Software Design and Development

Project Brief

**Project Brief:**

Your overall percentage grade in your SCQF level 6 Computing Science Course is devised by adding the coursework mark (out of 60) to the prelim mark (out of 90) and then calculating the percentage.

Usually the grades are awarded by the following percentages:

A Grade is awarded for greater than or equal to 70%

B Grade is awarded to those between 60% and 69%

C Grade is awarded to those between 50% and 59%

D Grade is awarded to those between 45% and 49%

No Grade is awarded to those under 45%

Grade = ((coursework mark + prelim mark) \*100) / 150

Your task is to design, implement and test a program by completing the following tasks:

**Task 1:**

* Write an algorithm using an appropriate design notation which will input one student’s coursework mark and prelim mark and calculate and display their percentage and grade.

Remember to show the data flow and ensure that the input is validated.

**Task 2:**

* Create your own test plan for the program which will systematically test that the program works.

Remember to include normal, extreme and exceptional test data.

**Task 3 & 4:**

* Write a program based on your design.
* You should be using subprograms and parameter passing within the program.

Remember to use meaningful variable names, internal commentary and indentation.

* Use internal commentary to explain the purpose of using subprograms and parameter passing and how they work.

**Task 5:**

* Test the program using your test plan.

If necessary, make any amendments to your program.

**Task 6:**

Your program only works for one candidate at present.

* Alter your program so that it will read the name, coursework mark and prelim mark for all the 15 students in your class from an external file (available from your assessor).

Make sure that you add internal commentary to explain how the file operation works and its purpose.

**Task 7:**

* Alter your program to enable it to find out how many “A” passes are in the class by using the “Count Occurrences” standard algorithm.

Use internal commentary to describe how the “Count Occurrences” algorithm works.

* Alter your program to find out who has the best percentage in the class by using the “Find Max” standard algorithm.

Use internal commentary to describe how the “Finding Max” algorithm works.

**Step 8:**

Explain how the computer processes the program using the fetch-execute cycle with reference to processor, memory and buses.

**Name.txt :**

**Duncan**

**Grant**

**Alistair**

**Fergus**

**Ivor**

**Isobel**

**Moyra**

**Kirstin**

**Shona**

**Beitris**

**Ainsley**

**Islay**

**Allan**

**Niven**

**Katriona**

**Mark1.txt**

**59**

**33**

**55**

**10**

**47**

**60**

**57**

**45**

**20**

**39**

**55**

**25**

**23**

**30**

**54**

**Mark2.txt**

**75**

**80**

**88**

**45**

**78**

**90**

**82**

**65**

**40**

**59**

**75**

**50**

**48**

**60**

**86**