Assignment 1.1 Task 2

This is a software development and implementation task.

A class is studying for Edexcel's GCSE in Information and Communication Technology (1185) and their teacher wishes to use software to record marks and provide advice.

The teacher is able to enter detail of the pupils (class and name); the marks they have received on each process heading for each piece of coursework; and grade boundaries.

The software will use these data to indicate:

> Which pupils are predicted (on the basis of current performance) to achieve one of the following sets of grades - A-A*, B-C, D, E-G.
> Which exam tier is appropriate for each pupil.
> Which grade each pupil receives on each process heading on each piece of coursework.
> Which mark and grade each pupil receives overall for each piece of coursework.
> Which mark and grade each pupil receives for their current marks on each process heading.

The requirements for this task are listed in the table overleaf.

The purpose of this information is to allow the teacher to target help for individual pupils and to see the relative difficulty of coursework tasks and individual process headings.

The specification for the Edexcel course, gives details of the process headings used to mark coursework and the maximum mark for each. Note that in addition to the marks given for each piece of coursework, there is an additional mark given to the coursework set - for quality of written communication.

The specification can be downloaded from the link above or from:
http://www.edexcel.org.uk/edexcel/ks4updates.nsf/httpGCSE/e939d12d23fd99f580256a61003680d4/$File/ICT.pdf

What you must do:

(a) Build a software model to allow the teacher to enter data and obtain totals and predicted grades. Where invalid data is entered, appropriate error messages should be displayed.

   (i)   Print your solution and annotate to identify:
      - input data (class; pupil name; score on each process heading; maximum mark possible for each process heading; grade boundaries; grades selected for display);
      - output data (cumulative total overall and for each process heading, predicted grade, exam tier, pupils in each grade set);
      - formulae used.

   (ii) Print out evidence of any error messages produced.

(b) (i)   Show three complete sets of test data, one of which must result in an error message
     (ii) Using you sets of test data, produce annotated output which shows that the expected results are achieved.

Input requirements

Data to be input	Validation
Class	Text
Name of pupil	Text
Maximum mark possible for each process heading	Integer
Pupil mark on each process heading	Integer less than or equal to maximum
Grade boundary A-A*	Integer, less than 100, greater than grade maximum for grade B-C
Grade boundary B-C	Integer, maximum less than minimum for grade A-A* and minimum greater than maximum for grade D
Grade boundary D	Integer, maximum less than minimum for grade B-C and minimum greater than maximum for grade E-G
Grade boundary E-G	Integer, minimum 0 and maximum less than minimum for grade D

Processing requirements

Processing stage	Notes and examples
Table of all marks for all pupils in a class	
Calculate total for each pupil on each piece of coursework	
Calculate the grade for each pupil on each piece of coursework	
Calculate cumulative total for each pupil on each process heading	
Calculate the grade for each pupil on each process heading	
Calculate cumulative total for each pupil on all coursework completed	
Calculate final grade for each pupil based on current marks	
Calculate the exam tier based on current performance	

Output requirements

All input data	
Cumulative totals for each pupil on each process heading and on each piece of coursework	
Estimated grade for each pupil, based on current performance	To be presented on screen with an option to print out
List of pupils predicted to be in each set of grades	
Distinguish pupils in each grade on each piece of coursework	
Distinguish pupils in each grade on each process heading	