()

{

using namespace std;

array<long double,101>ad={0};

ad[1]=ad[0]=1L;

for(int i=2;i<101;i++)

ad[i]=i\*ad[i-1];

for(int i=0;i<101;i++)

cout<<i<<"! = "<<ad[i]<<endl;

return 0;

}

#include <iostream>

#include <array>

using namespace std;

int main()

{

array<long double, 101> multiply;

multiply[0] = multiply[1] = 1LL;

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

multiply[i] = multiply[i-1]\*i;

cout << multiply[100];

return 0;

}

//ex.5.3

#include <iostream>

int main()

{

using namespace std;

cout<<"Please enter an integer: ";

int sum=0,num;

while((cin>>num)&&num!=0)

{

sum+=num;

cout<<"So far, the sum is "<<sum<<endl;

cout<<"Please enter an integer: ";

}

return 0;

}

//ex.5.4

#include <iostream>

int main()

{

using namespace std;

double sum1,sum2;

sum1=sum2=0.0;

int year=0;

while(sum2<=sum1)

{

++year;

sum1+=10;

sum2=(100+sum2)\*0.05+sum2;

}

cout<<"经过"<<year<<"年后，Cleo 的投资价值才能超过Daphne 的投资价值。"<<endl;

cout<<"此时，Cleo 的投资价值为"<<sum1<<"，而Daphne 的投资价值为"<<sum2<<endl;

return 0;

}

#include <iostream>

using namespace std;

int main()

{

double Daphne = 100.0;

double Cleo = 100.0;

int year = 0;

while (Cleo <= Daphne)

{

Daphne += 10;

Cleo \*= 1.05;

year++;

} cout << year << endl;

return 0;

}

**//ex.5.5**

#include <iostream>

const int MONTHS = 12;

const char\*

months[MONTHS]={"January","February","March","April","May","June","July","August","Sept

ember","October","November","December"};

int main()

{

using namespace std;

int sales[MONTHS],sum=0;

for(int i=0;i<MONTHS;i++)

{

cout<<"请输入在"<<months[i]<<"的C++ For Fools的销售量：";

cin>>sales[i];

sum+=sales[i];

}

cout<<"这一年中的C++ For Fools的总销售量为："<<sum<<endl;

return 0;

}

//ex.5.6

#include <iostream>

const int MONTHS = 12;

const char\*

months[MONTHS]={"January","February","March","April","May","June","July","August","Sept

ember","October","November","December"};

const char\* years[3]={"第一年","第二年","第三年"};

int main()

{

using namespace std;

int year\_sale[3],sum=0,sales[3][MONTHS];

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

{

int temp=0;

cout<<years[i]<<"的每个月销售量:"<<endl;

for(int j=0;j<MONTHS;j++)

{

cout<<"请输入"<<months[j]<<"的销售量:";

cin>>sales[i][j];

temp+=sales[i][j];

}

year\_sale[i]=temp;

sum+=year\_sale[i];

}

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

cout<<years[i]<<"的销售量为："<<year\_sale[i]<<endl;

cout<<"这三年的总销售量为："<<sum<<endl;

return 0;

}

#include <iostream>

using namespace std;

const int Years = 3, Months = 12;

const char\* months[Months] =

{"January","February","March","April","May","June",

"July","August","September","October","November","December"};

int main()

{

int sale[Years][Months] = {0};

for (int i = 0; i < Years; i++)

{

int sum = 0;

for (int j = 0; j < Months; j++)

{

cout << "Enter the salesment of " << months[j] << ": ";

cin >> sale[i][j];

sum += sale[i][j];

} cout << "

Salesment for this year: "

<< sum << endl << endl;

} return 0;

}

//ex.5.7

#include <iostream>

#include <string>

using namespace std;

struct car{

string name;

int year;

};

int main()

{

cout<<"How many cars do you wish to catalog? ";

int num;

(cin>>num).get();

car\* ps=new car[num];

for(int i=0;i<num;++i)

{

cout<<"Car #"<<i+1<<":\n";

cout<<"Please enter the make: ";

getline(cin,ps[i].name);

cout<<"Please enter the year made: ";

(cin>>ps[i].year).get();

}

cout<<"Here is your collection:\n";

for(int i=0;i<num;++i)

cout<<ps[i].year<<" "<<ps[i].name<<endl;

delete [] ps;

return 0;

}

#include <iostream>

#include <string>

using namespace std;

struct car

{

string maker;

int year;

};

int main()

{

int number;

cout << "How many cars do you wish to catalog? ";

cin >> number;

car\* a = new car[number];

for (int i = 0; i < number; i++)

{

cout << "Car #" << i+1 << ": " << endl;

cout << "Please enter the maker: ";

cin.get();

getline(cin,a[i].maker);

cout << "Please enter the year made: ";

cin >> a[i].year;

}

cout << "Here is your collection: " << endl;

for (int i = 0; i < number; i++)

cout << a[i].year << " " << a[i].maker <<endl;

delete [] a;

return 0;

}

#include <iostream>

using namespace std;

struct car

{

char maker[20];

int year;

};

int main()

{

int number;

cout << "How many cars do you wish to catalog? ";

cin >> number;

car\* a = new car[number];

for (int i = 0; i < number; i++)

{

cout << "Car #" << i+1 << ": " << endl;

cout << "Please enter the maker: ";

cin.get();

cin.getline(a[i].maker, 20);

cout << "Please enter the year made: ";

cin >> a[i].year;

}

cout << "Here is your collection: " << endl;

for (int i = 0; i < number; i++)

cout << a[i].year << " " << a[i].maker <<endl;

delete [] a;

return 0;

}

//ex.5.8

#include <iostream>

#include <cstring>

int main()

{

using namespace std;

char word[20];

int sum=0;

cout<<"Enter words (to stop,type the word done):\n";

cin>>word;

while(strcmp(word,"done"))

{

sum++;

cin>>word;

}

cout<<"You entered a total of "<<sum<<" words.\n";

return 0;

}

//ex.5.9

#include <iostream>

#include <string>

int main()

{

using namespace std;

string word;

int sum=0;

cout<<"Enter words (to stop, type the word done):\n";

cin>>word;

while(word!="done")

{

sum++;

cin>>word;

}

cout<<"You entered a total of "<<sum<<" words.\n";

return 0;

}

和ex.5.8 的区别是：word != "done"，因为当word = done 一样时，返回值为1，不一样时

才是返回0.

//ex.5.10

#include <iostream>

int main()

{

using namespace std;

cout<<"Enter number of rows:";

int num;

cin>>num;

for(int i=0;i<num;i++)

{

for(int j=num-i;j>1;j--)

cout<<".";

for(int k=0;k<=i;++k)

cout<<"\*";

cout<<endl;

}

return 0;

}

第六章分支语句和逻辑运算符

**//ex.6.1**

#include <iostream>

#include <cctype>

int main()

{

using namespace std;

char ch;

cin.get(ch);

while(ch!='@')

{

if(isdigit(ch))

cin.get(ch);

else

{

if(islower(ch))

ch=toupper(ch);

else

ch=tolower(ch);

cout<<ch;

cin.get(ch);

}

}

return 0;

}

#include <iostream>

#include <cctype>

using namespace std;

int main()

{

char ch;

cout << "Please enter: \n";

while (cin.get(ch) && ch != '@')

{

if(islower(ch))

{

ch = toupper(ch);

cout << ch;

} else if(isupper(ch))

{

ch = tolower(ch);

cout << ch;

} else

cout << ch;

} return 0;

}

//ex.6.2--数组

#include <iostream>

#include<cctype>

int main()

{

using namespace std;

double sum=0,average=0;

double num[10];

int i=0,total=0;

double temp;

while(cin>>temp&&i<10&&!isdigit(temp))

{

num[i]=temp;

sum+=num[i];

++i;

}

if(i!=0)

average=sum/i;

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

if(num[j]>average)

++total;

cout<<"这些数字的平均值为"<<average<<endl;

cout<<"并且共有"<<total<<"个数字大于平均值。\n";

return 0;

}

#include <iostream>

using namespace std;

const int Num = 10;

int main()

{

double donation[Num];

int i = 0;

int count =0;

double sum = 0.0;

cout << "Please enter: \n";

while(i < Num && cin >> donation[i])

{

sum += donation[i++];

} if(i

== 0)

cout << "No data--bye \n";

else

{

double average = sum/i;

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

{

if(donation[j] > average)

++count;

} cout << "

The average =

"

<< average << endl

<< "The numbers bigger than the average: "

<< count << endl;

} return 0;

}

//ex.6.2--array

#include <iostream>

#include<cctype>

#include<array>

int main()

{

using namespace std;

double sum=0,average=0;

array<double,10>ad={0};

int i=0,total=0;

double temp;

while(cin>>temp&&i<10&&!isdigit(temp))

{

ad[i]=temp;

sum+=ad[i];

++i;

}

if(i!=0)

average=sum/i;

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

if(ad[j]>average)

++total;

cout<<"这些数字的平均值为"<<average<<endl;

cout<<"并且共有"<<total<<"个数字大于平均值。\n";

return 0;

}

**//ex.6.3**

#include <iostream>

int main()

{

using namespace std;

cout<<"Please enter one of the following choices:\n"

<<"c)carnivore p)pianist\n"

<<"t)tree g)game\nf\n"; //书上的这个f个人认为是打印错误

cout<<"Please enter a c, p, t, or g: ";

char ch;

cin>>ch;

while(ch!='c'&&ch!='p'&&ch!='t'&&ch!='g')

{

cout<<"Please enter a c, p, t, or g: ";

cin>>ch;

}

switch(ch)

{

case 'c':

cout<<"A maple is a carnivore.\n";

break;

case 'p':

cout<<"A maple is a pianist.\n";

break;

case 't':

cout<<"A maple is a tree.\n";

break;

case 'g':

cout<<"A maple is a game.\n";

}

return 0;

}

#include <iostream>

using namespace std;

void show();

int main()

{

show();

char choice;

while (cin >> choice)

{

switch(choice)

{ case '

c' :

cout << "

It's a

carnivore.\n";

break;

case 'p' : cout << "It's a pianist.\n";

break;

case 't' : cout << "A maple is a tree.\n";

break;

case 'g' : cout << "It's a game.\n";

break;

default : cout << "Please enter a c, p, t, or g:";

}

}

return 0;

}

void show()

{

cout << "Please enter one of the following choices: \n"

"c) carnivore p) pianist\n"

"t) tree g) game\n";

}

//ex.6.4

#include <iostream>

const int strsize=20;

struct bop{

char fullname[strsize];

char title[strsize];

char bopname[strsize];

int preference;

};

int main()

{

using namespace std;

cout<<"Benevolent Order of Programmers Report\n"

<<"a. display by name b. display by title\n"

<<"c. display by bopname d. diplay by preference\n"

<<"q. quit\n";

char ch;

bop member[5]={

{"Wimp Macho","English Teacher","DEMON",0},

{"Raki Rhodes","Junior Programmer","BOOM",1},

{"Celia Laiter","Super Star","MIPS",2},

{"Hoppy Hipman","Analyst Trainee","WATEE",1},

{"Pat Hand","Police","LOOPY",2}

};

cout<<"Enter your choice:";

while(cin>>ch&&ch!='q')

{

switch(ch)

{

case 'a':

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

cout<<member[i].fullname<<endl;

break;

case 'b':

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

cout<<member[i].title<<endl;

break;

case 'c':

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

cout<<member[i].bopname<<endl;

break;

case 'd':

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

{

if(member[i].preference==0)

cout<<member[i].fullname<<endl;

else if(member[i].preference==1)

cout<<member[i].title<<endl;

else if(member[i].preference==2)

cout<<member[i].bopname<<endl;

}

break;

}

cout<<"Next choice: ";

}

cout<<"Bye!\n";

return 0;

}

#include <iostream>

using namespace std;

const int strsize = 30;

struct bop{

char fullname[strsize];

char title[strsize];

char bopname[strsize];

int preference;

};

void show();

int main()

{

bop A[5] =

{

{"Wimp Macho", "Teacher", "HAHA", 0},

{"Raki Rhodes", "Junior Programmer", "LIAR", 1},

{"Celia", "engineer", "MIPS", 2},

{"Hoppy Hipman", "Analyst Trainee", "WAHU", 1},

{"Pat Hand", "Student", "LOOPY", 2}

};

cout << "Benevolent Order of Programmers Report\n";

show();

cout << "Enter your choice: ";

char choice;

cin >> choice;

while (choice != 'q')

{

switch(choice)

{ case 'a' :

cout << A[0].fullname << endl << A[1].fullname << endl

<< A[2].fullname << endl << A[3].fullname << endl

<< A[4].fullname << endl;

break;

case 'b' : cout << A[0].title << endl << A[1].title << endl

<< A[2].title << endl << A[3].title << endl

<< A[4].title << endl;

break;

case 'c' : cout << A[0].bopname << endl << A[1].bopname << endl

<< A[2].bopname << endl << A[3].bopname << endl

<< A[4].bopname << endl;

break;

case 'd' : cout << A[0].fullname << endl << A[1].title << endl

<< A[2].bopname << endl << A[3].title << endl

<< A[4].bopname << endl;

break;

default : cout << "That's not the proper choice.\n";

} cout << "

Next choice: ";

cin >> choice;

} cout << "

Bye!\n";

return 0;

} void show()

{

cout << "a. display by name b. display by title\n"

<< "c. display by bopname d. display by preference\n"

<< "q. quit\n";

}

//ex.6.5

#include <iostream>

int main()

{

using namespace std;

double income,revenue;

cout<<"请输入你的收入：";

while(cin>>income&&income>=0)

{

if(income<=5000)

revenue=0.0;

else if(income<=15000)

revenue=0.1\*(income-5000);

else if(income<=35000)

revenue=0.1\*(15000-5000)+0.15\*(income-15000);

else

revenue=0.1\*(15000-5000)+0.15\*(35000-15000)+0.2\*(income-35000);

cout<<"你的所得税为"<<revenue<<endl;

cout<<"请输入你的收入：";

}

return 0;

}

#include <iostream>

using namespace std;

int main()

{

double income,tax;

cout << "Please enter your income: ";

while (cin >> income && income >= 0)

{

if(income <= 5000)

tax = 0;

else if(income <= 15000)

tax = 0.1\*(income - 5000);

else if(income <= 35000)

tax = 10000\*0.1 + 0.15\*(income - 15000);

else

tax = 10000\*0.1 + 0.15\*20000 + 0.2\*(income - 35000);

cout << "Your tax is: " << tax << endl;

cout << "Please enter your income: ";

} cout << "

Bye!\n";

return 0;

}/

/ex.6.6

#include <iostream>

#include <string>

using namespace std;

struct patron{

string name;

double money;

};

int main()

{

int num,temp=0;

cout<<"请输入捐款的人数：";

cin>>num;

cin.get();

patron \*ps=new patron[num];

for(int i=0;i<num;++i)

{

cout<<"请输入第"<<i+1<<"位捐款人的名字：";

getline(cin,ps[i].name);

cout<<"请输入第"<<i+1<<"位捐款人捐款的数目：";

cin>>ps[i].money;

cin.get();

}

cout<<"Grand Patrons:\n";

for(int i=0;i<num;++i)

if(ps[i].money>10000)

{

cout<<ps[i].name<<"\n"<<ps[i].money<<endl;

++temp;

}

if(temp==0)

cout<<"none\n";

cout<<"Patrons:\n";

for(int i=0;i<num;++i)

if(ps[i].money<=10000)

{

cout<<ps[i].name<<"\n"<<ps[i].money<<endl;

++temp;

}

if(temp==0)

cout<<"none\n";

delete [] ps;

return 0;

}

#include <iostream>

#include <string>

using namespace std;

struct charity

{

string name;

double money;

};

int main()

{

int number;

int count = 0;

cout << "Please enter the number of donator: ";

cin >> number;

charity \*pt = new charity[number];

for (int i = 0; i < number; i++)

{

cout << "Please enter your name: ";

cin.get();

getline(cin, pt[i].name);

cout << "Please enter the money you are going to donate: ";

cin >> pt[i].money;

if(pt[i].money > 10000)

count++;

} if(count == 0)

cout << "None(money > 10000)";

else

{

cout << "Grand Patron\n";

for(int i = 0; i < number; i++)

{

if(pt[i].money > 10000)

cout << pt[i].name << " " << pt[i].money << endl;

}

} cout << endl;

if(10 - count == 0)

cout << "None(money < 10000)";

else

{

cout << "Patron\n";

for(int i = 0; i < number; i++)

{

if(pt[i].money < 10000)

cout << pt[i].name << " " << pt[i].money << endl;

}

} return 0;

}

//ex.6.7

#include <iostream>

#include <cctype>

int main()

{

using namespace std;

int vowel=0,consonant=0,other=0;

char word[15];

cout<<"Enter words (q to quit):\n";

while(cin>>word)

{

if(isalpha(word[0]))

{

if(word[0]=='q'&&strlen(word)==1)

break;

else if(word[0]=='a'||word[0]=='i'||

word[0]=='u'||word[0]=='e'||word[0]=='o')

++vowel;

else

++consonant;

}

else

++other;

}

cout<<vowel<<" words beginning with vowels\n";

cout<<consonant<<" words beginning with consonants\n";

cout<<other<<" others\n";

return 0;

}

#include <iostream>

#include <cctype>

using namespace std;

int main()

{

char word[20];

int vow = 0, consonant = 0, other =0;

cout << "Enter words (q to quit):\n";

while(cin >> word)

{

if (isalpha(word[0]))

{

if(word[0] == 'a' || word[0] == 'e' || word[0] == 'i'|| word[0]

== 'o' || word[0] == 'u' ||

word[0] == 'A' || word[0] == 'E' || word[0] == 'I' || word[0] ==

'O' || word[0] == 'U')

vow++;

else if(word[0] == 'q' && strlen(word) == 1)

break;

else

consonant++;

} else

other++;

} cout << vow << "

words beginning with vowels\n"

<< consonant << " words beginning with consonants\n"

<< other << " others\n";

return 0;

}

//ex.6.8

#include <iostream>

#include <fstream>

#include <cstdlib>

int main()

{

using namespace std;

char ch;

int sum=0;

ifstream inFile;

inFile.open("abc.txt");

if(!inFile.is\_open())

{

cout<<"Could not open the file \n";

cout<<"Program terminating.\n";

exit(EXIT\_FAILURE);

}

inFile>>ch;

while(inFile.good())

{

++sum;

inFile>>ch;

}

if(inFile.eof())

cout<<"End of file reached.\n";

else if(inFile.fail())

cout<<"Input terminated by data mismatch.\n";

else

cout<<"Input terminated for unkonwn reason.\n";

cout<<"总共有"<<sum<<"个字符在这个文件中。"<<endl;

return 0;

}

#include <iostream>

#include <fstream>

#include <cstdlib>

using namespace std;

const int Size = 20;

int main()

{

char filename[Size];

ifstream infile;

cout << "Enter name of data file: ";

cin.getline(filename, Size);

infile.open(filename);

if (!infile.is\_open())

{

cout << "Could not open the file " <<filename << endl;

cout << "Program terminating.\n";

exit(EXIT\_FAILURE);

} char a;

int count = 0;

infile >> a;

while (infile.good())

{

++count;

infile >> a;

} if (

infile.eof())

cout << "End of file reached.\n";

else if (infile.fail())

cout << "Input terminated by data mismatch.\n";

else

cout << "Input terminated for unknown reason.\n";

if (count == 0)

cout << "No data processed.\n";

else

cout << "The text contains " << count << " character(s)" << endl;

infile.close();

return 0;

}

//ex.6.9

#include <iostream>

#include <fstream>

#include <cstdlib>

struct member

{

char name[20];

double donation;

};

int main()

{

using namespace std;

int num,count1=0,count2=0;

ifstream fin;

char file[20];

cout<<"Enter name of data file: ";

cin.getline(file,20);

fin.open(file);

if(!fin.is\_open())

{

cout<<"Could not open the file-"<<file<<endl;

cout<<"Program terminating.\n";

exit(EXIT\_FAILURE);

}

fin>>num;

fin.get();

member \*pd=new member[num];

for(int i=0;i<num;i++)

{

fin.getline(pd[i].name,20);

fin>>pd[i].donation;

fin.get();

}

cout<<"Grand Patrons:\n";

for(int i=0;i<num;i++)

if(pd[i].donation>=10000)

{

cout<<pd[i].name<<"\n"<<pd[i].donation<<endl;

count1++;

}

if(count1==0)

cout<<"none\n";

cout<<"Patrons:\n";

for(int i=0;i<num;i++)

if(pd[i].donation<10000)

{

cout<<pd[i].name<<"\n"<<pd[i].donation<<endl;

count2++;

}

if(count2==0)

cout<<"none\n";

delete [] pd;

return 0;

}

#include <iostream>

#include <fstream>

#include <cstdlib>

#include <string>

using namespace std;

struct charity

{

string name;

double money;

};

int main()

{

string filename;

ifstream infile;

cout << "Enter name of data file: ";

getline(cin, filename);

infile.open(filename);

if (!infile.is\_open())

{

cout << "Could not open the file " <<filename << endl;

cout << "Program terminating.\n";

exit(EXIT\_FAILURE);

}

int number,count = 0;

infile >> number;

charity \*pt = new charity[number];

for (int i = 0; i < number; i++)

{

infile.get();

getline(infile, pt[i].name);

infile >> pt[i].money;

if(pt[i].money > 10000)

count++;

} if(count == 0)

cout << "None(money > 10000)";

else

{

cout << "Grand Patron:\n";

for(int i = 0; i < number; i++)

{

if(pt[i].money > 10000)

cout << pt[i].name << " " << pt[i].money << endl;

}

} if(10 -

count == 0)

cout << "None(money < 10000)";

else

{

cout << "Patron:\n";

for(int i = 0; i < number; i++)

{

if(pt[i].money < 10000)

cout << pt[i].name << " " << pt[i].money << endl;

}

} delete [] pt;

return 0;

}

第**7** 章函数**——C++**的

编程模块

**//ex7.1** #include <iostream>

double t\_av(double x, double y);

int main()

{ using namespace std;

double x, y;

double result;

cout << "Please enter two numbers (0 to stop): ";

while ((cin >> x >> y) && x != 0 && y != 0)

{ result =

t\_av(x, y);

cout << "调和平均数= " << result << endl;

cout << "Please enter two numbers (0 to stop): ";

} return 0;

} double t\_av(double x, double y)

{ return 2.0 \*

x

\*

y

/

(

x

+

y);

}

#include <iostream>

using namespace std;

void average(double, double);

int main()

{

double A, B;

cout << "Please enter two numbers: ";

while (cin >> A >> B)

{

if (A == 0 || B == 0)

break;

else

average(A, B);

cout << "Please enter two numbers: ";

} cout << "

Bye!\n";

return 0;

} void average(double x, double y)

{

cout << "The average is: "

<< 2.0 \* x \* y / (x + y)

<< endl;

}

//ex7.2

#include <iostream>

const int MAX = 10;

using namespace std;

int fill\_ar(double ar[], int limit);

void show\_ar(const double ar[], int n);

double average(const double ar[], int n);

int main()

{

double scores[MAX];

int size = fill\_ar(scores, MAX);

show\_ar(scores, size);

if (size > 0)

cout << "The average of scores is: "<< average(scores, size) << endl;

return 0;

}

int fill\_ar(double ar[], int limit)

{

double temp;

int i;

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

{

cout << "Enter score #" << i+1 << ": ";

cin >> temp;

if (!cin)

{

cin.clear();

while (cin.get() != '\n')

continue;

cout << "Bad input; enter a number: ";

break;

}

if ( temp < 0 )

break;

ar[i] = temp;

}

return i;

}

void show\_ar(const double ar[], int n)

{

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

cout << "score #" << i+1 << ": " << ar[i] << endl;

}

double average(const double ar[], int n)

{

double sum =0.0;

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

sum += ar[i];

return sum / n;

}

#include <iostream>

using namespace std;

double score[10];

int input(double [], int);

void average(double [], int);

void show(const double[], int);

int main()

{

int size = input(score, 10);

if (size > 0)

{

show(score, size);

average(score, size);

} cout << "

Done.\n";

return 0;

} int input(double score[], int limit)

{

double a;

int i;

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

{

cout << "Your score: ";

cin >> a;

if (!cin)

{

cin.clear();

while (cin.get() != '\n')

continue;

cout << "Bad input; input process terminated.\n";

break;

} else if (

a

<

0)

break;

score[i] = a;

} return i;

} void show(const double ar[], int n)

{

double total = 0.0;

cout << "Score: ";

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

{

cout << ar[i] << " ";

} cout << endl;

} void average(double ar[], int n)

{

double av,total = 0.0;

int i;

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

{

total += ar[i];

} av =

total /

i;

cout << "The average score: " << av << endl;

}

//ex7.3

#include <iostream>

long double probability(unsigned numbers, unsigned picks);

int main()

{

using namespace std;

double total, choices, mtotal;

long double probability1, probability2;

cout << "Enter total number of game card choices and\n"<<"number of picks allowed for the field:\n";

while ((cin >> total >> choices) && choices < total)

{

cout << "Enter total number of game card choices and\n"<<"number of picks allowed for the mega:\n";

if (!(cin >> mtotal))

break;

probability1 = probability(total, choices);

probability2 = probability(mtotal, 1);

cout << "The chances of getting all " << choices << " picks is one in "<< probability1 << ".\n";

cout << "The chances of getting the megaspot is one in "<< probability2 << ".\n";

cout << "You have one chance in ";

cout << probability1 \* probability2;

cout << " of winning.\n";

cout << "Next set of numbers (q to quit): ";

}

cout << "bye\n";

return 0;

}

long double probability(unsigned numbers, unsigned picks)

{

long double result =1.0;

long double n;

unsigned p;

for (n = numbers, p = picks; p > 0; n--, p--)

result = result \* n / p;

return result;

}

#include <iostream>

using namespace std;

long double probability1(unsigned, unsigned);

long double probability2(unsigned);

int main()

{

double a, b, c;

cout << "Enter the number of choices on the game card and\n"

<< "the number of picks allowed(in 1 field number):\n";

cin >> a >> b;

cout << "Enter the number of choices on the game card \n"

<< "(in 2 field number):\n";

cin >> c;

while (cin)

{

if (b <= a)

{

long double chance;

chance = probability1(a, b) \* probability2(c);

cout << "You have one chance in "

<< chance << " of wining.\n\n";

cout << "Enter the number of choices on the game card and\n"

<< "the number of picks allowed(in 1 field number):\n";

cin >> a >> b;

if (!cin)

break;

cout << "Enter the number of choices on the game card \n"

<< "(in 2 field number):\n";

cin >> c;

}

else

break;

} cout << "

Bye!\n";

return 0;

} long double probability1(unsigned numbers, unsigned picks)

{

long double result = 1.0;

long double n;

unsigned p;

for (n = numbers, p = picks; p > 0; n--, p--)

result = result \* n / p;

return result;

} long double probability2(unsigned numbers)

{

long double result;

result = 1.0 / numbers;

return result;

}

**//ex7.5**

#include <iostream>

long long int recure(int);

int main()

{ using namespace std;

int number;

cout << "Enter a integer (q to stop): ";

while (cin >> number)

{ long long int result =

recure(number);

cout << number << "! = " << result << endl;

cout << "Next:";

} cout << "

Done!" << endl;

return 0;

} long long int recure(int n)

{ long long int result;

if (n > 0)

result = n \* recure(n-1);

else

result = 1;

return result;

}

#include <iostream>

using namespace std;

unsigned long sub(int);

int main()

{

cout << "Enter one integer: (q to quit)";

int num;

while(cin >> num)

{

unsigned long result = sub(num);

cout << "The result of " << num << "! is: "

<< result << endl

<< "Next number: ";

} return 0;

} unsigned long sub(int n)

{

unsigned long result = n;

if (result > 0)

result = result \* sub(n - 1);

else

result = 1;

return result;

}

//ex7.6

#include <iostream>

const int Size = 10;

int Fill\_array(double ar[], int n);

void Show\_array(const double ar[], int n);

void Reverse\_array(double ar[], int n);

int main()

{

using namespace std;

double values[Size];

int len = Fill\_array(values, Size);

cout << "Array values:\n";

Show\_array(values, len);

cout << "Array reversed:\n";

Reverse\_array(values, len);

Show\_array(values, len);

cout << "All but end values reversed:\n";

Reverse\_array(values+1, len-2);

Show\_array(values, len);

return 0;

}

int Fill\_array(double ar[], int n)

{

using namespace std;

double temp;

int i;

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

{

cout << "Enter value #" << i+1<< ": ";

cin >> temp;

if (!cin)

break;

ar[i] = temp;

}

cout << endl;

return i;

}

void Show\_array(const double ar[], int n)

{

using namespace std;

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

cout << "Property #" << i+1 << ": "<< ar[i] << endl;

cout << endl;

}

void Reverse\_array(double ar[], int n)

{

double temp;

for (int i=0,j=n-1; i<j; i++,j--)

{

temp =ar[i];

ar[i] = ar[j];

ar[j] = temp;

}

}

#include <iostream>

using namespace std;

const int Asize = 10;

int Fill\_array(double [], int);

void Show\_array(double [], int);

double \* Reverse\_array(double [], int, int);

int main()

{

double numbers[Asize];

cout << "Please enter some numbers(less than ten): \n";

int i = Fill\_array(numbers, Asize);

cout << "You've entered " << i << " numbers:\n";

Show\_array(numbers, i);

cout << endl;

double \* pt = Reverse\_array(numbers, 0, i);

Show\_array(pt, i);

cout << endl;

double \* ps = Reverse\_array(numbers, 1, i);

Show\_array(ps, i);

cout << endl;

return 0;

}

int Fill\_array(double ar[], int size)

{

int i;

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

{

if (cin >> ar[i]);

else

break;

}

return i;

}

void Show\_array(double ar[], int size)

{

for (int i = 0; i < size; i++)

cout << ar[i] << " ";

}

double \*Reverse\_array(double ar[], int a, int size)

{

cout << "Here are(is) the number(s) after reverse:\n";

double temp;

for (int i = a; i < size / 2; i++)

{

temp = ar[i];

ar[i] = ar[size - i - 1];

ar[size - i - 1] = temp;

}

return ar;

}

//ex7.7

#include <iostream>

const int Max = 5;

double \* fill\_array(double \* begin, double \* end);

void show\_array(const double \* begin, const double \* end);

void revalue(double r, double \* begin, double \* end);

int main()

{ using namespace std;

double properties[Max];

double \* pbegin = properties;

double \* pend = fill\_array(pbegin, pbegin + Max);

show\_array(pbegin, pend);

if (pend-pbegin > 0)

{ cout << "

Enter revaluation factor: ";

double factor;

while (!(cin >> factor))

{ cin.clear();

while (cin.get() != '\n')

continue;

cout << "Bad input; Please enter a number: ";

} revalue(factor, pbegin, pend);

show\_array(pbegin, pend);

} cout << "

Done.\n";

return 0;

} double \*

fill\_array(double \*

begin, double \*

end)

{ using namespace std;

double temp;

int i = 1;

while (begin < end)

{ cout << "

Enter value #" << i

<< ": ";

cin >> temp;

if (!cin)

{ cin.clear();

while (cin.get() != '\n')

continue;

cout << "Bad input; input process terminated.\n";

break;

} else if (

temp <

0)

break;

\*begin = temp;

begin++;

i++;

} return begin;

} void show\_array(const double \* begin, const double \*

end)

{ using namespace std;

int i = 1;

while (begin < end)

{ cout << "

Property #" << i

<< ": $";

cout << \*begin << endl;

begin++;

i++;

}}

void revalue(double r, double \* begin, double \* end)

{ while (

begin <

end)

{ \*

begin \*= r;

begin++;

}}

#include <iostream>

using namespace std;

const int Max = 5;

void show\_array(const double [], double \*);

void revalue(double, double [], double \*);

double \* fill\_array(double [], int);

int main()

{

double properties[Max];

double \* p = fill\_array(properties, Max);

show\_array(properties, p);

if (p != &properties[0])

{

cout << "Enter revaluation factor: ";

double factor;

while (!(cin >> factor))

{

cin.clear();

while (cin.get() != '\n')

continue;

cout << "Bad input; Please enter a number: ";

} revalue(factor, properties, p);

show\_array(properties, p);

} cout << "

Done.\n";

return 0;

} double \*

fill\_array(double ar[], int n)

{

double temp;

int i;

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

{

cout << "Enter value #" << (i + 1) << ": ";

cin >> temp;

if (!cin)

{

cin.clear();

while (cin.get() != '\n')

continue;

cout << "Bad input; input process terminated.\n";

break;

} else if (

temp <

0)

break;

ar[i] = temp;

} double \*

pt =

&

ar[i

-

1];

return pt;

} void show\_array(const double ar[], double \*

ps)

{

const double \* p = &ar[0];

for (int i = 0; p != ps + 1; p++,i++)

{

cout << "Property #" << (i + 1) << ": $";

cout << ar[i] << endl;

}

} void revalue(double r, double ar[], double \*

ps)

{

double \* p = &ar[0];

for (int i = 0; p != ps + 1; p++, i++)

ar[i] \*= r;

}

//ex7.8a

#include <iostream>

const int Seasons = 4;

const char \* Snames[] = {"Spring", "Summer", "Fall", "Winter"};

void fill(double ar[], int n);

void show(double ar[], int n);

int main()

{ using namespace std;

double expenses[Seasons];

fill(expenses, Seasons);

show(expenses, Seasons);

return 0;

} void fill(double ar[], int n)

{ using namespace std;

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

{ cout << "

Enter "

<< Snames[i] << "

expenses: ";

cin >> ar[i];

}} void show(double ar[], int n)

{ using namespace std;

cout << "\nEXPENSES\n";

double total = 0.0;

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

{ cout << Snames[i] << ": $" << ar[i] <<endl;

total += ar[i];

} cout << "

Total Expenses: $" << total << endl;

}

#include <iostream>

using namespace std;

const char \* Seasons[4] = {"Spring", "Summer", "Fall", "Winter"};

void fill(double \*);

void show(double []);

int main()

{

double expenses[4];

fill(expenses);

show(expenses);

return 0;

} void fill(double ar[])

{

double costs;

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

{

cout << "Enter " << Seasons[i] << " expenses: ";

cin >> ar[i];

}

} void show(double ar[])

{

double total = 0.0;

cout << "\nEXPENSES\n";

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

{

cout << Seasons[i] << ": $" << ar[i] << endl;;

total += ar[i];

} cout << "

Total Expenses: $" << total << endl;

}

//ex7.8b（传递结构值）

#include <iostream>

const int Seasons = 4;

struct data

{ double arr[Seasons];

};

const char \* Snames[] = {"Spring", "Summer", "Fall", "Winter"};

data fill();

void show(data);

int main()

{ using namespace std;

data expenses = fill();

show(expenses);

return 0;

} data fill()

{ using namespace std;

data expenses;

for (int i=0; i<Seasons; i++)

{ cout << "

Enter " << Snames[i] << "

expenses: ";

cin >> expenses.arr[i];

} return expenses;

} void show(data expenses)

{

using namespace std;

cout << "\nEXPENSES\n";

double total = 0.0;

for (int i=0; i<Seasons; i++)

{ cout << Snames[i] << ": $" << expenses.arr[i] <<endl;

total += expenses.arr[i];

} cout << "

Total Expenses: $" << total << endl;

}

//ex7.8b（传递结构指针）

#include <iostream>

const int Seasons = 4;

struct data

{ double arr[Seasons];

};

const char \* Snames[] = {"Spring", "Summer", "Fall", "Winter"};

void fill(data \* pd);

void show(data \* pd);

int main()

{ using namespace std;

data expenses;

fill(&expenses);

show(&expenses);

return 0;

} void fill(data \*

pd)

{ using namespace std;

for (int i=0; i<Seasons; i++)

{ cout << "

Enter "

<< Snames[i] << "

expenses: ";

cin >> pd->arr[i];

}} void show(data \* pd)

{ using namespace std;

cout << "\nEXPENSES\n";

double total = 0.0;

for (int i=0; i<Seasons; i++)

{

cout << Snames[i] << ": $" << pd->arr[i] <<endl;

total += pd->arr[i];

} cout << "

Total Expenses: $" << total << endl;

}

#include <iostream>

using namespace std;

const char \* Seasons[4] = {"Spring", "Summer", "Fall", "Winter"};

struct expenditure

{

double expenses[4];

};

expenditure fill(expenditure);

void show(expenditure);

int main()

{

expenditure a = {{0.0}};

expenditure v = fill(a);

show(v);

return 0;

} expenditure fill(expenditure b)

{

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

{

cout << "Enter " << Seasons[i] << " expenses: ";

cin >> b.expenses[i];

} return b;

} void show(expenditure b)

{

double total = 0.0;

cout << "\nEXPENSES\n";

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

{

cout << Seasons[i] << ": $" << b.expenses[i] << endl;

total += b.expenses[i];

} cout << "

Total Expenses: $" << total << endl;

}

**//ex7.9**

#define \_CRT\_SECURE\_NO\_WARNINGS

#include <iostream>

using namespace std;

const int SLEN = 30;

struct student {

char fullname[SLEN];

char hobby[SLEN];

int ooplevel;

};

int getinfo(student pa[], int n);

void display1(student st);

void display2(const student \* ps);

void display3(const student pa[], int n);

int main()

{

cout << "Enter class size: ";

int class\_size;

cin >> class\_size;

while (cin.get() != '\n')

continue;

student \* ptr\_stu = new student[class\_size];

int entered = getinfo(ptr\_stu, class\_size);

for (int i = 0; i < entered; i++)

{

display1(ptr\_stu[i]);

display2(&ptr\_stu[i]);

}

display3(ptr\_stu, entered);

delete [] ptr\_stu;

cout << "Done\n";

return 0;

}

// getinfo() has two arguments: a pointer to the first element of

// an array of student structures and an int representing the

// number of elements of the array. The function solicits and

// stores data about students. It terminates input upon filling

// the array or upon encountering a blank line for the student

// name. The function returns the actual number of array elements

// filled.

int getinfo(student pa[], int n)

{

int num\_array\_elem =n;

char tmp[SLEN];

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

{

cout << "Enter name: ";

cin.getline(tmp, SLEN);

bool blank\_line = true;

for (unsigned j = 0; j < strlen(tmp); ++j)

{

if (!isspace(tmp[j]))

{

blank\_line =false;

break;

}

}

if (blank\_line)

{

num\_array\_elem =i;

break;

}

strcpy(pa[i].fullname, tmp);

cout << "Enter hobby: ";

cin.getline(pa[i].hobby, SLEN);

cout << "Enter ooplevel: ";

cin >> pa[i].ooplevel;

cin.get();

}

cout << endl;

return num\_array\_elem;

}

// display1() takes astudent structure as an argument

// and displays its contents

void display1(student st)

{

cout << st.fullname << '\t' << st.hobby << '\t' << st.ooplevel <<endl;

}

// display2() takes the address of student structure as an

// argument and displays the structure’¡¥s contents

void display2(const student \* ps)

{

cout << ps->fullname << '\t' << ps->hobby << '\t' << ps->ooplevel<< endl;

}

// display3() takes the address of the first element of an array

// of student structures and the number of array elements as

// arguments and displays the contents of the structures

void display3(const student pa[], int n)

{

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

cout << pa[i].fullname << '\t' << pa[i].hobby << '\t' <<pa[i].ooplevel << endl;

}

#include <iostream>

using namespace std;

const int SLEN = 30;

struct student {

char fullname[SLEN];

char hobby[SLEN];

int ooplevel;

};

int getinfo(student pa[], int n);

void display1(student st);

void display2(const student \* ps);

void display3(const student pa[], int n);

int main()

{

cout << "Enter class size: ";

int class\_size;

cin >> class\_size;

while (cin.get() != '\n')

continue;

student \* ptr\_stu = new student[class\_size];

int entered = getinfo(ptr\_stu, class\_size);

for (int i = 0; i < entered; i++)

{

display1(ptr\_stu[i]);

display2(&ptr\_stu[i]);

} display3(ptr\_stu, entered);

delete [] ptr\_stu;

cout << "Done\n";

return 0;

} int getinfo(student \*

p, int num)

{

int i;

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

{

cout << "Enter the fullname: ";

cin.getline((p + i)->fullname, SLEN);

cout << "Enter the hobby: ";

cin.getline((p + i)->hobby, SLEN);

cout << "Enter the ooplevel: ";

cin >> (p + i)->ooplevel;

if (!cin)

break;

else

cin.get();

} return i;

} void display1(student st)

{

cout << st.fullname << " "

<< st.hobby << " "

<< st.ooplevel << endl;

} void display2(const student \*

ps)

{

cout << ps->fullname << " "

<< ps->hobby << " "

<< ps->ooplevel << endl;

} void display3(const student pa[], int num)

{

for (int i = 0; i < num; i++)

{

cout << pa[i].fullname << " "

<< pa[i].hobby << " "

<< pa[i].ooplevel << endl;

}

}

//ex7.10

#include <iostream>

double calculate(double x, double y, double (\*pf)(double, double));

double add(double x, double y);

double sub(double x, double y);

double mean(double x, double y);

int main()

{

using namespace std;

double a, b;

double (\*pf[3])(double, double) = {add, sub, mean};

char \* op[3] = {"add", "sub", "mean"};

cout << "Enter pairs of numbers (q to quit): ";

while (cin >> a >> b)

{

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

{

cout << op[i] << ": "<< a<< "and "<< b<< "="<< calculate(a, b, pf[i]) << endl;

}

}

}

double calculate(double x, double y, double (\*pf)(double, double))

{

return (\*pf)(x, y);

}

double add(double x, double y)

{

return x+y;

}

double sub(double x, double y)

{

return x-y;

}

double mean(double x, double y)

{

return (x+y) /2.0;

}

第8 章函数探幽

**//ex8.1**

#include <iostream>

void show(const char \* ps, int n = 0);

int main()

{

using namespace std;

char \* pstr = "Hello\n";

show(pstr);

int num;

cout << "Enter a number: ";

cin >> num;

show(pstr, num);

cout << "Done\n";

return 0;

} void show(const char \*

ps, int n)

{ using namespace std;

int lim = n;

if (n == 0)

lim = 1;

for (int i=0; i<lim; i++)

cout << ps;

}

//ex8.2

#include <iostream>

#include <string>

using namespace std;

struct CandyBar

{ string name;

double weight;

int hot;

};

void set(CandyBar & cb, char \* ps, double w, int h);

void show(const CandyBar & cb);

int main()

{ using namespace std;

CandyBar candy;

char \* p = "Millennium Munch";

double x = 2.85;

int y = 350;

set(candy, p, x, y);

show(candy);

return 0;

} void set(CandyBar &

cb, char \*

ps, double w, int h)

{

cb.name = ps;

cb.weight = w;

cb.hot = h;

} void show(const CandyBar &

cb)

{ cout << "

Name: "

<< cb.name << endl

<< "Weight: " << cb.weight << endl

<< "Hot: " << cb.hot << endl;

}

#include <iostream>

#include <string>

using namespace std;

struct CandyBar {

string brand;

double weight;

int calories;

};

void function(CandyBar &, char \* str = "Millennium Munch", double a = 2.85,

int b = 350);

void show(const CandyBar &);

int main()

{

CandyBar x;

cout << "Please enter the brand: \n";

getline(cin, x.brand);

cout << "Please enter the weight: \n";

cin >> x.weight;

cout << "Please enter the colories: \n";

cin >> x.calories;

show(x);

function(x);

show(x);

return 0;

} void show(const CandyBar &

a)

{

cout << endl << a.brand << endl

<< a.weight << endl

<< a.calories << endl;

} void function(CandyBar &

r, char \*

str, double a, int b)

{

r.brand = str;

r.weight = a;

r.calories = b;

}

//ex8.3

#include <iostream>

#include <string>

#include <cctype>

using namespace std;

void str\_to\_upper(string & str);

int main()

{

string str1;

cout << "Enter a string (q to quit): ";

while (getline(cin, str1) && str1!="q" && str1!="Q")

{

str\_to\_upper(str1);

cout << str1 << endl;

cout << "Next string (q to quit): ";

}

cout << "Bye.";

return 0;

}

void str\_to\_upper(string &str)

{

int limit =str.size();

for (int i=0; i<limit; i++)

{

if (isalpha(str[i]))

str[i] = toupper(str[i]);

}

}

#include <iostream>

#include <string>

#include <cctype>

using namespace std;

void upper(string &);

int main()

{

string str;

cout << "Enter a string (q to quit): ";

getline(cin, str);

while (str != "q" && str != "Q")

{

upper(str);

cout << str << endl;

cout << "Next string (q to quit): ";

getline(cin, str);

} cout << "

Bye.\n";

return 0;

} void upper(string &

a)

{

for (int i = 0; i < a.size(); i++)

{

if (islower(a[i]))

a[i] = toupper(a[i]);

}

}

// ex8.4

//#define \_CRT\_SECURE\_NO\_WARNINGS

//#include <iostream>

//#include <cstring> // for strlen(), strcpy()

//using namespace std;

//

//struct stringy {

//char \* str; // points to a string

//int ct; // length of string (not counting '\0')

//};

//void show(const char \*str, int cnt = 1);

//void show(const stringy & bny, int cnt = 1);

//void set(stringy & bny, const char \* str);

//

//int main(void)

//{

// stringy beany;

// char testing[] = "Reality isn't what it used to be.";

// set(beany, testing); // first argument is a reference,

//// allocates space to hold copy of testing,

//// sets str member of beany to point to the

//// new block, copies testing to new block,

//// and sets ct member of beany

// show(beany); // prints member string once

// show(beany, 2); // prints member string twice

// testing[0] = 'D';

// testing[1] = 'u';

// show(testing); // prints testing string once

// show(testing, 3); // prints testing string thrice

// show("Done!");

// return 0;

//}

//

//void show(const char \*str, int cnt)

//{

// while(cnt-- >0)

// {

// cout << str << endl;

// }

//}

//

//void show(const stringy &bny, int cnt)

//{

// while(cnt-- >0)

// {

// cout << bny.str << endl;

// }

//}

//

//void set(stringy &bny, const char \*str)

//{

// bny.ct =strlen(str);

// bny.str = new char[bny.ct+1];

// strcpy(bny.str, str);

//}

#include <iostream>

using namespace std;

#include <cstring>

struct stringy {

char \* str;

int ct;

};

void set(stringy &, char []);

void show(const stringy &, int n = 1);

void show(const char [], int n = 1);

int main()

{

stringy beany;

char testing[] = "Reality isn't what it used to be.";

set(beany, testing);

show(beany);

show(beany, 2);

testing[0] = 'D';

testing[1] = 'u';

show(testing);

show(testing, 3);

show("Done!");

return 0;

}

void set(stringy &a, char b[])

{

a.str = b;

}

void show(const stringy &x, int n)

{

for (int i = n; i > 0; i--)

cout << x.str << endl;

}

void show(const char a[], int n)

{

for (int i = n; i > 0; i--)

cout << a << endl;

}

//ex8.5

#include <iostream>

const int Limit = 5;

template <typename T>

T max5(T ar[]);

int main()

{

using namespace std;

int ari[Limit] = {1, 2, 3, 5, 4};

double ard[Limit] = {1.1, 2.2, 3.3, 5.5, 4.4};

int maxi = max5(ari);

double maxd = max5(ard);

cout << "maxi = " << maxi << endl;

cout << "maxd = " << maxd << endl;

return 0;

}

template <typename T>

T max5(T ar[])

{

T max = ar[0];

for (int i=1; i<Limit; i++)

{

if (max <ar[i])

max = ar[i];

}

return max;

}

#include <iostream>

using namespace std;

const int Num = 5;

template <class AnyType>

AnyType max5(AnyType []);

int main()

{

int a[Num] = {1, 2, 3, 4, 5};

double b[Num] = {1.1, 2.2, 3.3, 4.4, 5.5};

int maxi = max5(a);

double maxd = max5(b);

cout << "max in a[5]: " << maxi << endl << "max in b[5]: " << maxd << endl;

return 0;

}

template <class AnyType>

AnyType max5(AnyType ar[])

{

AnyType max = ar[0];

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

{

if (max < ar[i])

max = ar[i];

}

return max;

}

//ex8.6

#include <iostream>

template <typename T>

T maxn(T ar[], int n);

template <> const char\* maxn(const char\* ar[], int n);

int main()

{

using namespace std;

int ari[6] = {1, 2, 3, 4, 6, 5};

double ard[4] = {1.1, 2.2, 4.4, 3.3};

const char \* ars[5] = {

"a",

"bb",

"ccc",

"ddddd",

"eeee"

};

cout << "The max integer of array is: " << maxn(ari, 6) << endl;

cout << "The max double of array is: " << maxn(ard, 4) << endl;

cout << "The max string of array is: " << maxn(ars, 5)<<endl;

}

template <typename T>

T maxn(T ar[], int n)

{

T maxar = ar[0];

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

{

if (maxar <ar[i])

maxar = ar[i];

}

return maxar;

}

template <> const char\* maxn(const char\* ar[],int n)

{

const char \*maxs =ar[0];

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

{

if (strlen(maxs) <strlen(ar[i]))

maxs = ar[i];

}

return maxs;

}

#include <iostream>

using namespace std;

template <typename T>

T maxn(T [], int);

template <> const char\* maxn<const char \*>(const char \* [], int);

int main()

{

int a[6] = {1, 2, 3, 4, 5, 6};

double b[4] = {1.1, 2.2, 3.3, 4.4};

int maxi = maxn(a, 6);

double maxd = maxn(b, 4);

const char \* c[5] = {

"a",

"bb",

"ccc",

"ddddd",

"eeee"

};

cout << "maxi: " << maxi << endl

<< "maxd: " << maxd << endl

<< "The max string of array is: " << maxn(c, 5) << endl;

return 0;

}

template <typename T>

T maxn(T ar[], int n)

{

T max = ar[0];

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

{

if (max < ar[i])

max = ar[i];

}

return max;

}

template <> const char\* maxn<const char \*>(const char \*ar[],int n)

{

const char \*

maxs =ar[0];

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

{

if (strlen(maxs) <strlen(ar[i]))

maxs = ar[i];

}

return maxs;

}

//ex8.7

#include <iostream>

template <typename T>

T SumArrray(T arr[], int n);

template <typename T>

T SumArrray(T \* arr[], int n);

struct debts

{

char name[50];

double amount;

};

int main()

{

using namespace std;

int things[6] = {13, 31, 103, 301, 310, 130};

struct debts mr\_E[3] = {

{"Ima Wolfe", 2400.0},

{"Ura Foxe", 1300.0},

{"Iby Stout", 1800.0}

};

double \* pd[3];

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

pd[i] = &mr\_E[i].amount;

cout << "Sum: Mr.E's counts of things: "<< SumArrray(things, 6) << endl;

cout << "Sum: Mr.E's debts: "<< SumArrray(pd, 3) << endl;

return 0;

}

template <typename T>

T SumArrray(T arr[], int n)

{

using namespace std;

T sum = 0;

cout << "template A\n";

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

sum += arr[i];

return sum;

}

template <typename T>

T SumArrray(T \* arr[], int n)

{

using namespace std;

T sum = 0;

cout << "template B\n";

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

sum += \*arr[i];

return sum;

}

第9 章内存模型和名称空间**// ex9.1** //golf.h

const int Len = 40;

struct golf

{

char fullname[Len];

int handicap;

};

void setgolf(golf & g, const char \* name, int hc);

int setgolf(golf & g);

void handicap(golf & g, int hc);

void showgolf(const golf & g);

//golf.cpp

#include <iostream>

#include "golf.h"

using namespace std;

int setgolf(golf & g)

{

cout << "Enter the golfer's name: \n";

cin.get(g.fullname, Len);

if (g.fullname[0] == '\0')

return 0;

cout << "Enter the handicap for " << g.fullname << endl;

while (!(cin >> g.handicap))

{

cin.clear();

while (cin.get() != '\n')

continue;

cout << "Please enter an integer.\n";

} cin.get();

return 1;

} void setgolf(golf &

g, const char \*

name, int hc)

{

strncpy\_s(g.fullname, name, Len);

g.handicap = hc;

} void handicap(golf &

g, int hc)

{

g.handicap = hc;

} void showgolf(const golf &

g)

{

cout << "Golfer: " << g.fullname << "\n";

cout << "Handicap: " << g.handicap << "\n\n";

}

//main.cpp

#include <iostream>

#include "golf.h"

const int Men = 5;

int main()

{

golf golfer[Men];

int i;

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

{

if(setgolf(golfer[i]) == 0)

break;

} for (

int j

=

0; j

<

i; j++)

showgolf(golfer[j]);

golf ann;

setgolf(ann, "Ann Birdfree", 24);

showgolf(ann);

handicap(ann, 4);

showgolf(ann);

return 0;

}

**//ex9.2** #include <iostream>

#include <string>

using namespace std;

void strcount(const string);

int main()

{

string input;

cout << "Enter a line:\n";

getline(cin, input);

while (input != "")

{

strcount(input);

cout << "Enter next line (empty line to quit):\n";

getline(cin, input);

}

cout << "Bye\n";

return 0;

} void strcount(const string str)

{

static int total = 0;

int count;

count = str.size();

total += count;

cout << count << " characters\n";

cout << total << " characters total\n";

}

//ex9.3

#include <iostream>

#include <new>

#include <cstring>

using namespace std;

struct chaff

{

char dross[20];

int slag;

};

int main()

{

chaff \* p = new chaff[2];

strcpy\_s(p[0].dross, "Piffa like");

p[0].slag = 5;

strcpy\_s(p[1].dross, "Fuck me so hard");

p[1].slag = 6;

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

cout << p[i].dross << " " << p[i].slag << endl;

return 0;

}

//ex9.4

//sales.h

namespace SALES

{ const int QUARTERS =

4;

struct Sales

{ double sales[QUARTERS];

double average;

double max;

double min;

};

// copies the lesser of 4 or n items from the array ar

// to the sales member of s and computes and stores the

// average, maximum, and minimum values of the entered items;

// remaining elements of sales, if any, set to 0

void setSales(Sales & s, const double ar[], int n);

// gathers sales for 4 quarters interactively, stores them

// in the sales member of s and computes and stores the

// average, maximum, and minimum values

void setSales(Sales & s);

// display all information in structure s

void showSales(const Sales & s);

} //Sales.cpp

#include <iostream>

#include "Sales.h"

namespace SALES

{ using std::cout;

using std::cin;

using std::endl;

static double calaverage(double arr[], unsigned arrSize)

{ double sum =

0;

for (int i=0; i<arrSize; i++)

sum += arr[i];

return sum/arrSize;

} static double calmax(double arr[], unsigned arrSize)

{ double max =

arr[0];

for (int i=1; i<arrSize; i++)

{ if (

max <

arr[i])

max = arr[i];

} return max;

} static double calmin(double arr[], unsigned arrSize)

{ double min =

arr[0];

for (int i=1; i<arrSize; i++)

{ if (

min >

arr[i])

min = arr[i];

} return min;

} void setSales(Sales &

s, const double ar[], int n)

{ unsigned times =

n

<

QUARTERS ?

(

unsigned)n

:

QUARTERS;

for (int i=0; i<times; i++)

s.sales[i] = ar[i];

for (int i=times; i<QUARTERS; i++)

s.sales[i] = 0;

s.average = calaverage(s.sales, times);

s.max = calmax(s.sales, times);

s.min = calmin(s.sales, times);

} void setSales(Sales &

s)

{ cout << "

Enter 4

sales:\n";

for (int i=0; i<QUARTERS; i++)

{ cout << "

sales "

<< i+1

<< ": ";

cin >> s.sales[i];

} s.average =

calaverage(s.sales, QUARTERS);

s.max = calmax(s.sales, QUARTERS);

s.min = calmin(s.sales, QUARTERS);

} void showSales(const Sales &

s)

{ cout << "

sales: ";

for (int i=0; i<QUARTERS; i++)

cout << s.sales[i] << " ";

cout << endl;

cout << "average: " << s.average << endl;

cout << "max: " << s.max << endl;

cout << "min: " << s.min << endl;

}} //main

#include <iostream>

#include "Sales.h"

using namespace std;

int main ()

{

using namespace SALES;

Sales salesBook;

double salesList[] = {12.2, 11.16, 10.61, 16.24, 11.53};

setSales(salesBook, salesList,

sizeof(salesList)/sizeof(salesList[0]));

showSales(salesBook);

Sales salesPen;

setSales(salesPen);

showSales(salesPen);

} #

include <

iostream>

#include "Sale.h"

using namespace std;

int main()

{

using namespace SALES;

Sales A, B;

double h[4] = {1.1, 2.2, 3.3, 4.4};

setSales(A);

showSales(A);

setSales(B);

showSales(B);

return 0;

}

第**10** 章对象和类

**//ex10.1** //bankaccount.h

#ifndef BANKACCOUNT\_H\_

#define BANKACCOUNT\_H\_

#include <string>

class BankAccount

{ private:

std::string name;

std::string acctnum;

double balance;

public:

BankAccount(const std::string & client,

const std::string & num, double bal=0.0);

void show() const;

void deposit(double cash);

void withdraw(double cash);

};

#endif

//bankaccount.cpp

#include <iostream>

#include "bankaccount.h"

BankAccount::BankAccount(const std::string & client,

const std::string & num, double bal)

{ name =

client;

acctnum = num;

balance = bal;

} void BankAccount::show()const

{ using std::cout;

using std::endl;

cout << "Client: " << name << endl;

cout << "Account Number: " << acctnum << endl;

cout << "Balance: " << balance << endl;

} void BankAccount::deposit(double cash)

{ if (

cash >= 0)

balance += cash;

else

std::cout << "Illegal transaction attempted";

} void BankAccount::withdraw(double cash)

{ if (

cash <

0)

std::cout << "Illegal transaction attempted";

else if (cash <= balance)

balance -=cash;

else

std::cout << "Request denied due to insufficient funds.\n";

} //main.cpp

#include <iostream>

#include "bankaccount.h"

int main()

{ BankAccount ba("Kermit", "

croak322", 123.00);

ba.show();

ba.deposit(20);

ba.show();

ba.withdraw(300);

ba.show();

ba.withdraw(23);

ba.show();

return 0;

} //ex10.2

#ifndef PERSON\_H\_

#define PERSON\_H\_

#include <string>

class Person

{ private:

static const int LIMIT=25;

std::string lname;

char fname[LIMIT];

public:

Person() {lname=""; fname[0]='\0';} //#1

Person(const std::string &ln, const char \* fn="Heyyou"); //#2

// the following methods display lname and fname

void Show() const; // firstname lastname format

void FormalShow() const; // lastname, firstname format

};

#endif

//person.cpp

#include <iostream>

#include <cstring>

#include "person.h"

Person::Person(const std::string &ln, const char \* fn)

{ lname =

ln;

strcpy(fname, fn);

} void Person::Show() const

{ using std::cout;

using std::endl;

cout << "The people's name is " << fname << " "<< lname << endl;

}

void Person::FormalShow() const

{ using std::cout;

using std::endl;

cout << "The people's name is " << lname << ", "<< fname <<endl;

} //main.cpp

#include <iostream>

#include "person.h"

int main()

{ using std::cout;

using std::endl;

Person one;

Person two("Smythecraft");

Person three("Dimwiddy", "Sam");

one.Show();

one.FormalShow();

cout << endl;

two.Show();

two.FormalShow();

cout << endl;

three.Show();

three.FormalShow();

cout << endl;

return 0;

} //ex10.3

//golf.h

#ifndef GOLF\_H\_

#define GOLF\_H\_

class Golf

{ private:

static const int Len = 40;

char fullname[Len];

int handicap;

public:

Golf();

Golf(const char \* name, int hc);

const Golf & setgolf(const Golf & g);

void showgolf() const;

};

#endif

//golf.cpp

#include <iostream>

#include <cstring>

#include "golf.h"

Golf::Golf()

{ strcpy(fullname, "

No Name");

handicap = 0;

} Golf::Golf(const char \*

name, int hc)

{ strcpy(fullname, name);

handicap = hc;

} const Golf &

Golf::setgolf(const Golf &

g)

{ strcpy(fullname, g.fullname);

handicap = g.handicap;

return \*this;

} void Golf::showgolf() const

{ std::cout << "

Golfer: "

<< fullname << "\n";

std::cout << "Handicap: " << handicap << "\n\n";

} //main

#include <iostream>

#include "golf.h"

int main()

{ Golf golger1("Ann Birdfree", 5);

golger1.showgolf();

Golf golger2;

golger2.setgolf(golger1);

golger2.showgolf();

return 0;

} //ex10.4

//sale.h

#ifndef SALE\_H\_

#define SALE\_H\_

namespace SALES

{ const int QUARTERS =

4;

class Sales

{ private:

double sales[QUARTERS];

double average;

double max;

double min;

public:

// default constructor

Sales();

// copies the lesser of 4 or n items from the array ar

// to the sales member of s and computes and stores the

// average, maximum, and minimum values of the entered items;

// remaining elements of sales, if any, set to 0

Sales(const double ar[], int n);

// gathers sales for 4 quarters interactively, stores them

// in the sales member of s and computes and stores the

// average, maximum, and minimum values

void setSales();

// display all information in structure s

void showSales() const;

};

} #

endif

//sale.cpp

#include <iostream>

#include "sale.h"

namespace SALES

{ using std::cout;

using std::cin;

using std::endl;

static double calaverage(double arr[], unsigned arrSize)

{ double sum =

0;

for (int i=0; i<arrSize; i++)

sum += arr[i];

return sum/arrSize;

} static double calmax(double arr[], unsigned arrSize)

{ double max =

arr[0];

for (int i=1; i<arrSize; i++)

{

if (max < arr[i])

max = arr[i];

} return max;

} static double calmin(double arr[], unsigned arrSize)

{ double min =

arr[0];

for (int i=1; i<arrSize; i++)

{ if (

min >

arr[i])

min = arr[i];

} return min;

} Sales::Sales()

{ min =

0;

max = 0;

average = 0;

for (int i = 0; i < QUARTERS; i++)

sales[i] =0;

} Sales::Sales(const double ar[], int n)

{ unsigned times =

n

<

QUARTERS ?

(

unsigned)n

:

QUARTERS;

for (int i=0; i<times; i++)

sales[i] = ar[i];

for (int i=times; i<QUARTERS; i++)

sales[i] = 0;

average = calaverage(sales, times);

max = calmax(sales, times);

min = calmin(sales, times);

} void Sales::setSales()

{ cout << "

Enter 4

sales:\n";

for (int i=0; i<QUARTERS; i++)

{ cout << "

sales "

<< i+1

<< ": ";

cin >> sales[i];

} \*

this = Sales(sales, QUARTERS);

}

void Sales::showSales() const

{ cout << "

sales: ";

for (int i=0; i<QUARTERS; i++)

cout << sales[i] << " ";

cout << endl;

cout << "average: " << average << endl;

cout << "max: " << max << endl;

cout << "min: " << min << endl;

}} //main.cpp

#include <iostream>

#include "sale.h"

using namespace std;

int main ()

{ using namespace SALES;

double salesList[] = {12.2, 11.16, 10.61, 16.24, 11.53};

Sales salesBook(salesList,

sizeof(salesList)/sizeof(salesList[0]));

salesBook.showSales();

Sales salesPen;

salesPen.setSales();

salesPen.showSales();

return 0;

} //ex10.5

//stack.h

#ifndef STACK\_H\_

#define STACK\_H\_

struct customer{

char fullname[35];

double payment;

};

typedef customer Item;

class Stack

{ private:

enum {MAX = 10};

Item items[MAX];

int top;

public:

Stack();

bool isempty() const;

bool isfull() const;

// push() returns false if stack already is full, true otherwise

bool push(const Item & item); // add item to stack

// pop() returns false if stack already is empty, true otherwise

bool pop(Item & item); // pop top into item

};

#endif

//stack.cpp

#include <iostream>

#include "stack.h"

Stack::Stack()

{ top =

0;

} bool Stack::isempty() const

{ return top == 0;

} bool Stack::isfull() const

{ return top == MAX;

} bool Stack::push(const Item &

item)

{ if (

top <

MAX)

{ items[top++] =

item;

return true;

} else

return false;

} bool Stack::pop(Item &

item)

{ if (

top >

0)

{ item =

items[--top];

return true;

} else

return false;

} //main.cpp

#include <iostream>

#include <cctype>

#include "stack.h"

void get\_customer(customer & cu);

int main()

{ using namespace std;

Stack st;

customer temp;

double payment = 0;

char ch;

cout << "Please enter A to add a customer,\n"

<< "P to process a customer, and Q to quit.\n";

while (cin >> ch && (ch = toupper(ch)) != 'Q')

{ while (

cin.get() != '\n')

continue;

if (ch != 'A' && ch != 'P')

{ cout << "

Please respond A, P

or Q: ";

continue;

} switch (

ch)

{ case '

A':if (

st.isfull())

cout << "stack already full\n";

else

{ get\_customer(temp);

st.push(temp);

} break;

case 'P':if (st.isempty())

cout << "stack is empty\n";

else

{ st.pop(temp);

payment += temp.payment;

cout << temp.fullname << " processed. ";

cout << "Payments now total $"

<< payment << "\n";

} break;

}

cout << "Please enter A to add a customer,\n"

<< "P to process a customer, and Q to quit.\n";

} cout << "

Done!\n";

return 0;

} void get\_customer(customer &

cu)

{ using namespace std;

cout << "Enter customer name: ";

cin.getline(cu.fullname, 35);

cout << "Enter customer payment: ";

cin >> cu.payment;

while (cin.get() != '\n')

continue;

} //ex10.6

//move.h

#ifndef MOVE\_H\_

#define MOVE\_H\_

class Move

{ private:

double x;

double y;

public:

Move(double a = 0, double b = 0);

void showMove() const;

Move add(const Move & m) const;

//this function adds x of m to x of invoking object to get new x

//add y of m to y of invoking object to get new y, creates a new

//move object initialized to new x,y values and returns it

void reset(double a = 0,double b = 0);

};

#endif

//move.cpp

#include <iostream>

#include "move.h"

Move::Move(double a, double b)

{x

= a;

y = b;

} void Move::showMove() const

{ std::cout << "

x

=

"

<< x

<< ", y = " << y << "\n";

} Move Move::add(const Move &

m) const

{ Move temp;

temp.x = x + m.x;

temp.y = y + m.y;

return temp;

} void Move::reset(double a, double b)

{x

= a;

y = b;

} //main

#include <iostream>

#include "move.h"

int main()

{ using std::cout;

using std::endl;

Move move1(4,5);

Move move2(2,1);

Move move3;

cout << "The number in move1 is:\n";

move1.showMove();

cout << "The number in move2 is:\n";

move2.showMove();

move3 = move2.add(move1);

cout << "The number in move3 is :\n";

move3.showMove();

cout << "move1+move2, now move2's number is :\n";

move2.showMove();

cout << "After move1 + move2,now move1's number is :\n";

move1.showMove();

move1.reset();

cout << "After reset move1,now move1's number is:\n";

move1.showMove();

return 0;

} //ex10.7

//plorg.cpp

#ifndef PLORG\_H\_

#define PLORG\_H\_

class Plorg

{ private:

char name[20];

int CI;

public:

Plorg();

Plorg(char \* na, int n = 50);

void resetCI(int n);

void showplorg() const;

};

#endif

//plorg.cpp

#include <iostream>

#include <cstring>

#include "plorg.h"

Plorg::Plorg()

{ strcpy(name, "

Plorga");

CI = 0;

} Plorg::Plorg(char \*

na, int n)

{ strcpy(name, na);

CI = n;

} void Plorg::resetCI(int n)

{ CI =

n;

} void Plorg::showplorg() const

{ std::cout << "

The plorg's name is "

<< name << "\n"

<<"The CI is "<< CI <<std::endl;

} //main.cpp

#include <iostream>

#include "plorg.h"

int main()

{ using namespace std;

Plorg plorg1;

plorg1.showplorg();

Plorg plorg2("heyyroup", 31);

plorg2.showplorg();

plorg1.resetCI(41);

plorg1.showplorg();

return 0;

} //ex10.8

//list.h

#ifndef LIST\_H\_

#define LIST\_H\_

const int TSIZE = 50;

struct film

{ char title[TSIZE];

int rating;

};

typedef struct film Item;

const int LISTMAX = 10;

class List

{ private:

Item items[LISTMAX];

int count;

public:

List();

bool isempty();

bool isfull();

int itemcount();

bool additem(Item item);

void visit(void (\*pf)(Item &));

};

#endif

//list.cpp

#include "list.h"

List::List()

{ count =

0;

} bool List::isempty()

{ return count == 0;

} bool List::isfull()

{ return count == LISTMAX;

} int List::itemcount()

{ return count;

} bool List::additem(Item item)

{ if (

count == LISTMAX)

return false;

else

items[count++] = item;

return true;

} void List::visit(void (\*pf)(Item &))

{ for (

int i=0; i<count; i++)

(\*pf)(items[i]);

} //main.cpp

#include <iostream>

#include <cstdlib>

#include "list.h"

void showfilm(Item & item);

int main()

{ using namespace std;

List movies;

Item temp;

if (movies.isfull())

{ cout << "

No more room in list! Bye!\n";

exit(1);

} cout << "

Enter first movie title:\n";

while (cin.getline(temp.title, TSIZE) && temp.title[0] != '\0')

{ cout << "

Enter your rating <

1-10>: ";

cin >> temp.rating;

while (cin.get() != '\n')

continue;

if (movies.additem(temp) == false)

{

cout << "List already is full!\n";

break;

} if (

movies.isfull())

{ cout << "

You have filled the list.\n";

break;

} cout << "

Enter next movie title (

empty line to stop):\n";

} if (

movies.isempty())

cout << "No data entered.";

else

{ cout << "

Here is the movie list:\n";

movies.visit(showfilm);

} cout << "

Bye!\n";

return 0;

} void showfilm(Item &

item)

{ std::cout << "

Movie: "

<< item.title << "

Rating: "

<< item.rating << std::endl;

} //11

1、

//vector.h

#ifndef VECTOR\_H\_

#define VECTOR\_H\_

#include <iostream>

#include <cmath>

#include <cstdlib>

#include <ctime>

#include <fstream>

using namespace std;

namespace VECTOR

{

class Vector

{

public:

enum Mode { RECT, POL };

private:

double x;

double y;

double mag;

doubleang;

Mode mode;

voidset\_mag();

voidset\_ang();

voidset\_x();

voidset\_y();

public:

Vector();

Vector(double n1, double n2, Mode form = RECT);

void reset(double n1, double n2, Mode form = RECT);

~Vector();

doublexval()const{ return x; }

doubleyval()const{ return y; }

doublemagval()const { return mag; }

doubleangval()const { return ang; }

voidpolar\_mode();

voidrect\_mode();

Vector operator+(const Vector &b)const;

Vector operator-(const Vector &b)const;

Vector operator-()const;

Vector operator\*(double n)const;

friend Vector operator\*(double n, const Vector &a);

friendostream& operator<<(ostream&os, const Vector &v);

};

}

#endif

//vector.cpp

#include "vector.h"

namespace VECTOR

{

const double Rad\_to\_deg = 45.0 / atan(1.0);

void Vector::set\_mag()

{

mag = sqrt(x \* x + y \* y);

}

void Vector::set\_ang()

{

if (x == 0.0 && y == 0.0)

ang = 0.0;

else

ang = atan2(y, x);

}

void Vector::set\_x()

{

x = mag \* cos(ang);

}

void Vector::set\_y()

{

y = mag \* sin(ang);

}

Vector::Vector()

{

x = y = mag = ang = 0.0;

mode = RECT;

}

Vector::Vector(double n1, double n2, Mode form)

{

mode = form;

if (form == RECT)

{

x = n1;

y = n2;

set\_mag();

set\_ang();

}

else if (form == POL)

{

mag = n1;

ang = n2 / Rad\_to\_deg;

set\_x();

set\_y();

}

else

{

cout<< "Incorrect 3rd argument to Vector() -- ";

cout<< "vector set to 0\n";

x = y = mag = ang = 0.0;

mode = RECT;

}

}

void Vector::reset(double n1, double n2, Mode form)

{

mode = form;

if (form == RECT)

{

x = n1;

y = n2;

set\_mag();

set\_ang();

}

else if (form == POL)

{

mag = n1;

ang = n2 / Rad\_to\_deg;

set\_x();

set\_y();

}

else

{

cout<< "Incorrect 3rd argument to Vector() -- ";

cout<< "vector set to 0\n";

x = y = mag = ang = 0.0;

mode = RECT;

}

}

Vector::~Vector()

{

}

void Vector::polar\_mode()

{

mode = POL;

}

void Vector::rect\_mode()

{

mode = RECT;

}

Vector Vector::operator+(const Vector &b)const

{

return Vector(x + b.x, y + b.y);

}

Vector Vector::operator-(const Vector &b)const

{

return Vector(x - b.x, y - b.y);

}

Vector Vector::operator-()const

{

return Vector(-x, -y);

}

Vector Vector::operator\*(double n)const

{

return Vector(n\*x, n\*y);

}

Vector operator\*(double n, const Vector &a)

{

return a\*n;

}

ostream&operator<<(ostream&os, const Vector &v)

{

if (v.mode == Vector::RECT)

os<< "(x,y) = (" <<v.x<< ", " <<v.y<< ")";

else if (v.mode == Vector::POL)

{

os<< "(m,a) = (" <<v.mag<< ", "

<<v.ang\*Rad\_to\_deg<< ")";

}

else

os<< "Vector object mode is invalid";

returnos;

}

}

//randwalk.cpp

#include "vector.h"

int main()

{

using VECTOR::Vector;

srand(time(0));

double direction;

Vector step;

Vector result(0.0, 0.0);

unsigned long steps = 0;

double target;

doubledstep;

ofstreamfout;

fout.open("savesteps.txt");

cout<< "Enter target distance (q to quit): ";

while (cin>> target)

{

cout<< "Enter step length: ";

if (!(cin>>dstep))

break;

fout<< "Target Distance: " << target << " Step Size: " <<dstep<<endl;

while (result.magval() < target)

{

fout<< steps << ": " << result <<endl;

direction = rand() % 360;

step.reset(dstep, direction, Vector::POL);

result = result + step;

steps++;

}

cout<< "After " << steps << " steps, the subject "

"has the following location:\n";

cout<< result <<endl;

fout<< "After " << steps << " steps, the subject "

"has the following location:\n";

fout<< result <<endl;

result.polar\_mode();

cout<< " or\n" << result <<endl;

cout<< "Average outward distance per step = "

<<result.magval() / steps <<endl;

fout<< " or\n" << result <<endl;

fout<< "Average outward distance per step = "

<<result.magval() / steps <<endl;

steps = 0;

result.reset(0.0, 0.0);

cout<< "Enter target distance (q to quit): ";

}

cout<< "Bye!\n";

cin.clear();

while (cin.get() != '\n')

continue;

cin.get();

return 0;

}

2、

//vector.h

#ifndef VECTOR\_H\_

#define VECTOR\_H\_

#include <iostream>

#include <cmath>

#include <cstdlib>

#include <ctime>

using namespace std;

namespace VECTOR

{

class Vector

{

public:

enum Mode { RECT, POL };

private:

double x;

double y;

Mode mode;

doubleset\_mag()const;

doubleset\_ang()const;

voidset\_x(double mag, double ang);

voidset\_y(double mag, double ang);

public:

Vector();

Vector(double n1, double n2, Mode form = RECT);

void reset(double n1, double n2, Mode form = RECT);

~Vector();

doublexval()const{ return x; }

doubleyval()const{ return y; }

doublemagval()const { return set\_mag(); }

doubleangval()const { return set\_ang(); }

voidpolar\_mode();

voidrect\_mode();

Vector operator+(const Vector &b)const;

Vector operator-(const Vector &b)const;

Vector operator-()const;

Vector operator\*(double n)const;

friend Vector operator\*(double n, const Vector &a);

friendostream& operator<<(ostream&os, const Vector &v);

};

}

#endif

//vector.cpp

#include "vector.h"

namespace VECTOR

{

const double Rad\_to\_deg = 45.0 / atan(1.0);

double Vector::set\_mag()const

{

returnsqrt(x \* x + y \* y);

}

double Vector::set\_ang()const

{

if (x == 0.0 && y == 0.0)

return 0.0;

else

return atan2(y, x);

}

void Vector::set\_x(double mag, double ang)

{

x = mag \* cos(ang);

}

void Vector::set\_y(double mag, double ang)

{

y = mag \* sin(ang);

}

Vector::Vector()

{

x = y = 0.0;

mode = RECT;

}

Vector::Vector(double n1, double n2, Mode form)

{

mode = form;

if (form == RECT)

{

x = n1;

y = n2;

}

else if (form == POL)

{

set\_x(n1, n2 / Rad\_to\_deg);

set\_y(n1, n2 / Rad\_to\_deg);

}

else

{

cout<< "Incorrect 3rd argument to Vector() -- ";

cout<< "vector set to 0\n";

x = y = 0.0;

mode = RECT;

}

}

void Vector::reset(double n1, double n2, Mode form)

{

mode = form;

if (form == RECT)

{

x = n1;

y = n2;

}

else if (form == POL)

{

set\_x(n1, n2 / Rad\_to\_deg);

set\_y(n1, n2 / Rad\_to\_deg);

}

else

{

cout<< "Incorrect 3rd argument to Vector() -- ";

cout<< "vector set to 0\n";

x = y = 0.0;

mode = RECT;

}

}

Vector::~Vector()

{

}

void Vector::polar\_mode()

{

mode = POL;

}

void Vector::rect\_mode()

{

mode = RECT;

}

Vector Vector::operator+(const Vector &b)const

{

return Vector(x + b.x, y + b.y);

}

Vector Vector::operator-(const Vector &b)const

{

return Vector(x - b.x, y - b.y);

}

Vector Vector::operator-()const

{

return Vector(-x, -y);

}

Vector Vector::operator\*(double n)const

{

return Vector(n\*x, n\*y);

}

Vector operator\*(double n, const Vector &a)

{

return a\*n;

}

ostream&operator<<(ostream&os, const Vector &v)

{

if (v.mode == Vector::RECT)

os<< "(x,y) = (" <<v.x<< ", " <<v.y<< ")";

else if (v.mode == Vector::POL)

{

os<< "(m,a) = (" <<v.set\_mag() << ", "

<<v.set\_ang()\*Rad\_to\_deg<< ")";

}

else

os<< "Vector object mode is invalid";

returnos;

}

}

//randwalk.cpp

#include "vector.h"

int main()

{

using VECTOR::Vector;

srand(time(0));

double direction;

Vector step;

Vector result(0.0, 0.0);

unsigned long steps = 0;

double target;

doubledstep;

cout<< "Enter target distance (q to quit): ";

while (cin>> target)

{

cout<< "Enter step length: ";

if (!(cin>>dstep))

break;

while (result.magval() < target)

{

direction = rand() % 360;

step.reset(dstep, direction, Vector::POL);

result = result + step;

steps++;

}

cout<< "After " << steps << " steps, the subject "

"has the following location:\n";

cout<< result <<endl;

result.polar\_mode();

cout<< " or\n" << result <<endl;

cout<< "Average outward distance per step = "

<<result.magval() / steps <<endl;

steps = 0;

result.reset(0.0, 0.0);

cout<< "Enter target distance (q to quit): ";

}

cout<< "Bye!\n";

cin.clear();

while (cin.get() != '\n')

continue;

cin.get();

return 0;

}

3、

//vector.h

#ifndef VECTOR\_H\_

#define VECTOR\_H\_

#include <iostream>

#include <cmath>

#include <cstdlib>

#include <ctime>

using namespace std;

namespace VECTOR

{

class Vector

{

public:

enum Mode { RECT, POL };

private:

double x;

double y;

double mag;

doubleang;

Mode mode;

voidset\_mag();

voidset\_ang();

voidset\_x();

voidset\_y();

public:

Vector();

Vector(double n1, double n2, Mode form = RECT);

void reset(double n1, double n2, Mode form = RECT);

~Vector();

doublexval()const{ return x; }

doubleyval()const{ return y; }

doublemagval()const { return mag; }

doubleangval()const { return ang; }

voidpolar\_mode();

voidrect\_mode();

Vector operator+(const Vector &b)const;

Vector operator-(const Vector &b)const;

Vector operator-()const;

Vector operator\*(double n)const;

friend Vector operator\*(double n, const Vector &a);

friendostream& operator<<(ostream&os, const Vector &v);

};

}

#endif

//vector.cpp

#include "vector.h"

namespace VECTOR

{

const double Rad\_to\_deg = 45.0 / atan(1.0);

void Vector::set\_mag()

{

mag = sqrt(x \* x + y \* y);

}

void Vector::set\_ang()

{

if (x == 0.0 && y == 0.0)

ang = 0.0;

else

ang = atan2(y, x);

}

void Vector::set\_x()

{

x = mag \* cos(ang);

}

void Vector::set\_y()

{

y = mag \* sin(ang);

}

Vector::Vector()

{

x = y = mag = ang = 0.0;

mode = RECT;

}

Vector::Vector(double n1, double n2, Mode form)

{

mode = form;

if (form == RECT)

{

x = n1;

y = n2;

set\_mag();

set\_ang();

}

else if (form == POL)

{

mag = n1;

ang = n2 / Rad\_to\_deg;

set\_x();

set\_y();

}

else

{

cout<< "Incorrect 3rd argument to Vector() -- ";

cout<< "vector set to 0\n";

x = y = mag = ang = 0.0;

mode = RECT;

}

}

void Vector::reset(double n1, double n2, Mode form)

{

mode = form;

if (form == RECT)

{

x = n1;

y = n2;

set\_mag();

set\_ang();

}

else if (form == POL)

{

mag = n1;

ang = n2 / Rad\_to\_deg;

set\_x();

set\_y();

}

else

{

cout<< "Incorrect 3rd argument to Vector() -- ";

cout<< "vector set to 0\n";

x = y = mag = ang = 0.0;

mode = RECT;

}

}

Vector::~Vector()

{

}

void Vector::polar\_mode()

{

mode = POL;

}

void Vector::rect\_mode()

{

mode = RECT;

}

Vector Vector::operator+(const Vector &b)const

{

return Vector(x + b.x, y + b.y);

}

Vector Vector::operator-(const Vector &b)const

{

return Vector(x - b.x, y - b.y);

}

Vector Vector::operator-()const

{

return Vector(-x, -y);

}

Vector Vector::operator\*(double n)const

{

return Vector(n\*x, n\*y);

}

Vector operator\*(double n, const Vector &a)

{

return a\*n;

}

ostream&operator<<(ostream&os, const Vector &v)

{

if (v.mode == Vector::RECT)

os<< "(x,y) = (" <<v.x<< ", " <<v.y<< ")";

else if (v.mode == Vector::POL)

{

os<< "(m,a) = (" <<v.mag<< ", "

<<v.ang\*Rad\_to\_deg<< ")";

}

else

os<< "Vector object mode is invalid";

returnos;

}

}

//randwalk.cpp

#include "vector.h"

int main()

{

using VECTOR::Vector;

srand(time(0));

double direction;

Vector step;

Vector result(0.0, 0.0);

unsigned long steps = 0;

double target;

doubledstep;

doublenumbers,N;

double Min, Max, Sum, Average;

cout<< "Enter target distance: ";

cin>> target;

cout<< "Enter step length: ";

cin>>dstep;

cout<< "Enter test numbers: ";

cin>> numbers;

N = numbers;

Min = Max = Sum = Average = 0.0;

while (numbers)

{

while (result.magval() < target)

{

direction = rand() % 360;

step.reset(dstep, direction, Vector::POL);

result = result + step;

steps++;

}

cout<< "After " << steps << " steps once a walk\n";

if (Min == 0 || Max == 0)

Min = Max = steps;

if (Min > steps)

Min = steps;

if (Max < steps)

Max = steps;

Sum += steps;

numbers--;

steps = 0;

result.reset(0.0, 0.0);

}

Average = Sum / N;

cout<< "Max steps is " << Max <<endl;

cout<< "Min steps is " << Min <<endl;

cout<< "Average steps is " << Average <<endl;

cout<< "Bye!\n";

cin.clear();

while (cin.get() != '\n')

continue;

cin.get();

return 0;

}

4、

//mytime.h

#ifndef MYTIME\_H\_

#define MYTIME\_H\_

#include <iostream>

#include <string>

#include <stdio.h>

using namespace std;

class Time

{

private:

int hours;

int minutes;

public:

Time();

Time(int h, int m = 0);

voidAddMin(int m);

voidAddHr(int h);

void Reset(int h = 0, int m = 0);

Time operator\*(double n)const;

friend Time operator-(const Time &t1, const Time &t2);

friend Time operator+(const Time &t1, const Time &t2);

friend Time operator\*(double m, const Time &t)

{

return t \* m;

}

friendostream& operator<<(ostream&os, const Time &t);

};

#endif

//mytime.cpp

#include "mytime.h"

Time::Time()

{

hours = minutes = 0;

}

Time::Time(int h, int m)

{

hours = h;

minutes = m;

}

void Time::AddMin(int m)

{

minutes += m;

hours += minutes / 60;

minutes %= 60;

}

void Time::AddHr(int h)

{

hours += h;

}

void Time::Reset(int h, int m)

{

hours = h;

minutes = m;

}

Time operator+(const Time &t1, const Time &t2)

{

Time sum;

sum.minutes = t1.minutes + t2.minutes;

sum.hours = t1.hours + t2.hours + sum.minutes / 60;

sum.minutes %= 60;

return sum;

}

Time operator-(const Time &t1, const Time &t2)

{

Time diff;

int tot1, tot2;

tot1 = t1.minutes + 60 \* t1.hours;

tot2 = t2.minutes + 60 \* t2.hours;

diff.minutes = (tot1 - tot2) % 60;

diff.hours = (tot1 - tot2) / 60;

return diff;

}

Time Time::operator\*(double mult)const

{

Time result;

longtotalminutes = hours \* mult \* 60 + minutes \* mult;

result.hours = totalminutes / 60;

result.minutes = totalminutes % 60;

return result;

}

ostream&operator<<(ostream&os, const Time &t)

{

os<<t.hours<< " hours, " <<t.minutes<< " minutes";

returnos;

}

//usetime.cpp

#include "mytime.h"

int main()

{

Time aida(3, 35);

Time tosca(2, 48);

Time temp;

cout<< "Aida and Tosca:\n";

cout<<aida<< "; " <<tosca<<endl;

temp = aida + tosca;

cout<< "Aida + Tosca: " << temp <<endl;

temp = aida - tosca;

cout<< "Aida - Tosca: " << temp <<endl;

temp = aida \* 1.17;

cout<< "Aida \* 1.17: " << temp <<endl;

cout<< "10.0 \* Tosca: " << 10.0 \* tosca<<endl;

cin.get();

return 0;

}

5、

//stonewt.h

#ifndef STONEWT\_H\_

#define STONEWT\_H\_

#include <iostream>

#include <stdio.h>

#include <string>

using namespace std;

classStonewt

{

public:

enum Mode { STN, INPD, FPD };

private:

staticintconstLbs\_per\_stn = 14;

int stone;

doublepds\_left;

double pounds;

intpounds\_int;

Mode mode;

voidset\_stn();

voidset\_pds();

voidset\_pds\_int();

public:

Stonewt(double lbs, Mode form);

Stonewt(intstn, double lbs, Mode form);

Stonewt();

~Stonewt();

voidstn\_mode();

voidpds\_mode();

voidint\_pds\_mode();

operatorint()const;

operator double()const;

Stonewt operator+(constStonewt&st)const;

Stonewt operator-(constStonewt&st)const;

Stonewt operator\*(double n)const;

friendStonewt operator\*(double n, constStonewt&st);

friendostream&operator<<(ostream&os, constStonewt&st);

};

#endif

//stonewt.cpp

#include "stonewt.h"

voidStonewt::set\_stn()

{

stone = int(pounds) / Lbs\_per\_stn;

pds\_left = int(pounds) % Lbs\_per\_stn + pounds - int(pounds);

}

voidStonewt::set\_pds()

{

pounds = stone\*Lbs\_per\_stn + pds\_left;

}

voidStonewt::set\_pds\_int()

{

pounds\_int = int(pounds);

}

Stonewt::Stonewt(double lbs, Mode form)

{

mode = form;

if (form == STN)

{

stone = int(lbs) / Lbs\_per\_stn;

pds\_left = int(lbs) % Lbs\_per\_stn + lbs - int(lbs);

set\_pds();

set\_pds\_int();

}

else if (form == INPD)

{

pounds\_int = int(lbs);

pounds = lbs;

set\_stn();

}

else if (form == FPD)

{

pounds = lbs;

set\_pds\_int();

set\_stn();

}

else

{

cout<< "Incorrect 3rd argument to Stonewt() -- ";

cout<< "Stonewt set to 0\n";

stone = pounds = pds\_left = 0;

mode = STN;

}

}

Stonewt::Stonewt(intstn, double lbs, Mode form)

{

mode = form;

if (form == STN)

{

stone = stn;

pds\_left = lbs;

set\_pds();

set\_pds\_int();

}

else if (form == INPD)

{

pounds\_int = int(stn\*Lbs\_per\_stn + lbs);

pounds = stn\*Lbs\_per\_stn + lbs;

set\_stn();

}

else if (form == FPD)

{

pounds = stn\*Lbs\_per\_stn + lbs;

set\_pds\_int();

set\_stn();

}

else

{

cout<< "Incorrect 3rd argument to Stonewt() -- ";

cout<< "Stonewt set to 0\n";

stone = pounds = pds\_left = 0;

mode = STN;

}

}

Stonewt::Stonewt()

{

stone = pounds = pds\_left = 0;

mode = STN;

}

Stonewt::~Stonewt()

{

}

voidStonewt::stn\_mode()

{

mode = STN;

}

voidStonewt::pds\_mode()

{

mode = FPD;

}

voidStonewt::int\_pds\_mode()

{

mode = INPD;

}

Stonewt::operator int()const

{

returnint(pounds + 0.5);

}

Stonewt::operator double()const

{

return pounds;

}

StonewtStonewt::operator+(constStonewt&st)const

{

returnStonewt(pounds + st.pounds, st.mode);

}

StonewtStonewt::operator-(constStonewt&st)const

{

returnStonewt(pounds - st.pounds, st.mode);

}

StonewtStonewt::operator\*(double n)const

{

returnStonewt(pounds\*n, mode);

}

Stonewt operator\*(double n, constStonewt&st)

{

returnStonewt(n\*st.pounds, st.mode);

}

ostream&operator<<(ostream&os, constStonewt&st)

{

if (st.mode == Stonewt::STN)

os<<st.stone<< " stone, " <<st.pds\_left<< " pounds\n";

else if (st.mode == Stonewt::INPD)

os<<st.pounds\_int<< " pounds(int)\n";

else if (st.mode == Stonewt::FPD)

os<<st.pounds<< " pounds(double)\n";

else

os<< "Error in type\n";

returnos;

}

//stone.cpp

#include "stonewt.h"

int main()

{

Stonewt incognito(275,Stonewt::FPD);

Stonewtwolfe(285.7,Stonewt::STN);

Stonewttaft(21, 8,Stonewt::INPD);

Stonewt temp;

cout<< "The celebrity weighed ";

cout<< incognito <<endl;

cout<< "The detective weighed ";

cout<<wolfe<<endl;

cout<< "The President weighed ";

cout<<taft<<endl;

temp = incognito + wolfe;

cout<< "Incognito + Wolfe = " << temp <<endl;

temp = wolfe - incognito;

cout<< "Wolfe - Incognito = " << temp <<endl;

temp = taft \* 10.0;

cout<< "Taft \* 10.0 = " << temp <<endl;

temp = 10.0 \* taft;

cout<< "10.0 \* Taft = " << temp <<endl;

cin.get();

return 0;

}

6、

//stonewt.h

#ifndef STONEWT\_H\_

#define STONEWT\_H\_

#include <iostream>

#include <stdio.h>

#include <string>

using namespace std;

classStonewt

{

private:

enum { Lbs\_per\_stn = 14 };

int stone;

doublepds\_left;

double pounds;

public:

Stonewt(double lbs);

Stonewt(intstn, double lbs);

Stonewt();

~Stonewt();

bool operator<(constStonewt&st)const;

bool operator<=(constStonewt&st)const;

bool operator>(constStonewt&st)const;

bool operator>=(constStonewt&st)const;

bool operator==(constStonewt&st)const;

bool operator!=(constStonewt&st)const;

friendostream&operator<<(ostream&os, constStonewt&st);

};

#endif

//stonewt.cpp

#include "stonewt.h"

Stonewt::Stonewt(double lbs)

{

stone = int(lbs) / Lbs\_per\_stn;

pds\_left = int(lbs) % Lbs\_per\_stn + lbs - int(lbs);

pounds = lbs;

}

Stonewt::Stonewt(intstn, double lbs)

{

stone = stn;

pds\_left = lbs;

pounds = stn \* Lbs\_per\_stn + lbs;

}

Stonewt::Stonewt()

{

stone = pounds = pds\_left = 0;

}

Stonewt::~Stonewt()

{

}

boolStonewt::operator<(constStonewt&st)const

{

if (pounds <st.pounds)

return true;

else

return false;

}

boolStonewt::operator<=(constStonewt&st)const

{

if (pounds <= st.pounds)

return true;

else

return false;

}

boolStonewt::operator>(constStonewt&st)const

{

if (pounds >st.pounds)

return true;

else

return false;

}

boolStonewt::operator>=(constStonewt&st)const

{

if (pounds >= st.pounds)

return true;

else

return false;

}

boolStonewt::operator==(constStonewt&st)const

{

if (pounds == st.pounds)

return true;

else

return false;

}

boolStonewt::operator!=(constStonewt&st)const

{

if (pounds != st.pounds)

return true;

else

return false;

}

ostream&operator<<(ostream&os, constStonewt&st)

{

os<<st.pounds<< " pounds\n";

returnos;

}

//stone.cpp

#include "stonewt.h"

int main()

{

Stonewt sw[6] = { 10.0, 11.0, 12.5 };

Stonewttemp(11.0);

for (inti = 3; i< 6; i++)

{

double input;

cout<< "Enter #" <<i + 1 << ": ";

cin>> input;

sw[i] = input;

}

for (inti = 0; i< 6; i++)

cout<< "#" <<i<< ": " <<sw[i];

int count = 0;

Stonewt Min = sw[0];

Stonewt Max = sw[0];

for (inti = 0; i< 6; i++)

{

if (Min >sw[i])

Min = sw[i];

if (Max <sw[i])

Max = sw[i];

if (temp >= sw[i])

count++;

}

cout<< "The Min pounds: " << Min;

cout<< "The Max pounds: " << Max;

cout<< "The numbers not under 11 pounds: " << count;

cin.get();

cin.get();

return 0;

}

7、

//complexh.h

#ifndef COMPLEX\_H\_

#define COMPLEX\_H\_

#include <iostream>

#include <string>

#include <stdio.h>

#include <cmath>

using namespace std;

class Complex

{

private:

double real;

double imaginary;

public:

Complex();

Complex(double n1);

Complex(double n1, double n2);

~Complex();

Complex operator+(const Complex &c)const;

Complex operator-(const Complex &c)const;

Complex operator\*(const Complex &c)const;

Complex operator\*(double n)const;

Complex operator~()const;

friend Complex operator\*(double n, const Complex &c);

friendostream&operator<<(ostream&os, const Complex &c);

friendistream&operator>>(istream&is, Complex &c);

};

#endif

//complex.cpp

#include "complexh.h"

Complex::Complex()

{

real = 0.0;

imaginary = 0.0;

}

Complex::Complex(double n1)

{

real = n1;

imaginary = 0.0;

}

Complex::Complex(double n1, double n2)

{

real = n1;

imaginary = n2;

}

Complex::~Complex()

{

}

Complex Complex::operator+(const Complex &c)const

{

return Complex(real + c.real, imaginary + c.imaginary);

}

Complex Complex::operator-(const Complex &c)const

{

return Complex(real - c.real, imaginary - c.imaginary);

}

Complex Complex::operator\*(const Complex &c)const

{

doublereal\_s;

doubleimaginary\_s;

real\_s = real\*c.real - imaginary\*c.imaginary;

imaginary\_s = real\*c.imaginary + imaginary\*c.real;

return Complex(real\_s, imaginary\_s);

}

Complex Complex::operator\*(double n)const

{

return Complex(n\*real, n\*imaginary);

}

Complex Complex::operator~()const

{

return Complex(real, -imaginary);

}

Complex operator\*(double n, const Complex &c)

{

return Complex(n\*c.real, n\*c.imaginary);

}

ostream&operator<<(ostream&os, const Complex &c)

{

os<< "(" <<c.real<< ", " <<c.imaginary<<"i)";

returnos;

}

istream&operator>>(istream&is, Complex &c)

{

cout<< "Real: ";

if (is >>c.real)

{

cout<< "Imaginary: ";

is>>c.imaginary;

}

return is;

}

//useComplex.cpp

#include "complexh.h"

int main()

{

Complex a(3.0, 4.0);

Complex c;

charch;

cout<< "Enter a complex number (q to quit): ";

while (cin>>ch)

{

if (ch == 'q' || ch == 'Q')

break;

else

{

cin>> c;

cout<< "c is " << c << '\n';

cout<< "Complex conjugate is " << ~c << '\n';

cout<< "a is " << a << '\n';

cout<< "a + c is " << a + c << '\n';

cout<< "a - c is " << a - c << '\n';

cout<< "a \* c is " << a \* c << '\n';

cout<< "2 \* c is " << 2 \* c << '\n';

}

cout<< "Enter a complex number (q to quit): ";

}

cout<< "Done!\n";

cin.get();

cin.get();

return 0;

}

第十二章编程练习答案

12.1 根据以下类声明，完成类，并编小程序使用它

*//12.1* 根据以下类声明，完成类，并编小程序使用它

#include <iostream>

#include <cstring>

using namespace std;

class Cow{

char name[20];

char \* hobby;

double weight;

public:

Cow();

Cow(const char \* nm, const char \* ho, double wt);

Cow(const Cow & C);

~Cow();

void ShowCow() const;

};

Cow::Cow(){}

Cow::Cow(const char \* nm, const char \* ho, double wt)

{

strcpy(name,nm);

hobby=new char[strlen(ho)+1];

strcpy(hobby,ho);

weight=wt;

}

Cow::Cow(const Cow & C)

{

strcpy(name,C.name);

hobby=new char[strlen(C.hobby)+1];

strcpy(hobby,C.hobby);

weight=C.weight;

}

Cow::~Cow() {delete [] hobby;}

void Cow::ShowCow() const

{

cout << name << endl;

cout << hobby << endl;

cout << weight << endl;

}

int main()

{

Cow cow;

Cow ccc("adads","dsdfsad",34);

cow=ccc;

cow.ShowCow();

ccc.ShowCow();

}

12.2 根据以下的主函数，编写类，使得：

a.重载+，使得两个字符串可以合并为一个

b.使用Stringlow()成员函数，使得字母可以转换为小写

c.使用Stringup()成员函数，使得字母可转换为大写

d.提供一个成员函数，使它返回一个char 字符出现的个数

*//12.2* 根据以下的主函数，编写类，使得：

*//a.*重载*+*，使得两个字符串可以合并为一个

*//b.*使用*Stringlow()*成员函数，使得字母可以转换为小写

*//c.*使用*Stringup()*成员函数，使得字母可转换为大写

*//d.*提供一个成员函数，使它返回一个*char* 字符出现的个数

#include <iostream>

#include <cstring>

#include <cctype>

using namespace std;

class String

{

char\* mp\_text;

unsigned m\_text\_length;

void assignMember (const char\* text)

{

m\_text\_length = strlen(text);

mp\_text = new char [m\_text\_length + 1];

strcpy(mp\_text, text);

}

public:

static const unsigned k\_buffer\_max\_size = 256;

const char\* toCstr () const

{

return (mp\_text);

}

String (const char\* text = "")

{

assignMember(text);

}

String (const String& str)

{

assignMember(str.toCstr());

}

~String ()

{

delete [] mp\_text;

}

unsigned getLength () const

{

return (m\_text\_length);

}

void stringup ()

{

for (unsigned i = 0; i < m\_text\_length; ++i)

mp\_text[i] = (char)toupper(mp\_text[i]);

}

void stringlow ()

{

for (unsigned i = 0; i < m\_text\_length; ++i)

mp\_text[i] = (char)tolower((int)mp\_text[i]);

}

unsigned has (char ch) const

{

unsigned cnt = 0;

for (unsigned i = 0; i < m\_text\_length; ++i)

if (ch == mp\_text[i])

++cnt;

return (cnt);

}

String& operator= (const String& str)

{

if (&str == this)

return (\*this);

delete [] mp\_text;

assignMember(str.toCstr());

return (\*this);

}

String & operator+= (const String& str)

{

return (\*this += str);

}

char& operator[] (unsigned idx)

{

return (mp\_text[idx]);

}

const char & operator[] (unsigned idx) const

{

return (mp\_text[idx]);

}

friend ostream & operator<< (ostream& os, const String& str)

{

os << str.toCstr();

return (os);

}

friend istream & operator>> (istream& is, String& str)

{

char txt[k\_buffer\_max\_size];

if (is >> txt)

str = txt;

is.ignore(k\_buffer\_max\_size, '\n');

return (is);

}

friend bool operator< (const String& lvalue, const String& rvalue)

{

return (strcmp(lvalue.toCstr(), rvalue.toCstr()) < 0);

}

friend bool operator> (const String& lvalue, const String& rvalue)

{

return (rvalue < lvalue);

}

friend bool operator== (const String& lvalue, const String& rvalue)

{

return (!(lvalue < rvalue) && !(lvalue > rvalue));

}

friend bool operator<= (const String& lvalue, const String& rvalue)

{

return (!(lvalue > rvalue));

}

friend bool operator>= (const String& lvalue, const String& rvalue)

{

return (!(lvalue < rvalue));

}

friend String operator+ (const String& lvalue, const String& rvalue)

{

char\* p\_txt = new char [lvalue.getLength() + rvalue.getLength() + 1];

strcpy(p\_txt, lvalue.toCstr());

strcat(p\_txt, rvalue.toCstr());

String tmp(p\_txt);

delete [] p\_txt;

return (tmp);

}

};

int main()

{

String s1(" and I am a C++ student.");

String s2 = "Please enter your name: ";

String s3;

cout << s2;

*// overloaded << operator*

cin >> s3;

*// overloaded >> operator*

s2 = "My name is " + s3;

*// overloaded =, + operators*

cout << s2 << ".\n";

s2 = s2 + s1;

s2.stringup();

*// converts string to uppercase*

cout << "The string\n" << s2 << "\ncontains " << s2.has('A')

<< " 'A' characters in it.\n";

s1 = "red";

*// tstring(const char \*),*

*// then tstring & operator=(const string&)*

String rgb[3] = { String(s1), String("green"), String("blue")};

cout << "enter the name of a primary color for mixing light: ";

String ans;

bool success = false;

while (cin >> ans)

{

ans.stringlow();

*// converts string to lowercase*

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

{

if (ans == rgb[i]) *// overloaded == operator*

{

cout << "That's right!\n";

success = true;

break;

}

}

if (success)

break;

else

cout << "Try again!\n";

}

cout << "Bye" << endl;

}

12.3 重新编写程序清单10.7,10.8，使用动态内存并重载<<代替show()

*//12.3* 重新编写程序清单*10.7,10.8*，使用动态内存并重载*<<*代替*show()*

#include <iostream>

#include <cstring>

using namespace std;

class Stock{

char \*company;

int shares;

double share\_val;

double total\_val;

void set\_tot(){total\_val=shares\*share\_val;};

public:

Stock(){

company=new char[8];

strcpy(company,"no name");

shares=0;

share\_val=0.0;

total\_val=0.0;

}

Stock(const char \*co,long n=0,double pr=0)

{

int len=strlen(co);

company=new char[len+1];

strcpy(company,co);

if(n<0)

{

cout<<"Number of shares can't be negative;"

<<company<<" shares set to 0"<<endl;

shares=0;

}

else

shares=n;

share\_val=pr;

set\_tot();

}

~Stock()

{

delete []company;

}

void buy(long num,double price)

{

if(num<0)

{

cout<<"Number of shares purchase can't be negative."

<<" Transaction is aborted."<<endl;

}

else

{

shares+=num;

share\_val=price;

set\_tot();

}

}

void sell(long num,double price)

{

if(num<0)

{

cout<<"Number of shares sold can't be negative."

<<"Transaction is aborted."<<endl;

}

else if(num>shares)

{

cout<<"You can't sell more than you have!"

<<"Transaction is aborted."<<endl;

}

else

{

shares-=num;

share\_val=price;

set\_tot();

}

}

void update(double price)

{

share\_val=price;

set\_tot();

}

const Stock &topval(const Stock &s)const

{

if(s.total\_val>total\_val)

return s;

else

return \*this;

}

friend ostream &operator<<(ostream &os,const Stock &s)

{

ios\_base::fmtflags orig=os.setf(ios\_base::fixed,ios\_base::floatfield);

streamsize prec=os.precision(3);

os<<"Company:"<<s.company

<<" Shares:"<<s.shares<<endl;

os<<" Share Price:$"<<s.share\_val;

os.precision(2);

os<<" Total Worth:&"<<s.total\_val<<endl;

os.setf(orig,ios\_base::floatfield);

os.precision(prec);

return os;

}

};

const int STKS = 4;

int main()

{

*// create an array of initialized objects*

Stock stocks[STKS] = {

Stock("NanoSmart", 12, 20.0),

Stock("Boffo Objects", 200, 2.0),

Stock("Monolithic Obelisks", 130, 3.25),

Stock("Fleep Enterprises", 60, 6.5)

};

cout << "Stock holdings:\n";

int st;

for (st = 0; st < STKS; st++)

cout << stocks[st];

*// set pointer to first element*

const Stock \* top = &stocks[0];

for (st = 1; st < STKS; st++)

top = &top->topval(stocks[st]);

*// now top points to the most valuable holding*

cout << "\nMost valuable holding:\n";

cout << \*top;

return 0;

}

12.4 按以下类声明，完成类，并编写一个演示程序

*//12.4* 按以下类声明，完成类，并编写一个演示程序

#include <iostream>

using namespace std;

typedef unsigned long Item;

class Stack{

enum{MAX=10};

Item \* items;

int size;

int top;

public:

Stack(int n=MAX)

{

items=new Item [MAX];

top=0;

size=0;

}

Stack(const Stack &st)

{

items=new Item[st.size];

top=0;

size=0;

for(int i=0;i<st.size;i++)

{

items[i]=st.items[i];

size++;

top++;

}

}

~Stack()

{

delete [] items;

}

bool isEmpty()

{

return top==0;

}

bool isFull()

{

return top==MAX;

}

bool push(const Item &it)

{

if(isFull())

cout<<"error! Stack is full!"<<endl;

else

{

items[top++]=it;

size++;

return true;

}

return false;

}

bool pop(Item &item)

{

if(isEmpty())

cout<<"error! Stack is empty!"<<endl;

else

{

item=items[top--];

size--;

return true;

}

return false;

}

Stack & operator = (Stack &st)

{

delete [] items;

items=new Item[st.size];

top=0;

size=0;

for(int i=0;i<st.size;i++)

{

items[i]=st.items[i];

size++;

top++;

}

return (\*this);

}

friend ostream & operator<<(ostream &os,const Stack & st)

{

os<<"This Stack is:"<<endl;

int len=st.top-1;

while(len!=-1)

{

cout<<st.items[len]<<endl;

len--;

}

return os;

}

};

int main ()

{

Stack s;

Item it[20]={0};

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

{

it[i]=i+1;

s.push(it[i]);

}

cout<<s;

Stack s1(s);

cout<<"s1="<<s1;

Stack s2=s;

cout<<s;

}

12.5-12.6 银行ATM 顾客系统

*// queue.h -- interface for a queue*

#ifndef QUEUE\_H\_

#define QUEUE\_H\_

*// This queue will contain Customer items*

class Customer

{

private:

long arrive; *// arrival time for customer*

int processtime; *// processing time for customer*

public:

Customer() : arrive(0), processtime (0){}

void set(long when);

long when() const { return arrive; }

int ptime() const { return processtime; }

};

typedef Customer Item;

class Queue

{

private:

*// class scope definitions*

*// Node is a nested structure definition local to this class*

struct Node { Item item; struct Node \* next;};

enum {Q\_SIZE = 10};

*// private class members*

Node \* front; *// pointer to front of Queue*

Node \* rear; *// pointer to rear of Queue*

int items; *// current number of items in Queue*

const int qsize; *// maximum number of items in Queue*

*// preemptive definitions to prevent public copying*

Queue(const Queue & q) : qsize(0) { }

Queue & operator=(const Queue & q) { return \*this;}

public:

Queue(int qs = Q\_SIZE); *// create queue with a qs limit*

~Queue();

bool isempty() const;

bool isfull() const;

int queuecount() const;

bool enqueue(const Item &item); *// add item to end*

bool dequeue(Item &item); *// remove item from front*

};

#endif

*// queue.cpp -- Queue and Customer methods*

#include "queue.h"

#include <cstdlib> // (or stdlib.h) for rand()

*// Queue methods*

Queue::Queue(int qs) : qsize(qs)

{

front = rear = NULL;*// or nullptr*

items = 0;

}

Queue::~Queue()

{

Node \* temp;

while (front != NULL) *// while queue is not yet empty*

{

temp = front; *// save address of front item*

front = front->next;*// reset pointer to next item*

delete temp; *// delete former front*

}

}

bool Queue::isempty() const

{

return items == 0;

}

bool Queue::isfull() const

{

return items == qsize;

}

int Queue::queuecount() const

{

return items;

}

*// Add item to queue*

bool Queue::enqueue(const Item & item)

{

if (isfull())

return false;

Node \* add = new Node; *// create node*

*// on failure, new throws std::bad\_alloc exception*

add->item = item; *// set node pointers*

add->next = NULL; *// or nullptr;*

items++;

if (front == NULL) *// if queue is empty,*

front = add; *// place item at front*

else

rear->next = add; *// else place at rear*

rear = add; *// have rear point to new node*

return true;

}

*// Place front item into item variable and remove from queue*

bool Queue::dequeue(Item & item)

{

if (front == NULL)

return false;

item = front->item; *// set item to first item in queue*

items--;

Node \* temp = front;*// save location of first item*

front = front->next;*// reset front to next item*

delete temp; *// delete former first item*

if (items == 0)

rear = NULL;

return true;

}

*// customer method*

*// when is the time at which the customer arrives*

*// the arrival time is set to when and the processing*

*// time set to a random value in the range 1 - 3*

void Customer::set(long when)

{

processtime = std::rand() % 3 + 1;

arrive = when;

}

*// bank.cpp -- using the Queue interface*

*// compile with queue.cpp*

#include <iostream>

#include <cstdlib> // for rand() and srand()

#include <ctime> // for time()

#include "queue.h"

const int MIN\_PER\_HR = 60;

bool newcustomer(double x); *// is there a new customer?*

int main()

{

using std::cin;

using std::cout;

using std::endl;

using std::ios\_base;

*// setting things up*

std::srand(std::time(0)); *// random initializing of rand()*

cout << "Case Study: Bank of Heather Automatic Teller\n";

cout << "Enter maximum size of queue: ";

int qs;

cin >> qs;

Queue line(qs); *// line queue holds up to qs people*

cout << "Enter the number of simulation hours: ";

int hours; *// hours of simulation*

cin >> hours;

*// simulation will run 1 cycle per minute*

long cyclelimit = MIN\_PER\_HR \* hours; *// # of cycles*

cout << "Enter the average number of customers per hour: ";

double perhour; *// average # of arrival per hour*

cin >> perhour;

double min\_per\_cust;*// average time between arrivals*

min\_per\_cust = MIN\_PER\_HR / perhour;

Item temp; *// new customer data*

long turnaways = 0; *// turned away by full queue*

long customers = 0; *// joined the queue*

long served = 0; *// served during the simulation*

long sum\_line = 0; *// cumulative line length*

int wait\_time = 0; *// time until autoteller is free*

long line\_wait = 0; *// cumulative time in line*

*// running the simulation*

for (int cycle = 0; cycle < cyclelimit; cycle++)

{

if (newcustomer(min\_per\_cust)) *// have newcomer*

{

if (line.isfull())

turnaways++;

else

{

customers++;

temp.set(cycle); *// cycle = time of arrival*

line.enqueue(temp); *// add newcomer to line*

}

}

if (wait\_time <= 0 && !line.isempty())

{

line.dequeue (temp); *// attend next customer*

wait\_time = temp.ptime(); *// for wait\_time minutes*

line\_wait += cycle - temp.when();

served++;

}

if (wait\_time > 0)

wait\_time--;

sum\_line += line.queuecount();

}

*// reporting results*

if (customers > 0)

{

cout << "customers accepted: " << customers << endl;

cout << " customers served: " << served << endl;

cout << " turnaways: " << turnaways << endl;

cout << "average queue size: ";

cout.precision(2);

cout.setf(ios\_base::fixed, ios\_base::floatfield);

cout << (double) sum\_line / cyclelimit << endl;

cout << " average wait time: "

<< (double) line\_wait / served << " minutes\n";

}

else

cout << "No customers!\n";

cout << "Done!\n";

*// cin.get();*

*// cin.get();*

return 0;

}

*// x = average time, in minutes, between customers*

*// return value is true if customer shows up this minute*

bool newcustomer(double x)

{

return (std::rand() \* x / RAND\_MAX < 1);

}

第十三章编程练习答案

13.1 根据Cd 基类，完成派生出一个Classic 类，并

测试

//13.1 根据Cd 基类，完成派生出一个Classic 类，并测试

#include <iostream>

#include <cstring>

using namespace std;

// base class

class Cd

{

char performers[50];

char label[20];

int selections; // number of selections

double playtime; // playing time in minutes

public:

explicit Cd(const char \* s1 = "", const char \* s2 = "", int n =

0, double x = 0.0);

virtual ~Cd() {}

virtual void Report() const; // reports all CD data

};

static void cpStr (char\* p\_des\_txt, const char\* p\_src\_txt, unsigned

des\_arr\_size)

{

unsigned str\_len = strlen(p\_src\_txt) < des\_arr\_size-1 ?

strlen(p\_src\_txt) : des\_arr\_size-1;

strncpy(p\_des\_txt, p\_src\_txt, str\_len);

p\_des\_txt[str\_len] = '\0';

}

Cd::Cd (const char \* s1, const char \* s2, int n, double x)

: selections(n), playtime(x)

{

cpStr(performers, s1, 50);

cpStr(label, s2, 20);

}

void Cd::Report() const

{

cout << performers << ", " << label << ", " << selections << ",

" << playtime << flush;

}

class Classic : public Cd

{

static const unsigned mk\_size = 64;

char m\_songs[mk\_size];

public:

Classic (const char\* songs\_list = "", const char \* s1 = "", const

char \* s2 = "", int n = 0, double x = 0.0);

virtual void Report() const; // reports all CD data

};

Classic::Classic (const char\* songs\_list, const char \* s1, const char \*

s2, int n, double x)

: Cd(s1, s2, n, x)

{

cpStr(m\_songs, songs\_list, mk\_size);

}

void Classic::Report () const

{

Cd::Report();

cout << ", " << m\_songs << endl;

}

void Bravo(const Cd & disk)

{

disk.Report();

cout << endl;

}

int main()

{

Cd c1("Beatles", "Capitol", 14, 35.5);

Classic c2 = Classic("Piano Sonata in B flat, Fantasia in C",

"Alfred Brendel", "Philips", 2, 57.17);

Cd \*pcd = &c1;

cout << "Using object directly:\n";

c1.Report(); // use Cd method

c2.Report(); // use Classic method

cout << "Using type cd \* pointer to objects:\n";

pcd->Report(); // use Cd method for cd object

pcd = &c2;

pcd->Report(); // use Classic method for classic object

cout << "Calling a function with a Cd reference argument:\n";

Bravo(c1);

Bravo(c2);

cout << "Testing assignment: ";

Classic copy;

copy = c2;

copy.Report();

}</cstring></iostream>

13.2 对13.1,使用动态内存记录字符串

//13.2 对13.1,使用动态内存记录字符串

#include <iostream>

#include <cstring>

using namespace std;

// base class

class Cd

{

char\* performers;

char\* label;

int selections; // number of selections

double playtime; // playing time in minutes

public:

explicit Cd(const char \* s1 = "", const char \* s2 = "", int n = 0, double x = 0.0);

Cd(const Cd & d);

virtual ~Cd();

virtual void Report() const; // reports all CD data

Cd & operator=(const Cd & d);

};

static char\* cpNewStr (const char\* p\_src\_txt)

{

unsigned str\_len = strlen(p\_src\_txt);

char\* p\_des\_txt = new char [str\_len + 1];

strcpy(p\_des\_txt, p\_src\_txt);

return (p\_des\_txt);

}

Cd::Cd (const char \* s1, const char \* s2, int n, double x)

: selections(n), playtime(x)

{

performers = cpNewStr(s1);

label = cpNewStr(s2);

}

Cd::~Cd ()

{

delete [] performers;

delete [] label;

}

Cd::Cd(const Cd & d)

: selections(d.selections), playtime(d.playtime)

{

performers = cpNewStr(d.performers);

label = cpNewStr(d.label);

}

Cd & Cd::operator=(const Cd & d)

{

if (&d == this) {

return (\*this);

}

delete [] performers;

performers = cpNewStr(d.performers);

delete [] label;

label = cpNewStr(d.label);

selections = d.selections;

playtime = d.playtime;

return (\*this);

}

void Cd::Report() const

{

cout << performers << ", " << label << ", " << selections << ", " << playtime << flush;

}

// derive

class Classic : public Cd

{

char\* songs;

public:

explicit Classic (const char\* songs\_list = "", const char \* s1 = "", const char \* s2 = "", int n = 0, double x = 0.0);

Classic (const Classic& classic);

virtual ~Classic ();

Classic& operator= (const Classic& classic);

virtual void Report() const; // reports all CD data

};

Classic::Classic (const char\* songs\_list, const char \* s1, const char \* s2, int n, double x)

: Cd(s1, s2, n, x)

{

songs = cpNewStr(songs\_list);

}

Classic::Classic (const Classic& classic)

: Cd(classic)

{

songs = cpNewStr(classic.songs);

}

Classic::~Classic ()

{

delete [] songs;

}

Classic & Classic::operator= (const Classic& classic)

{

if (&classic == this)

return (\*this);

Cd::operator=(classic);

delete [] songs;

songs = cpNewStr(classic.songs);

return (\*this);

}

void Classic::Report () const

{

Cd::Report();

cout << ", " << songs << endl;

}

void Bravo(const Cd & disk)

{

disk.Report();

cout << endl;

}

int main()

{

Cd c1("Beatles", "Capitol", 14, 35.5);

Classic c2 = Classic("Piano Sonata in B flat, Fantasia in C", "Alfred Brendel", "Philips", 2, 57.17);

Cd \*pcd = &c1;

cout << "Using object directly:\n";

c1.Report(); // use Cd method

c2.Report(); // use Classic method

cout << "Using type cd \* pointer to objects:\n";

pcd->Report(); // use Cd method for cd object

pcd = &c2;

pcd->Report(); // use Classic method for classic object

cout << "Calling a function with a Cd reference argument:\n";

Bravo(c1);

Bravo(c2);

cout << "Testing assignment: ";

Classic copy;

copy = c2;

copy.Report();

}</cstring></iostream>

13.3 让三个类从一个基类DMA 继承而来，然后用程序

清单13.10 对比测试，基类使用虚类。

//13.3 让三个类从一个基类DMA 继承而来，然后用程序清单13.10 对比测试，基类使用虚类。

#include <iostream>

#include <string>

using namespace std;

class DMA{

string label;

int rating;

public:

DMA(const string l="null",int r=0)

{

label=l;

rating=r;

}

virtual void test(){};

virtual void tese2() { cout<<"test2"; }

DMA(const DMA &rs)

{

label=rs.label;

rating=rs.rating;

}

virtual ~DMA() {}

string lab() {return label;}

int ra() {return rating;}

friend ostream&operator<<(ostream &os,const DMA &rs)

{

os<<"label:"<<rs.label<<" rating:"<<rs.rating<<endl;="" return="" os;="" }="" virtual="" void="" show()="" {=""

cout<<"label:"<<label<<"="" rating:"<<rating<<"="" "<<endl;="" };="" class="" basedma:public="" dma="" public:=""

basedma(const="" string="" l="null" ,int="" r="0):DMA(l,r)" {}="" basedma(basedma="" &bd):dma(bd.lab(),bd.ra())=""

test()const{};="" ~basedma(){}="" friend="" ostream&operator<<(ostream="" &os,const="" basedma="" &bd)=""

os<<"this="" is="" basedma:="" ";="" os<<(dma="" &)bd;="" cout<<"this="" dma::show();="" cout<<endl;=""

lacksdma:public="" color;="" lacksdma(const="" c="blank" ,const="" color="c;" ~lacksdma(){};="" 必须实现虚基类的所

有虚函数="" lacksdma="" &ld)="" lacksdma:="" &)ld<<"="" color:"<<ld.color;="" 通过强制类型转换调用基类友元函

数="" cout<<"="" color:"<<color;="" hasdma:public="" style;="" hasdma(const="" s="none" style="s;" ~hasdma(){};=""

hasdma:="" style:"<<style;="" hasdma="" &hd)="" &)hd<<"="" style:"<<hd.style;="" int="" main="" ()="" \*pd[3];="" 虚

基类不能创建对象，但可以创建指向其的指针="" for(int="" i="0;i<3;i++)" cout<<"\nenter="" the="" label:";=""

label;="" getline(cin,label,&#39;\n&#39;);="" rating:";="" rat;="" cin="">>rat;

cout<<"Enter the 1 for baseDMA"<<endl <<"2="" for="" lacksdma"<<endl="" <<"3="" hasdma"<<endl;=""

int="" temp;="" cin="">>temp;

cin.get();

if(temp==1)

pd[i]=new baseDMA(label,rat);

else if(temp==2)

{

cout<<"Enter the color:";

string color;

getline(cin,color);

pd[i]=new lacksDMA(color,label,rat);

}

else if(temp==3)

{

cout<<"Enter the style:";

string style;

getline(cin,style);

pd[i]=new hasDMA(style,label,rat);

}

else

{

cout<<"invalid input! try again!"<<endl; i--;="" }="" while(cin.get()!="'\n')" continue;="" cout<<endl;=""

for(int="" i="0;i<3;i++)" pd[i]-="">show();

}</endl;></endl></rs.label<<"></string></iostream>

13.4 根据Port 类派生出一个VintagePort 类，完成

并测试

//13.4 根据Port 类派生出一个VintagePort 类，完成并测试

#include <iostream>

#include <cstring>

using namespace std;

class Port

{

char \* brand;

char style[20]; // i.e., tawny, ruby, vintage

int bottles;

public:

explicit Port(const char \* br = "none", const char \* st = "none", int b = 0);

Port(const Port & p); // copy constructor

virtual ~Port() { delete [] brand; }

Port & operator=(const Port & p);

virtual void Show() const;

Port & operator+=(int b); // adds b to bottles

Port & operator-=(int b); // subtracts b from bottles, if available

int BottleCount() const { return bottles; }

friend ostream & operator<<(ostream & os, const Port & p);

};

static char\* cpNewStr (const char\* p\_src\_txt)

{

unsigned str\_len = strlen(p\_src\_txt);

char\* p\_des\_txt = new char [str\_len + 1];

strcpy(p\_des\_txt, p\_src\_txt);

return (p\_des\_txt);

}

static void cpStr (char\* p\_des\_txt, const char\* p\_src\_txt, unsigned des\_arr\_size)

{

unsigned str\_len = strlen(p\_src\_txt) < des\_arr\_size-1 ? strlen(p\_src\_txt) : des\_arr\_size-1;

strncpy(p\_des\_txt, p\_src\_txt, str\_len);

p\_des\_txt[str\_len] = '\0';

}

Port::Port (const char \* br, const char \* st, int b)

: brand(cpNewStr(br)), bottles(b)

{

cpStr(style, st, 20);

}

Port::Port(const Port & p)

: brand(cpNewStr(p.brand)), bottles(p.bottles)

{

cpStr(style, p.style, 20);

}

void Port::Show() const

{

cout << "Brand: " << brand << endl

<< "Style: " << style << endl

<< "Bottles: " << bottles << flush;

}

Port & Port::operator=(const Port & p)

{

if (&p == this)

return (\*this);

delete [] brand;

brand = cpNewStr(p.brand);

cpStr(style, p.style, 20);

bottles = p.bottles;

return (\*this);

}

Port & Port::operator+=(int b)

{

bottles += b;

return (\*this);

}

Port & Port::operator-=(int b)

{

bottles -= b;

return (\*this);

}

ostream & operator<< (ostream & os, const Port & p)

{

cout << p.brand << ", " << p.style << ", " << p.bottles << flush;

return (os);

}

class VintagePort : public Port // style necessarily = "vintage"

{

char \* nickname; // i.e., "The Noble" or "Old Velvet", etc.

int year; // vintage year

public:

explicit VintagePort(const char \* br = "", int b = 0, const char \* nn = "", int y = 0);

VintagePort(const VintagePort & vp);

virtual ~VintagePort() { delete [] nickname; }

VintagePort & operator=(const VintagePort & vp);

virtual void Show() const;

friend ostream & operator<<(ostream & os, const VintagePort & vp);

};

VintagePort::VintagePort (const char \* br, int b, const char \* nn, int y)

: Port(br, "vintage", b), nickname(cpNewStr(nn)), year(y) {}

VintagePort::VintagePort (const VintagePort & vp)

: Port(vp), nickname(cpNewStr(vp.nickname)), year(vp.year) {}

void VintagePort::Show () const

{

Port::Show();

cout << endl;

cout << "Nickname: " << nickname << endl;

cout << "Year: " << year << flush;

}

VintagePort & VintagePort::operator= (const VintagePort & vp)

{

if (&vp == this)

return (\*this);

Port::operator=(vp);

delete [] nickname;

nickname = cpNewStr(vp.nickname);

year = vp.year;

return (\*this);

}

ostream & operator<< (ostream & os, const VintagePort & vp)

{

os << Port(vp);

cout << ", " << vp.nickname << ", " << vp.year << flush;

return (os);

}

int main()

{

Port port1("gallo", "tawny", 20);

cout << port1 << endl << endl;

VintagePort vp("gallo", 24, "nice", 16);

VintagePort vp2(vp);

cout << vp2 << endl << endl;

VintagePort vp3;

vp3 = vp;

cout << vp3 << endl << endl;

Port\* p\_port;

p\_port = &port1;

p\_port->Show();

cout << endl;

p\_port = &vp;

p\_port->Show();

cout << endl;

}</cstring></iostream>

//14 章

1、

//winec.h

#ifndef WINEC\_H\_

#define WINEC\_H\_

#include <iostream>

#include <string>

#include <valarray>

using namespace std;

template<class T1, class T2>

class Pair

{

private:

T1 year;

T2 bottles;

public:

Pair(const T1 &yr, const T2 &bt) :year(yr), bottles(bt){}

Pair(){}

void Set(const T1 &yr, const T2 &bt);

int Sum()const;

void Show(int y)const;

};

template<class T1, class T2>

void Pair<T1,T2>::Set(const T1 &yr, const T2 &bt)

{

year = yr;

bottles = bt;

}

template<class T1,class T2>

int Pair<T1, T2>::Sum()const

{

returnbottles.sum();

}

template<class T1, class T2>

void Pair<T1,T2>::Show(int y)const

{

for (inti = 0; i< y; i++)

cout<< "\t" << year[i] << "\t" << bottles[i] <<endl;

}

typedefvalarray<int>ArrayInt;

typedef Pair<ArrayInt, ArrayInt>PairArray;

class Wine

{

private:

PairArrayyb;

stringfullname;

intyrs;

public:

Wine(){}

Wine(const char \*l, int y, constintyr[], constint bot[]);

Wine(const char \*l, int y);

voidGetBottles();

string&Label();

void Show()const;

int sum()const;

};

#endif

//winec.cpp

#include "winec.h"

Wine::Wine(const char \*l, int y, constintyr[], constint bot[])

{

fullname = l;

yrs = y;

yb.Set(ArrayInt(yr, yrs), ArrayInt(bot, yrs));

}

Wine::Wine(const char \*l, int y)

{

fullname = l;

yrs = y;

}

void Wine::GetBottles()

{

ArrayIntyr(yrs), bt(yrs);

for (inti = 0; i<yrs; i++)

{

cout<< "Enter the year: ";

cin>>yr[i];

cout<< "Enter the bottles: ";

cin>>bt[i];

}

while (cin.get() != '\n')

continue;

yb.Set(yr, bt);

}

string&Wine::Label()

{

returnfullname;

}

void Wine::Show()const

{

cout<< "Wine: " <<fullname<<endl;

cout<< "\tYear\tBottles\n";

yb.Show(yrs);

}

int Wine::sum()const

{

returnyb.Sum();

}

//main.cpp

#include "winec.h"

int main(void)

{

cout<< "Enter name of wine: ";

char lab[50];

cin.getline(lab, 50);

cout<< "Enter number of years: ";

intyrs;

cin>>yrs;

Wine holding(lab, yrs);

holding.GetBottles();

holding.Show();

constint YRS = 3;

int y[YRS] = { 1993, 1995, 1998 };

int b[YRS] = { 48, 60, 72 };

Wine more("Gushing Grape Red", YRS, y, b);

more.Show();

cout<< "Total bottles for " <<more.Label()

<< ": " <<more.sum() <<endl;

cout<< "Bye\n";

system("pause");

return 0;

}

14.2

//winec.h

#ifndef WINEC\_H\_

#define WINEC\_H\_

#include <iostream>

#include <string>

#include <valarray>

using namespace std;

template<class T1, class T2>

class Pair

{

private:

T1 year;

T2 bottles;

public:

Pair(const T1 &yr, const T2 &bt) :year(yr), bottles(bt){}

Pair(){}

void Set(const T1 &yr, const T2 &bt);

int Sum()const;

void Show(int y)const;

};

template<class T1, class T2>

void Pair<T1,T2>::Set(const T1 &yr, const T2 &bt)

{

year = yr;

bottles = bt;

}

template<class T1,class T2>

int Pair<T1, T2>::Sum()const

{

returnbottles.sum();

}

template<class T1, class T2>

void Pair<T1,T2>::Show(int y)const

{

for (inti = 0; i< y; i++)

cout<< "\t" << year[i] << "\t" << bottles[i] <<endl;

}

typedefvalarray<int>ArrayInt;

typedef Pair<ArrayInt, ArrayInt>PairArray;

class Wine :private PairArray, private string

{

private:

intyrs;

public:

Wine(){}

Wine(const char \*l, int y, constintyr[], constint bot[]);

Wine(const char \*l, int y);

voidGetBottles();

string&Label();

void Show()const;

int sum()const;

};

#endif

//winec.cpp

#include "winec.h"

Wine::Wine(const char \*l, int y, constintyr[], constint bot[]) :string(l), yrs(y), PairArray(ArrayInt(yr,

y), ArrayInt(bot, y))

{

}

Wine::Wine(const char \*l, int y) : string(l), yrs(y)

{

}

void Wine::GetBottles()

{

ArrayIntyr(yrs), bt(yrs);

for (inti = 0; i<yrs; i++)

{

cout<< "Enter the year: ";

cin>>yr[i];

cout<< "Enter the bottles: ";

cin>>bt[i];

}

while (cin.get() != '\n')

continue;

PairArray::Set(yr, bt);

}

string&Wine::Label()

{

return (string &)(\*this);

}

void Wine::Show()const

{

cout<< "Wine: " << (string &)(\*this) <<endl;

cout<< "\tYear\tBottles\n";

PairArray::Show(yrs);

}

int Wine::sum()const

{

returnPairArray::Sum();

}

//main.cpp

#include "winec.h"

int main(void)

{

cout<< "Enter name of wine: ";

char lab[50];

cin.getline(lab, 50);

cout<< "Enter number of years: ";

intyrs;

cin>>yrs;

Wine holding(lab, yrs);

holding.GetBottles();

holding.Show();

constint YRS = 3;

int y[YRS] = { 1993, 1995, 1998 };

int b[YRS] = { 48, 60, 72 };

Wine more("Gushing Grape Red", YRS, y, b);

more.Show();

cout<< "Total bottles for " <<more.Label()

<< ": " <<more.sum() <<endl;

cout<< "Bye\n";

system("pause");

return 0;

}

3、

//queuetp.h

#ifndef QUEUETP\_H\_

#define QUEUETP\_H\_

#include <iostream>

#include <string>

#include <cstring>

using namespace std;

template<typename T>

classQueueTp

{

private:

struct Node { T item; struct Node \*next; };

Node \*front;

Node \*rear;

int items;

constintqsize;

QueueTp(constQueueTp&q) :qsize(0){}

QueueTp&operator=(constQueueTp&q){ return \*this; }

public:

QueueTp(intqs = 10);

~QueueTp();

boolisempty()const;

boolisfull()const;

intqueuecount()const;

boolenqueue(const T &item);

booldequeue(T &item);

};

template<typename T>

QueueTp<T>::QueueTp(intqs) :qsize(qs)

{

front = rear = NULL;

items = 0;

}

template<typename T>

QueueTp<T>::~QueueTp()

{

Node \*temp;

while (front != NULL)

{

temp = front;

front = front->next;

delete temp;

}

}

template<typename T>

boolQueueTp<T>::isempty()const

{

return items == 0;

}

template<typename T>

boolQueueTp<T>::isfull()const

{

return items == qsize;

}

template<typename T>

intQueueTp<T>::queuecount()const

{

return items;

}

template<typename T>

boolQueueTp<T>::enqueue(const T &item)

{

if (isfull())

return false;

Node \*add = new Node;

add->item = item;

add->next = NULL;

items++;

if (front == NULL)

front = add;

else

rear->next = add;

rear = add;

return true;

}

template<typename T>

boolQueueTp<T>::dequeue(T &item)

{

if (front == NULL)

return false;

item = front->item;

items--;

Node \*temp = front;

front = front->next;

delete temp;

if (items == 0)

rear = NULL;

return true;

}

class Worker

{

private:

stringfullname;

long id;

public:

Worker() :fullname("no one"), id(0L){}

Worker(const string &s, long n) :fullname(s), id(n){}

~Worker();

void Set();

void Show()const;

};

#endif

//workermi.cpp

#include "queuetp.h"

Worker::~Worker(){}

void Worker::Show()const

{

cout<< "Name: " <<fullname<<endl;

cout<< "Employee ID: " << id <<endl;

}

void Worker::Set()

{

cout<< "Enter worker's name: ";

getline(cin, fullname);

cout<< "Enter worker's ID: ";

cin>> id;

while (cin.get() != '\n')

continue;

}

//main.cpp

#include "queuetp.h"

constint Size = 5;

int main()

{

QueueTp<Worker \*>lolas(Size);

Worker \*temp;

intct;

for (ct = 0; ct< Size; ct++)

{

charch;

cout<< "Enter the command:\n"

<< "A or a enter queue, "

<< "P or p delete queue, "

<< "Q or q quit.\n";

cin>>ch;

while (strchr("apq", ch) == NULL)

{

cout<< "Please enter a p or q: ";

cin>>ch;

}

if (ch == 'q')

break;

switch(ch)

{

case'a':

temp = new Worker;

cin.get();

temp->Set();

if (lolas.isfull())

cout<< "Queue already full\n";

else

lolas.enqueue(temp);

break;

case'p':

if (lolas.isempty())

cout<< "Queue already empty\n";

else

lolas.dequeue(temp);

break;

}

}

cout<< "\nHere the total count: ";

cout<<lolas.queuecount();

cout<< "Done.\n";

system("pause");

return 0;

}

4、

//person.h

#ifndef PERSON\_H\_

#define PERSON\_H\_

#include <iostream>

#include <string>

#include <cstdlib>

#include <cstring>

using namespace std;

class Person

{

private:

stringfirstname;

stringlastname;

protected:

virtual void Data()const;

virtual void Get();

public:

Person():firstname("no one"),lastname("no one"){}

Person(const string &f,const string &l):firstname(f),lastname(l){}

Person(const Person &p):Person(p){}

virtual ~Person() = 0;

virtual void Set() = 0;

virtual void Show()const = 0;

};

classGunslinger:virtual public Person

{

private:

intnumsk;

protected:

void Data()const;

void Get();

public:

Gunslinger():numsk(0),Person(){}

Gunslinger(intnk, const string &f, const string &l) :numsk(nk), Person(f, l){}

Gunslinger(intnk, const Person &p):numsk(nk),Person(p){}

void Show()const;

void Set();

double Draw()const;

};

classPokerPlayer:virtual public Person

{

protected:

void Data()const;

public:

PokerPlayer():Person(){}

PokerPlayer(const string &f, const string &l) : Person(f, l){}

PokerPlayer(const Person &p):Person(p){}

int Draw()const;

void Show()const;

void Set(){ Person::Set(); }

};

classBadDude:publicGunslinger,publicPokerPlayer

{

protected:

void Data()const;

void Get();

public:

BadDude(){}

BadDude(intnk , const string &f, const string &l)

:Person(f, l), Gunslinger(nk, f, l), PokerPlayer(f, l){}

BadDude(intnk, const Person &p)

:Person(p), Gunslinger(nk, p), PokerPlayer(p){}

BadDude(const Gunslinger &g)

:Person(g),Gunslinger(g),PokerPlayer(g){}

BadDude(intnk, constPokerPlayer&po)

:Person(po), Gunslinger(nk, po), PokerPlayer(po){}

doubleGdraw()const;

intCdraw()const;

void Set();

void Show()const;

};

#endif

//person.cpp

#include "person.h"

Person::~Person(){}

void Person::Data()const

{

cout<< "First name is : " <<firstname<<endl;

cout<< "Last name is : " <<lastname<<endl;

}

void Person::Get()

{

cout<< "Enter first name: \n";

getline(cin, firstname);

cout<< "Enter last name: \n";

getline(cin, lastname);

}

void Person::Show()const

{

Data();

}

void Person::Set()

{

Get();

}

void Gunslinger::Data()const

{

cout<< "Nick is :" <<numsk<<endl;

cout<< "The time of get the gun :" << Gunslinger::Draw() <<endl;

}

void Gunslinger::Get()

{

cout<< "Enter Nick: \n";

cin>>numsk;

}

void Gunslinger::Set()

{

cout<< "Enter Guns name: \n";

Person::Get();

Get();

}

void Gunslinger::Show()const

{

cout<< "Gunslinger: \n";

Person::Data();

Data();

}

double Gunslinger::Draw()const

{

return rand() % 3 + 1;

}

intPokerPlayer::Draw()const

{

return rand() % 52 + 1;

}

voidPokerPlayer::Data()const

{

cout<< "The cards :" << Draw() <<endl;

}

voidPokerPlayer::Show()const

{

cout<< "PokerPlayer :\n";

Person::Data();

Data();

}

doubleBadDude::Gdraw()const

{

return Gunslinger::Draw();

}

intBadDude::Cdraw()const

{

returnPokerPlayer::Draw();

}

voidBadDude::Data()const

{

Gunslinger::Data();

PokerPlayer::Data();

cout<< "The next cards: " <<Cdraw() <<endl;

cout<< "The time of BadDude get the gun: " <<Gdraw() <<endl;

}

voidBadDude::Get()

{

Gunslinger::Get();

}

voidBadDude::Set()

{

cout<< "Enter BadDude name: \n";

Person::Get();

Get();

}

voidBadDude::Show()const

{

cout<< "BadDude: \n";

Person::Data();

Data();

}

//main.cpp

#include "person.h"

constint Size=5;

int main ()

{

Person \*per[Size];

intct;

for (ct = 0; ct< Size; ct++)

{

char choice;

cout<< "Enter the Person: \n"

<< "g: gunslinger p: poker "

<< "b: bad dude q: quit\n";

cin>> choice;

while (strchr("gpbq", choice) == NULL)

{

cout<< "Please enter a p,g,o,q: ";

cin>> choice;

}

if (choice == 'q')

break;

switch (choice)

{

case'g':

per[ct] = new Gunslinger;

break;

case'p':

per[ct] = new PokerPlayer;

break;

case'b':

per[ct] = new BadDude;

break;

}

cin.get();

per[ct]->Set();

}

cout<< "\nHere is your staff:\n";

inti;

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

{

cout<<endl;

per[i]->Show();

}

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

delete per[i];

cout<< "Bye\n";

system("pause");

return 0;

}

5、

//emp.h

#ifndef EMP\_H\_

#define EMP\_H\_

#include <iostream>

#include <string>

using namespace std;

classabstr\_emp

{

private:

stringfname;

stringlname;

string job;

public:

abstr\_emp();

abstr\_emp(const string &fn, const string &ln,

const string &j);

virtual void ShowAll()const;

virtual void SetAll();

friendostream&operator<<(ostream&os, constabstr\_emp&e);

virtual ~abstr\_emp() = 0;

};

class employee :public abstr\_emp

{

public:

employee();

employee(const string &fn, const string &ln,

const string &j);

virtual void ShowAll()const;

virtual void SetAll();

};

class manager :virtual public abstr\_emp

{

private:

intinchargeof;

protected:

intInChargeOf()const { return inchargeof; }

int&InChargeOf(){ return inchargeof; }

public:

manager();

manager(const string &fn, const string &ln,

const string &j, intico = 0);

manager(constabstr\_emp&e, intico = 0);

manager(const manager &m);

virtual void ShowAll()const;

virtual void SetAll();

voidgetInCharge(){

cout<< "Enter inchargeof: ";

cin>>inchargeof;

}

};

class fink :virtual public abstr\_emp

{

private:

stringreportsto;

protected:

const string ReportsTo()const{ return reportsto; }

string&ReportsTo(){ return reportsto; }

public:

fink();

fink(const string &fn, const string &ln,

const string &j, const string &rpo);

fink(constabstr\_emp&e, const string &rpo);

fink(const fink &e);

virtual void ShowAll()const;

virtual void SetAll();

voidgetReportsTo(){

cout<< "Enter reportsto: ";

cin>>reportsto;

}

};

classhighfink :public manager, public fink

{

public:

highfink();

highfink(const string &fn, const string &ln,

const string &j, const string &rpo, intico = 0);

highfink(constabstr\_emp&e, const string &rpo, intico = 0);

highfink(const fink &f, intico = 0);

highfink(const manager &m, const string &rpo);

highfink(consthighfink&h);

virtual void ShowAll()const;

virtual void SetAll();

};

#endif

//emp.cpp

#include "emp.h"

abstr\_emp::abstr\_emp() :fname("no one"), lname("no one"), job("no job")

{

}

abstr\_emp::abstr\_emp(const string &fn, const string &ln,

const string &j) : fname(fn), lname(ln), job(j)

{

}

voidabstr\_emp::ShowAll()const

{

cout<< "Firstname: " <<fname<<endl;

cout<< "Lastname: " <<lname<<endl;

cout<< "Job is: " << job <<endl;

}

voidabstr\_emp::SetAll()

{

cout<< "Enter firstname: ";

getline(cin, fname);

cout<< "Enter lastname: ";

getline(cin, lname);

cout<< "Enter position: ";

getline(cin, job);

}

ostream&operator<<(ostream&os, constabstr\_emp&e)

{

os<<e.fname<< " " <<e.lname<< ", " <<e.job<<endl;

returnos;

}

abstr\_emp::~abstr\_emp()

{

}

employee::employee() :abstr\_emp()

{

}

employee::employee(const string &fn, const string &ln,

const string &j) : abstr\_emp(fn, ln, j)

{

}

void employee::ShowAll()const

{

abstr\_emp::ShowAll();

}

void employee::SetAll()

{

abstr\_emp::SetAll();

}

manager::manager() :abstr\_emp()

{

}

manager::manager(const string &fn, const string &ln,

const string &j, intico) : abstr\_emp(fn, ln, j), inchargeof(ico)

{

}

manager::manager(constabstr\_emp&e, intico) : abstr\_emp(e), inchargeof(ico)

{

}

manager::manager(const manager &m) : abstr\_emp(m)

{

}

void manager::ShowAll()const

{

abstr\_emp::ShowAll();

cout<< "Inchargeof: " <<InChargeOf() <<endl;

}

void manager::SetAll()

{

abstr\_emp::SetAll();

cout<< "Enter inchargeof: ";

(cin>>inchargeof).get();

}

fink::fink() :abstr\_emp()

{

}

fink::fink(const string &fn, const string &ln,

const string &j, const string &rpo) : abstr\_emp(fn, ln, j), reportsto(rpo)

{

}

fink::fink(constabstr\_emp&e, const string &rpo) : abstr\_emp(e), reportsto(rpo)

{

}

fink::fink(const fink &e) : abstr\_emp(e)

{

}

void fink::ShowAll()const

{

abstr\_emp::ShowAll();

cout<< "Reportsto: " <<ReportsTo() <<endl;

}

void fink::SetAll()

{

abstr\_emp::SetAll();

cout<< "Enter reportsto: ";

cin>>reportsto;

}

highfink::highfink() :abstr\_emp(), manager(), fink()

{

}

highfink::highfink(const string &fn, const string &ln,

const string &j, const string &rpo, intico) : abstr\_emp(fn, ln, j), manager(fn, ln, j, ico), fink(fn,

ln, j, rpo)

{

}

highfink::highfink(constabstr\_emp&e, const string &rpo, intico) : abstr\_emp(e), manager(e, ico),

fink(e, rpo)

{

}

highfink::highfink(const fink &f, intico) : abstr\_emp(f), manager(f, ico), fink(f)

{

}

highfink::highfink(const manager &m, const string &rpo) : abstr\_emp(m), manager(m), fink(m,

rpo)

{

}

highfink::highfink(consthighfink&h) : abstr\_emp(h), manager(h), fink(h)

{

}

voidhighfink::ShowAll()const

{

abstr\_emp::ShowAll();

cout<< "InChargeOf: " << manager::InChargeOf() <<endl;

cout<< "ReportsTo: " << fink::ReportsTo() <<endl;

}

voidhighfink::SetAll()

{

abstr\_emp::SetAll();

manager::getInCharge();

fink::getReportsTo();

}

//useemp.cpp

#include "emp.h"

int main(void)

{

employeeem("Trip", "Harris", "Thumper");

cout<<em<<endl;

em.ShowAll();

manager ma("Amorphia", "Spindragon", "Nuancer", 5);

cout<< ma <<endl;

ma.ShowAll();

fink fi("Matt", "Oggs", "Oiler", "Juno Barr");

cout<< fi <<endl;

fi.ShowAll();

highfinkhf(ma, "Curly Kew");

hf.ShowAll();

cout<< "Press a key for next phase:\n";

cin.get();

highfink hf2;

hf2.SetAll();

cout<< "Using an abstr\_emp \* pointer:\n";

abstr\_emp \*tri[4] = { &em, &fi, &hf, &hf2 };

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

tri[i]->ShowAll();

system("pause");

return 0;

}

//15

1、

//tv.h

#ifndef TV\_H\_

#define TV\_H\_

#include <iostream>

using namespace std;

classTv

{

friend class Remote;

public:

enum { Off, On };

enum { MinVal, MaxVal = 20 };

enum { Antenna, Cable };

enum { TV, DVD };

enum { USUAL, EXCHANGE };

Tv(int s = Off, int mc = 125) :state(s), volume(5),

maxchannel(mc), channel(2), mode(Cable), input(TV){}

~Tv(){}

voidonoff(){ state = (state == On) ? Off : On; }

boolison()const{ return state == On; }

boolvolup();

boolvoldown();

voidchanup();

voidchandown();

voidset\_mode(){ mode = (mode == Antenna) ? Cable : Antenna; }

voidset\_input(){ input = (input == TV) ? DVD : TV; }

void settings()const;

voidset\_rmode(Remote &r);

private:

int state;

int volume;

intmaxchannel;

int channel;

int mode;

int input;

};

class Remote

{

private:

friend class Tv;

enum { USUAL, EXCHANGE };

int mode;

intfmode;

public:

Remote(int m = Tv::TV, int f = USUAL) :mode(m), fmode(f){}

boolvolup(Tv&t){ return t.volup(); }

boolvoldown(Tv&t){ return t.voldown(); }

voidonoff(Tv&t){ t.onoff(); }

voidchanup(Tv&t){ t.chanup(); }

voidchandown(Tv&t){ t.chandown(); }

voidset\_chan(Tv&t, int c){ t.channel = c; }

voidset\_mode(Tv&t){ t.set\_mode(); }

voidset\_input(Tv&t){ t.set\_input(); }

voidmode\_show()const{ cout<< "Remote pretent mode is " <<fmode<<endl; }

};

inline void Tv::set\_rmode(Remote &r)

{

if (ison())

{

r.fmode = Remote::EXCHANGE;

r.mode\_show();

}

}

#endif

//tvfm.h

#ifndef TVFM\_H\_

#define TVFM\_H\_

#include <iostream>

using namespace std;

classTv;

class Remote

{

public:

enum State{ Off, On };

enum { MinVal, MaxVal = 20 };

enum { Antenna, Cable };

enum { TV, DVD };

private:

int mode;

public:

Remote(int m = TV) :mode(m){}

boolvolup(Tv&t);

boolvoldown(Tv&t);

voidonoff(Tv&t);

voidchanup(Tv&t);

voidchandown(Tv&t);

voidset\_chan(Tv&t, int c);

voidset\_mode(Tv&t);

voidset\_input(Tv&t);

};

classTv

{

public:

friend void Remote::set\_chan(Tv&t, int c);

enum State{ Off, On };

enum { MinVal, MaxVal = 20 };

enum { Antenna, Cable };

enum { TV, DVD };

Tv(int s = Off, int mc = 125) :state(s), volume(5),

maxchannel(mc), channel(2), mode(Cable), input(TV){}

~Tv(){}

voidonoff(){ state = (state == On) ? Off : On; }

boolison()const{ return state == On; }

boolvolup();

boolvoldown();

voidchanup();

voidchandown();

voidset\_mode(){ mode = (mode == Antenna) ? Cable : Antenna; }

voidset\_input(){ input = (input == TV) ? DVD : TV; }

void settings()const;

private:

int state;

int volume;

intmaxchannel;

int channel;

int mode;

int input;

};

inlinebool Remote::volup(Tv&t){ return t.volup(); }

inlinebool Remote::voldown(Tv&t){ return t.voldown(); }

inline void Remote::onoff(Tv&t){ t.onoff(); }

inline void Remote::chanup(Tv&t){ t.chanup(); }

inline void Remote::chandown(Tv&t){ t.chandown(); }

inline void Remote::set\_chan(Tv&t, int c){ t.channel = c; }

inline void Remote::set\_mode(Tv&t){ t.set\_mode(); }

inline void Remote::set\_input(Tv&t){ t.set\_input(); }

#endif

//tv.cpp

#include "tv.h"

//#include "tvfm.h"

boolTv::volup()

{

if (volume <MaxVal)

{

volume++;

return true;

}

else

return false;

}

boolTv::voldown()

{

if (volume>MinVal)

{

volume--;

return true;

}

else

return false;

}

voidTv::chanup()

{

if (channel <maxchannel)

channel++;

else

channel = 1;

}

voidTv::chandown()

{

if (channel>1)

channel--;

else

channel = maxchannel;

}

voidTv::settings()const

{

cout<< "TV is " << (state == Off ? "Off" : "On") <<endl;

if (state == On)

{

cout<< "Volume setting = " << volume <<endl;

cout<< "Channel setting = " << channel <<endl;

cout<< "Mode = " << (mode == Antenna ? "antenna" : "cable") <<endl;

cout<< "Input = " << (input == TV ? "TV" : "DVD") <<endl;

}

}

//use\_tv.cpp

#include "tv.h"

int main()

{

Tv s42;

Remote grey;

grey.mode\_show();

cout<< "Initial settings for 42\" TV:\n";

s42.settings();

s42.onoff();

s42.chanup();

cout<< "\nAdjusted settings for 42\" TV:\n";

s42.settings();

s42.set\_rmode(grey);

grey.set\_chan(s42, 10);

grey.volup(s42);

grey.volup(s42);

cout<< "\n42\" settings after using remote:\n";

s42.settings();

Tvs58(Tv::On);

s58.set\_mode();

grey.set\_chan(s58, 28);

cout<< "\n58\" settings:\n";

s58.settings();

s58.set\_rmode(grey);

system("pause");

return 0;

}

2、

//exc\_mean.h

#ifndef EXC\_MEAN\_H\_

#define EXC\_MEAN\_H\_

#include <iostream>

#include <cmath>

#include <stdexcept>

#include <string>

using namespace std;

classbad\_hmean :public logic\_error

{

private:

string name;

public:

explicitbad\_hmean(const string &n = "hmean", const string &s = "Error in hmean()\n");

stringmesg();

virtual ~bad\_hmean()throw(){}

};

bad\_hmean::bad\_hmean(const string &n, const string &s) :name(n), logic\_error(s)

{

}

inline string bad\_hmean::mesg()

{

return "hmean() arguments a=-b should be div a+b=0!\n";

}

classbad\_gmean :public logic\_error

{

private:

string name;

public:

explicitbad\_gmean(const string &n = "gmean", const string &s = "Error in gmean()\n");

stringmesg();

virtual ~bad\_gmean()throw(){}

};

bad\_gmean::bad\_gmean(const string &n, const string &s) :name(n), logic\_error(s)

{

}

inline string bad\_gmean::mesg()

{

return "gmean() arguments should be >= 0\n";

}

#endif

//error.cpp

#include "exc\_mean.h"

doublehmean(double a, double b);

doublegmean(double a, double b);

int main()

{

double x, y, z;

cout<< "Enter two numbers:";

while (cin>> x >> y)

{

try{

z = hmean(x, y);

cout<< "Harmonic mean of " << x << " and " << y

<<" is " << z <<endl;

cout<< "Geomettric mean of " << x << " and " << y

<<" is " <<gmean(x, y) <<endl;

cout<< "Enter next set of numbers <q to quit>: ";

}

catch (bad\_hmean&bg)

{

cout<<bg.what();

cout<< "Error message: \n" <<bg.mesg() <<endl;

cout<< "Try again.\n";

continue;

}

catch (bad\_gmean&hg)

{

cout<<hg.what();

cout<< "Error message: \n" <<hg.mesg() <<endl;

cout<< "Sorry, you don't get to play and more.\n";

break;

}

}

cout<< "Bye!\n";

system("pause");

return 0;

}

doublehmean(double a, double b)

{

if (a == -b)

throwbad\_hmean();

return 2.0\*a\*b / (a + b);

}

doublegmean(double a, double b)

{

if (a < 0 || b < 0)

throwbad\_gmean();

returnsqrt(a\*b);

}

3、

//exc\_mean.h

#ifndef EXC\_MEAN\_H\_

#define EXC\_MEAN\_H\_

#include <iostream>

#include <cmath>

#include <stdexcept>

#include <string>

using namespace std;

classbad\_hmean :public logic\_error

{

private:

string name;

public:

double v1;

double v2;

explicitbad\_hmean(double a = 0, double b = 0,

const string &s = "Error in hmean()\n");

voidmesg();

virtual ~bad\_hmean()throw(){}

};

bad\_hmean::bad\_hmean(double a, double b, const string &s)

:v1(a), v2(b), logic\_error(s)

{

name = "hmean";

}

inline void bad\_hmean::mesg()

{

cout<< name << "(" << v1 << ", " << v2

<< ") arguments a=-b should be div a+b=0!\n";

}

classbad\_gmean :public bad\_hmean

{

private:

string name;

public:

explicitbad\_gmean(double a = 0, double b = 0,

const string &s = "Error in gmean()\n");

voidmesg();

virtual ~bad\_gmean()throw(){}

};

bad\_gmean::bad\_gmean(double a, double b, const string &s)

:bad\_hmean(a, b, s)

{

name = "gmean";

}

inline void bad\_gmean::mesg()

{

cout<< name << "(" <<bad\_hmean::v1 << ", " <<bad\_hmean::v2 << ") arguments should

be >= 0\n";

}

#endif

//error.cpp

#include "exc\_mean.h"

doublehmean(double a, double b);

doublegmean(double a, double b);

int main()

{

double x, y, z;

cout<< "Enter two numbers:";

while (cin>> x >> y)

{

try{

z = hmean(x, y);

cout<< "Harmonic mean of " << x << " and " << y

<<" is " << z <<endl;

cout<< "Geomettric mean of " << x << " and " << y

<<" is " <<gmean(x, y) <<endl;

cout<< "Enter next set of numbers <q to quit>: ";

}

catch (bad\_gmean&hg)

{

cout<<hg.what();

cout<< "Error message: \n";

hg.mesg();

cout<<endl;

cout<< "Sorry, you don't get to play and more.\n";

break;

}

catch (bad\_hmean&bg)

{

cout<<bg.what();

cout<< "Error message: \n";

bg.mesg();

cout<<endl;

cout<< "Try again.\n";

continue;

}

}

cout<< "Bye!\n";

system("pause");

return 0;

}

doublehmean(double a, double b)

{

if (a == -b)

throwbad\_hmean();

return 2.0\*a\*b / (a + b);

}

doublegmean(double a, double b)

{

if (a < 0 || b < 0)

throwbad\_gmean();

returnsqrt(a\*b);

}

4、

//sales.h

#ifndef SALES\_H\_

#define SALES\_H\_

#include <stdexcept>

#include <string>

#include <cstring>

#include <iostream>

#include <cstdlib>

using namespace std;

class Sales

{

public:

enum { MONTHS = 12 };

classbad\_index:publiclogic\_error

{

private:

int bi;

public:

explicitbad\_index(int ix, const string &s = "Index error in Sales object\n");

intbi\_val()const { return bi; }

virtual ~bad\_index()throw(){}

};

explicit Sales(intyy = 0);

Sales(intyy, const double \*gr, int n);

virtual ~Sales(){}

int Year()const { return year; }

virtual double operator[](inti)const;

virtual double &operator[](inti);

private:

double gross[MONTHS];

int year;

};

classLabeledSales :public Sales

{

public:

classnbad\_index :public Sales::bad\_index

{

private:

std::stringlbl;

public:

nbad\_index(const string &lb, int ix,

const string &s = "Index error in LabeledSales object\n");

const string &label\_val()const { return lbl; }

virtual ~nbad\_index()throw(){}

};

explicitLabeledSales(const string &lb = "none", intyy = 0);

LabeledSales(const string &lb, intyy, const double \*gr, int n);

virtual ~LabeledSales(){}

const string &Label()const { return label; }

virtual double operator[](inti)const;

virtual double &operator[](inti);

private:

string label;

};

#endif

//sales.cpp

#include "sales.h"

Sales::bad\_index::bad\_index(int ix,

const string &s) :logic\_error(s), bi(ix)

{

}

Sales::Sales(intyy)

{

year = yy;

for (inti = 0; i< MONTHS; ++i)

gross[i] = 0;

}

Sales::Sales(intyy, const double \*gr, int n)

{

year = yy;

intlim = (n < MONTHS) ? n : MONTHS;

inti;

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

gross[i] = gr[i];

for (; i< MONTHS; ++i)

gross[i] = 0;

}

double Sales::operator[](inti)const

{

if (i< 0 || i>= MONTHS)

throwbad\_index(i);

return gross[i];

}

double&Sales::operator[](inti)

{

if (i< 0 || i>= MONTHS)

throwbad\_index(i);

return gross[i];

}

LabeledSales::nbad\_index::nbad\_index(const string &lb, int ix,

const string &s) :Sales::bad\_index(ix, s)

{

lbl = lb;

}

LabeledSales::LabeledSales(const string &lb, intyy) : Sales(yy)

{

label = lb;

}

LabeledSales::LabeledSales(const string &lb, intyy, const double \*gr, int n) : Sales(yy, gr, n)

{

label = lb;

}

doubleLabeledSales::operator[](inti)const

{

if (i< 0 || i>= MONTHS)

thrownbad\_index(Label(), i);

return Sales::operator[](i);

}

double&LabeledSales::operator[](inti)

{

if (i< 0 || i>= MONTHS)

thrownbad\_index(Label(), i);

return Sales::operator[](i);

}

//use\_sales.cpp

#include "sales.h"

int main()

{

double vals1[12] =

{

1220, 1100, 1122, 2212, 1232, 2334,

2884, 2393, 3302, 2922, 3002, 3544

};

double vals2[12] =

{

12, 11, 22, 21, 32, 24,

28, 29, 33, 29, 32, 35

};

Sales sales1(2011, vals1, 12);

LabeledSalessales2("Blogstar", 2012, vals2, 12);

Sales::bad\_index \*s;

LabeledSales::nbad\_index \*l;

cout<< "First try block:\n";

try

{

inti;

cout<< "Year = " << sales1.Year() <<endl;

for (i = 0; i< 12; ++i)

{

cout<< sales1[i] << ' ';

if (i % 6 == 5)

cout<<endl;

}

cout<< "Year = " << sales2.Year() <<endl;

cout<< "Label = " << sales2.Label() <<endl;

for (i = 0; i<= 12; ++i)

{

cout<< sales2[i] << ' ';

if (i % 6 == 5)

cout<<endl;

}

cout<< "End of try block 1.\n";

}

catch (logic\_error&bad)

{

cout<<bad.what();

if (l = dynamic\_cast<LabeledSales::nbad\_index \*>(&bad))

{

cout<< "Comany: " << l->label\_val() <<endl;

cout<< "bad index: " << l->bi\_val() <<endl;

}

else if (s = dynamic\_cast<Sales::bad\_index \*>(&bad))

cout<< "bad index: " << s->bi\_val() <<endl;

}

cout<< "\nNext try block:\n";

try

{

sales2[2] = 37.5;

sales1[20] = 23345;

cout<< "End of try block 2.\n";

}

catch (logic\_error&bad)

{

cout<<bad.what();

if (l = dynamic\_cast<LabeledSales::nbad\_index \*>(&bad))

{

cout<< "Comany: " << l->label\_val() <<endl;

cout<< "bad index: " << l->bi\_val() <<endl;

}

else if (s = dynamic\_cast<Sales::bad\_index \*>(&bad))

cout<< "bad index: " << s->bi\_val() <<endl;

}

cout<< "done\n";

system("pause");

return 0;

}

**Chapter 16**

PE 16-1

// pe16-1.cpp -- one of many possible solutions

#include <iostream>

#include <string>

bool isPal(const std::string & s);

int main()

{

std::string input;

std::cout << "Enter a string (empty string to quit):\n";

std::getline(std::cin,input);

while (std::cin && input.size() > 0)

{

if (isPal(input))

std::cout << "That was a palindrome!\n";

else

std::cout << "That was not a palindrome!\n";

std::cout << "Enter a string (empty string to quit):\n";

std::getline(std::cin,input);

} std::cout << "

Bye!\n";

return 0;

}

bool isPal(const std::string & s)

{

std::string rev(s.rbegin(), s.rend()); // construct reversed

string

// some older compilers don’t implement the above constructor

// another approach is this

// std::string rev(s); // rev same size as s

// copy(s.rbegin(), s.rend(), rev.begin());

return (rev == s);

}

PE 16-4

// pe16-4.cpp -- one possibility

#include <iostream>

#include <algorithm>

#define MAX 10

int reduce(long ar[], int n);

void show(const long ar[], int n);

int main()

{

long myarray[MAX] = {12, 12 ,5, 6, 11, 5, 6, 77, 11,12};

show(myarray, MAX);

int newsize = reduce(myarray,MAX);

show(myarray, newsize);

return (0);

}

int reduce(long ar[], int n)

{

// or one could copy to a list and use list methods

// or copy to a set; in either case, copy results

// back to array

std::sort(ar, ar + n);

long \* past\_end;

past\_end = std::unique(ar, ar + n);

return past\_end - ar;

}

void show(const long ar[], int n)

{

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

std::cout << ar[i] << ' ';

std::cout << std::endl;

}

PE 16-8

// pe16-8.cpp

#include <iostream>

#include <set>

#include <algorithm>

#include <iterator>

#include <cstdlib>

#include <string>

int main()

{

using namespace std;

string temp;

set<string> mats;

cout << "Enter Mat's guest list (empty line to quit):\n";

while (getline(cin,temp) && temp.size() > 0)

mats.insert(temp);

ostream\_iterator<string,char> out (cout, "\n");

cout << "Mat's guest list:\n";

copy(mats.begin(), mats.end(), out);

set<string> pats;

cout << "Enter Pat's guest list (empty line to quit):\n";

while (getline(cin,temp) && temp.size() > 0)

pats.insert(temp);

cout << "\nPat's guest list:\n";

copy(pats.begin(), pats.end(), out);

set<string> both;

set\_union(mats.begin(), mats.end(), pats.begin(),

pats.end(),

insert\_iterator<set<string> >(both, both.begin()));

cout << "\nMerged guest list:\n";

copy(both.begin(), both.end(), out);

return 0;

}

**Chapter 17**

PE 17-1

// pe17-1.cpp

#include <iostream>

int main(void)

{

using namespace std;

char ch;

int count = 0;

while (cin.get(ch) && ch != '$')

count++;

if (ch == '$')

cin.putback(ch);

else

cout << "End of input was reached\n";

cout << count << " characters read\n";

cin.get(ch);

cout << "Then next input character is " << ch << endl;

return 0;

}

PE 17-3

// pe17-3.cpp

#include <iostream>

#include <fstream>

#include <cstdlib>

int main(int argc, char \* argv[])

{

using namespace std;

if (argc < 3)

{

cerr << "Usage: " << argv[0]

<< " source-file target-file\n";

exit(EXIT\_FAILURE);

} ifstream fin(argv[1]);

if (!fin)

{

cerr << "Can't open " << argv[1] << " for input\n";

exit(EXIT\_FAILURE);

} ofstream fout(argv[2]);

if (!fout)

{

cerr << "Can't open " << argv[2] << " for output\n";

exit(EXIT\_FAILURE);

}

char ch;

while (fin.get(ch))

fout << ch;

cout << "Contents of " << argv[1] << " copied to "

<< argv[2] << endl;

fin.close();

fout.close();

return 0;

}

PE 17-5

// pe17-5.cpp

#include <iostream>

#include <fstream>

#include <set>

#include <algorithm>

#include <iterator>

#include <cstdlib>

#include <string>

int main()

{

using namespace std;

ifstream mat("mat.dat");

if (!mat.is\_open())

{

cerr << "Can't open mat.dat.\n";

exit(1);

} ifstream pat("pat.dat");

if (!pat.is\_open())

{

cerr << "Can't open pat.dat.\n";

exit(1);

}

ofstream matnpat("matnpat.dat");

if (!matnpat.is\_open())

{

cerr << "Can't open pat.dat.\n";

exit(1);

}

string temp;

set<string> mats;

while (getline(mat,temp))

mats.insert(temp);

ostream\_iterator<string,char> out (cout, "\n");

cout << "Mat's guest list:\n";

copy(mats.begin(), mats.end(), out);

set<string> pats;

while (getline(pat,temp))

pats.insert(temp);

cout << "\nPat's guest list:\n";

copy(pats.begin(), pats.end(), out);

ostream\_iterator<string,char> fout (matnpat, "\n");

set<string> both;

set\_union(mats.begin(), mats.end(), pats.begin(),

pats.end(),

insert\_iterator<set<string> >(both, both.begin()));

cout << "\nMerged guest list:\n";

copy(both.begin(), both.end(), out);

copy(both.begin(), both.end(), fout);

return 0;

}

if (!pat.is\_open())

{

cerr << "Can't open pat.dat.\n";

exit(1);

}

ofstream matnpat("matnpat.dat");

if (!matnpat.is\_open())

{

cerr << "Can't open pat.dat.\n";

exit(1);

}

string temp;

set<string> mats;

while (getline(mat,temp))

mats.insert(temp);

ostream\_iterator<string,char> out (cout, "\n");

cout << "Mat's guest list:\n";

copy(mats.begin(), mats.end(), out);

set<string> pats;

while (getline(pat,temp))

pats.insert(temp);

cout << "\nPat's guest list:\n";

copy(pats.begin(), pats.end(), out);

ostream\_iterator<string,char> fout (matnpat, "\n");

set<string> both;

set\_union(mats.begin(), mats.end(), pats.begin(),

pats.end(),

insert\_iterator<set<string> >(both, both.begin()));

cout << "\nMerged guest list:\n";

copy(both.begin(), both.end(), out);

copy(both.begin(), both.end(), fout);

return 0;

}

PE 17-7

// pe17-7.cpp

#include <iostream>

#include <fstream>

#include <string>

#include <vector>

#include <algorithm>

#include <cstdlib>

void ShowStr(const std::string & s);

void GetStrs(std::istream & is, std::vector<std::string> & vs);

class Store

{

public:

std::ostream & os;

Store (std::ostream & o) : os(o) {}

void operator()(const std::string &s);

};

int main()

{

using namespace std;

vector<string> vostr;

string temp;

// acquire strings

cout << "Enter strings (empty line to quit):\n";

while (getline(cin,temp) && temp[0] != '\0')

vostr.push\_back(temp);

cout << "Here is your input.\n";

for\_each(vostr.begin(), vostr.end(), ShowStr);

// store in a file

ofstream fout("strings.dat", ios\_base::out |

ios\_base::binary);

for\_each(vostr.begin(), vostr.end(), Store(fout));

fout.close();

// recover file contents

vector<string> vistr;

ifstream fin("strings.dat", ios\_base::in | ios\_base::binary);

if (!fin.is\_open())

{

cerr << "Could not open file for input.\n";

exit(EXIT\_FAILURE);

} GetStrs(fin, vistr);

cout << "\nHere are the strings read from the file:\n";

for\_each(vistr.begin(), vistr.end(), ShowStr);

return 0;

}

void ShowStr(const std::string & s)

{

std::cout << s << std::endl;

}

void Store::operator()(const std::string &s)

{

std::size\_t len = s.size();

os.write((char \*)&len, sizeof(std::size\_t));

os.write(s.data(), len);

}

void GetStrs(std::istream & is, std::vector<std::string> & vs)

{

std::string temp;

size\_t len;

while (is.read((char \*) &len, sizeof(size\_t)) && len > 0)

{

char ch;

temp = "";

for (int j = 0; j < len; j++)

{

if (is.read(&ch, 1))

{

temp += ch;

} else

break;

} if (

is)

vs.push\_back(temp);

}

}