Research Project 1: Student

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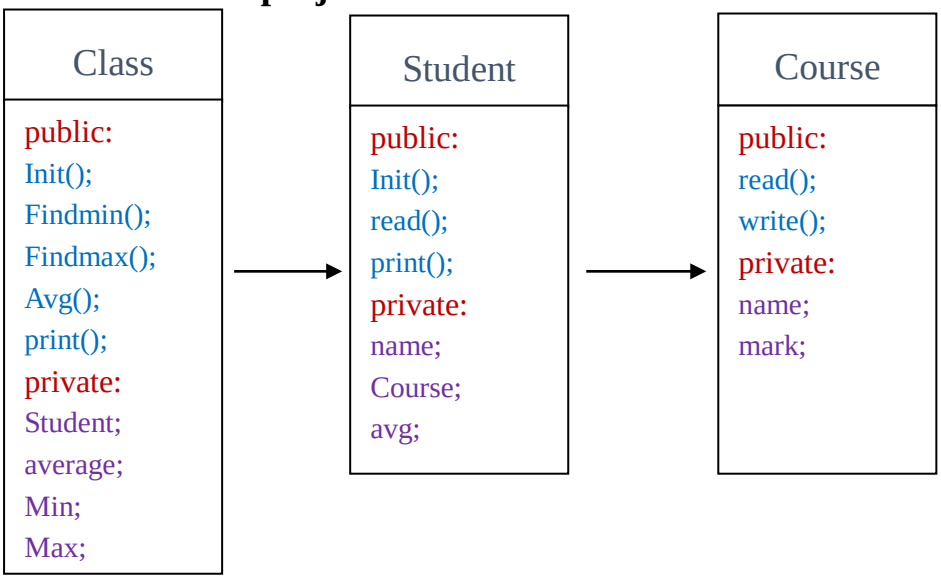
Chapter 1: Introduction

Write a program that asks you 10 records of students. Each record consists of a name (w/o space), and scores for three courses (in integer, 1 to 5). Output a list as the next page and calculate average score (in float) of each student and each course. Output the lowest and highest score for each course.

Chapter 2: Coding Specification

I. Class in this project:



II. Source Code

(1) Course.h

```
#ifndef __COURSE_H__
#define __COURSE_H__

class Course{
public:
  double read(); /*read and return the mark of this course*/
  void write();  /*write the mark in the object*/
private:
  char name[8];  /*name of the course*/
  double mark;   /*mark of the course*/
};

#endif
```

(2) Course.cpp

```
#include<iostream>
#include"Course.h"

double Course::read(){ /*return rhe mark*/
  return mark;
}

void Course::write(){ /*read from the input and write it to mark*/
  std::cin>>mark;
}
```

(3) Student.h

```
#ifndef __STUDENT_H__
#define __STUDENT_H__
#include"Course.h"

class Student{
public:
  void Init();   /*Initialize the Student*/
  double read(int option); /*read and return the students mark of one
                             course*/
  void print(); /*print the student's information*/
private:
  char name[10];
  Course C[5];
  double avg;  /*the student's average mark*/
};

#endif
```

(4) Student.cpp

```
#include<iostream>
#include<cstdio>
#include"Student.h"

double Student::read(int option){
  return C[option].read(); /*return the mark of selected course*/
}

void Student::Init() {
```

```
  int i;
  std::cin>>name;   /*write the name of the student*/
   for(i=3;i<8;i++)
     if(name[i]<'a'||name[i]>'z')
     {             /*change the name to a unified formate*/
        name[i]=' ';
        name[i+1]=0;
     }


  for(i=1;i<=3;i++)
    C[i].write();  /*write the mark of each course*/
  avg=(C[1].read()+C[2].read()+C[3].read())/3; /*calculate average*/
}

void Student::print() { /*print the student's information*/
  printf("%s", name);
  std::cout<<C[1].read()<<"                          "<<C[2].read()<<"
"<<C[3].read()<<"      "<<avg<<std::endl;
}
```

(5) Class.h

```
#ifndef __CLASS_H__
#define __CLASS_H__
#include"Student.h"

class Class{
public:
  void print();  /*Print the mark of all the student in the class
                   and the max, min and average of each course*/

  void Init();   /*Initialize the class*/
  void Findmin(); /*Find the minimum mark of each subject*/
  void Findmax(); /*Find the maximum mark of each subject*/
  void Avg();    /*calculate the average of each subject*/
private:
  Student S[10];  /*In a class there are 10 students*/
  double average[4]; /*the average of each subject*/
  double Min[4];  /*the minimum mark of each subject*/
  double Max[4];  /*the maximum mark of each subject*/
};

#endif
```

(6) Class.cpp

```
#include<iostream>
#include<cstdio>
#include"Class.h"

void Class::Init(){

  int i;
  for(i=0;i<10;i++)   /*initialize every student in the class*/
     S[i].Init();

}
void Class::Findmin(){
 int temp;
 int i;
 int j;

 for(j=1;j<4;j++)
 {
   temp=S[0].read(j);  /*Find the minimum mark of each course*/
   for(i=1;i<10;i++)
    if(S[i].read(j)<temp)
       temp=S[i].read(j);
   Min[j]=temp;      /*store it*/
 }
}

void Class::Findmax(){

   int i;
   int j;
   int temp;

    for(j=1;j<=3;j++)
    {
     temp=S[0].read(j);  /*Find the minimum mark of each course*/
     for(i=0;i<10;i++)
      if(S[i].read(j)>temp)
        temp=S[i].read(j);
     Max[j]=temp;       /*store it*/
    }
}
```

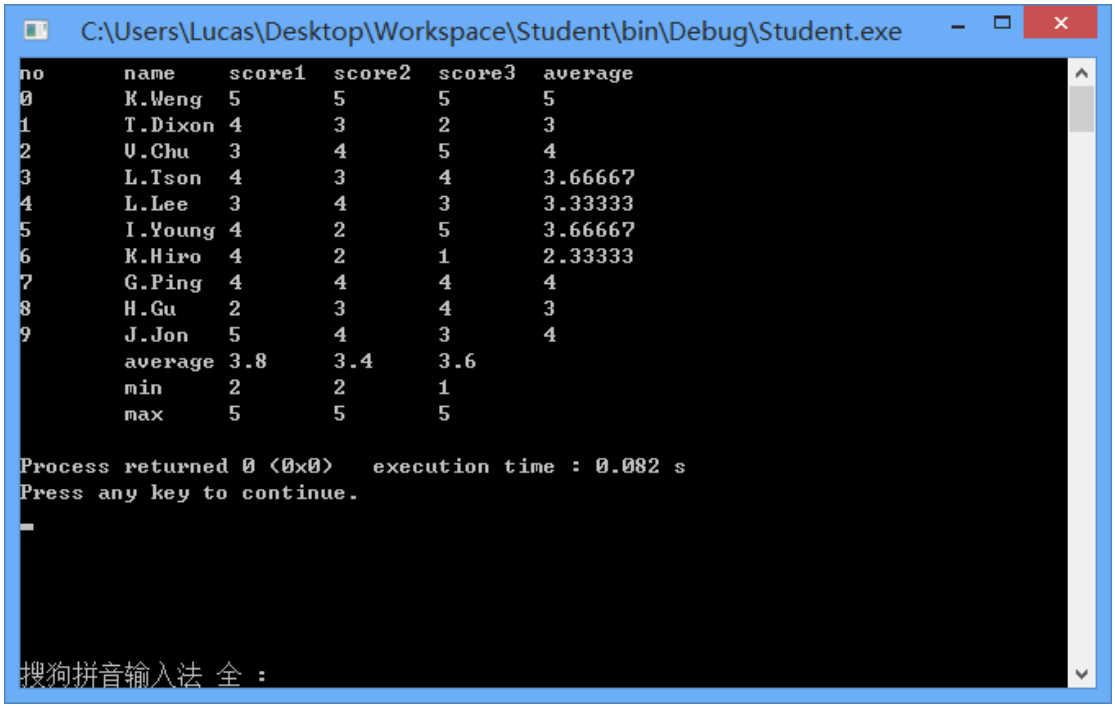
```
void Class::Avg(){
   int i;
   int j;
   double temp;

   for(j=1;j<=3;j++)    /*Find the minimum mark of each course*/
   {
    temp=0;
    for(i=0;i<10;i++)
     temp+=S[i].read(j);
    average[j]=temp/10;   /*store it*/
   }
}

void Class::print() {   /*print the class according to the format*/
   int i;
   std::cout<<"no             name         score1    score2    score3
average"<<std::endl;
   for(i=0;i<10;i++)
   {
      printf("%d      ",i);
      S[i].print();
   }
   std::cout<<"         average "<<average[1]<<"     "<<average[2]<<"
"<<average[3]<<std::endl;
   std::cout<<"           min       "<<Min[1]<<"         "<<Min[2]<<"
"<<Min[3]<<std::endl;
   std::cout<<"           max       "<<Max[1]<<"         "<<Max[2]<<"
"<<Max[3]<<std::endl;
}
```

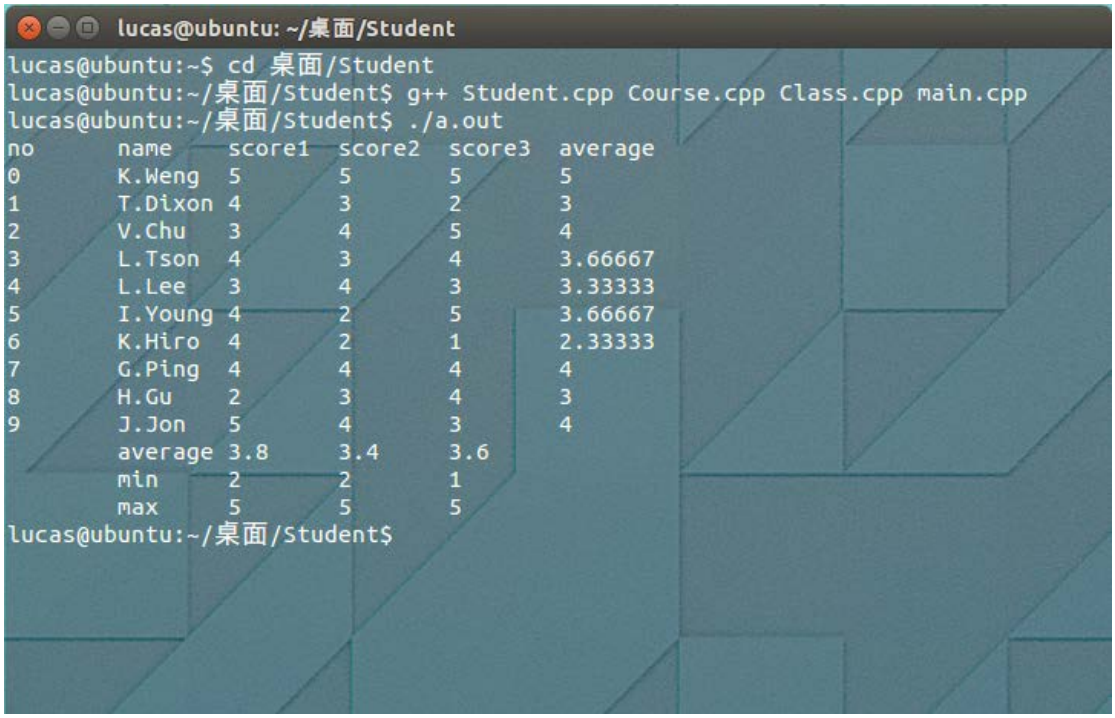
(7) main.cpp

```
#include<iostream>
#include<cstdio>
#include<cstdlib>
#include"Class.h"

using namespace std;

int main()
{
  //if(freopen("1.in","r",stdin)==NULL)
```

```
    //exit(0);
  Class C;
  C.Init(); /*initialize the class first*/
  C.Avg();  /*calculate the min max and average*/
  C.Findmax();
  C.Findmin();
  C.print(); /*print the class*/
}
```

Chapter 3: Testing Results





Declaration

We hereby declare that all the work done in this project titled "World's Richest" is of my independent effort.