Practical 15 January

1) Write a menu-driven program to simulate a calculator. Your program should take 2 operands as input from the user and display a menu showing the 4 basic mathematical operations (+,-,*,/). The user should be able to choose 1 option and the output of the computation should be displayed accordingly.

2) Write a program that determines a student's grade. It reads three test scores (between 0 and 100) and calculates the grade based on the following rules:

a. If the average score is 90 or more, the grade is 'A'.
b. If the average score is between 80 and 90, the program checks the third score. If the third score is more than 90, the grade is 'A'; otherwise, the grade is 'B'.
c. If the average score is between 70 and 80, the program checks the third score. If the third score is more than 80, the grade is 'B'; otherwise, the grade is 'C'.
d. If the average score is between 60 and 70, the program checks the third score. If the third score is more than 70, the grade is 'C'; otherwise, the grade is 'D'.
e. If the average score is less than 60, the program checks the third score. If the third score is more than 60, the grade is 'D'; otherwise, the grade is 'F'.

The program's main is to contain only call statements . At least three subfunctions are required: one to read scores, one to determine the grade, and one to print the results.

3) Write a program to compute the real roots of a quadratic equation ($ax^2 + bx + c = 0$) . The roots can he calculated using the following formulas:

$$x1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \quad \text{and} \quad x2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

Your program is to prompt the user to enter the constants (a,b,c). It should then display the roots based on the following rules:

a. If both a and b are zero, there is no solution.
b. If a is zero, there is only one root (-c/b).
c. If the discriminant (b^2 - 4ac) is negative, there are no real roots.
d. For all other combinations, there are two roots.

Test your program with the following data -

a	b	c
3	8	5
-6	7	8
0	9	-10
0	0	11