

Analysis:

Understand the Problem

find out input and output

Process complete problem statement

Design:

Develop algorithm

Structure diagram

Pseudo code

Problem Statement

Write a program that reads students name followed by their test scores. The problem should output each student's name followed by the test scores and relevant grade. It should also find and print the highest test score and the name of the students having the highest test score.

student data should be stored in a class variable of type Student . Which has four component

first_name of type string

last_name of type string

test_score of type int

grade of type char

Letter Grading Scheme

$\text{score} \geq 90$ - 'A'

$80 \leq \text{score} < 90$ - 'B'

$70 \leq \text{score} < 80$ - 'C'

$50 \leq \text{score} < 70$ - 'D'

$\text{score} < 50$ - 'F'

Student names and marks

Tony Stark 82

Black Panther 43

Brie Larson 75

Chris Evans 99
Chris Hemsworth 39
Chris Pratt 83
Scarlett Johanson 84
Mark Ruffalo 72
Tom Hiddleston 96
Jeremy Renner 53
Sydney Crosby 87
Carey Price 31
Heinz Ketchup 57
Ryan Reynolds 100
Mike Rotchburns 13
Nathan MacKinnon 29
Connor McDavid 97
Carrie Fisher 60
Mark Hamill 70
Natalie Portman 40

Output:

All student grades.

Stark, Tony 82 B
Panther, Black 43 F
Larson, Brie 75 C
Evans, Chris 99 A
Hemsworth, Chris 39 F
Pratt, Chris 83 B
Johanson, Scarlett 84 B
Ruffalo, Mark 72 C

Hiddleston, Tom 96 A

Renner, Jeremy 53 D

Crosby, Sydney 87 B

Price, Carey 31 F

Ketchup, Heinz 57 D

Renolds, Ryan 100 A

Rotchburns, Mike 13 F

MacKinnon, Nathan 29 F

McDavid, Connor 97 A

Fisher, Carrie 60 D

Hamill, Mark 70 C

Portman, Natalie 40 F

Heighest score grade student.

Evans, Chris 99 A

Hiddleston, Tom 96 A

Renolds, Ryan 100 A

McDavid, Connor 97 A

Process complete problem statement

A Class for instance variable.

A class for defining all methods.

A function to read the student's data into the array.

A function to assign the relavant grade to each student.

A function to find the heighest test score.

A function to print the name of the students having the highest test score

A main function for creating class object and calling class methods.

Algorithm

step 1:

create a student class with instance variable fname,lname,marks , grades

step 2:

create a grades

method 1: ReadStudentData()

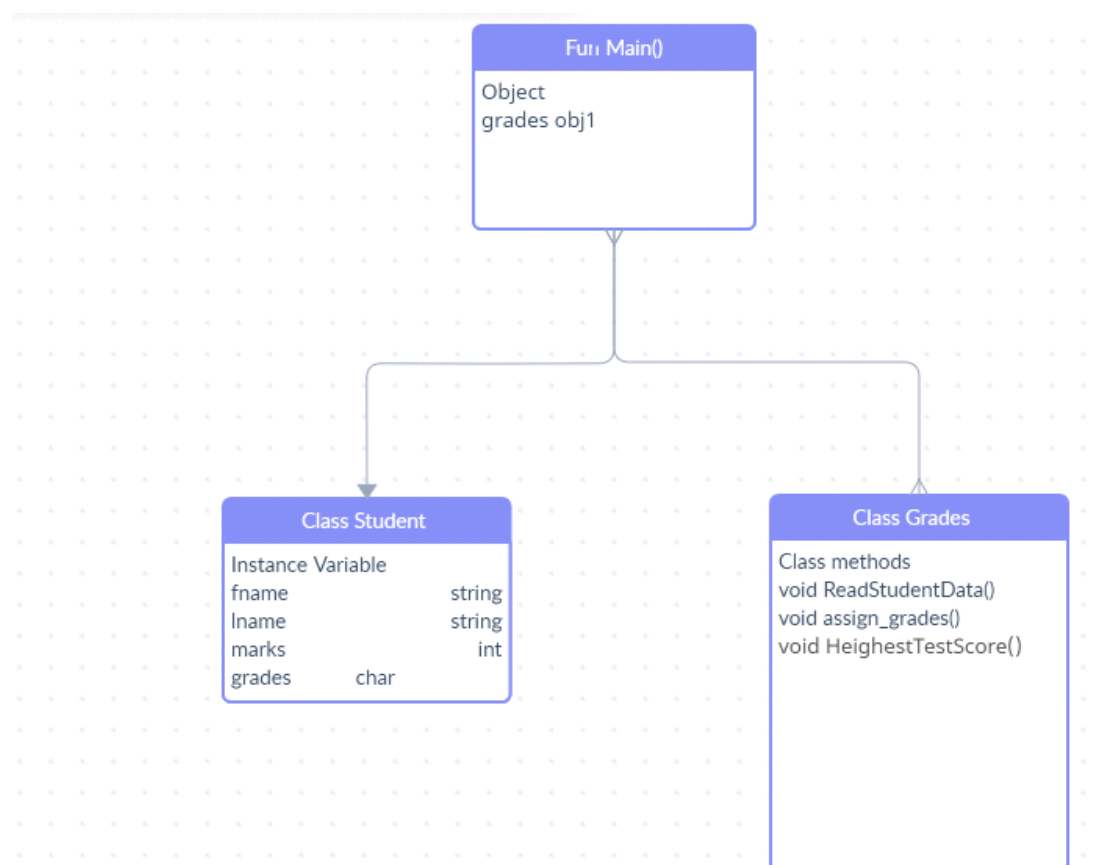
method 2: assign_grades()

method 3: HeighestTestScore()

step 3:

create main function and in this function create object of grades class.

Structure diagram



Pseudo code

class student

```

{ public :
fname,lname,marks , grades;
}

class grades{
    public:
ReadStudentData()
{
    ifstream indata;

    student s[20];

    indata.open("student_data 2.txt");

    if(!indata) {
print(Error: file could not be opened) }

    i=1;

    indata( s[0].fname,s[0].lname,s[0].marks)

    while ( !indata.eof() ) {

        indata (s[i].fname,s[i].lname,s[i].marks)

        i++;

    }

    indata.close();

    assign_grades(s,i);

    HeighestTestScore(s,i);

    n=i;

    print(All student grades)

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

    {

        print(s[i].lname,[i].fname,s[i].marks,s[i].grades)

    }
}

```

```

}
assign_grades(student *s, n)
{
for(i=0;i<n;i++)
{
if(s[i].marks>=90)
s[i].grades='A'
else if(s[i].marks<90 && s[i].marks>=80)
s[i].grades='B'
else if(s[i].marks<80 && s[i].marks>=70)
s[i].grades='C'
else if(s[i].marks<70 && s[i].marks>=50)
s[i].grades='D'
else if(s[i].marks<90 )
s[i].grades='F'
}
}
HeighestTestScore(student *s, n){
max=0;
print(Heighest score grade student)
for( i=0;i<n;i++)
{
if(s[i].grades=='A')
print( s[i].lname,s[i].fname,s[i].marks,s[i].grades )
}
}
}

```

```
main()
{ grades x
  x.ReadStudentData()
  return }
```