Module 4: Working with Modules and Handling Exceptions

Case Study I

Case Study

1. A Robot moves in a Plane starting from the origin point (0,0). The robot can move toward UP, DOWN, LEFT, RIGHT. The trace of Robot movement is as given following:

   UP 5
   DOWN 3
   LEFT 3
   RIGHT 2

(The numbers after directions are steps)

Write a program to compute the current distance from the origin point after sequencing of movements.

Hint: Use math module.

2. Data of XYZ company is stored in a sorted list. Write a program to search for specific data from that list.

   Hint: Use if/elif to deal with conditions.

3. A weather forecasting organization wants to show whether it is day or night. Write a program to find whether is it dark outside or not based on the local system time.

   Hint: Use time module.

4. Write a program to find distance between two locations when their latitude and longitudes are given.

Hint: Use math module.

5. Design a banking system software with options like cash withdraw, cash credit and change password. The software must display appropriate results based on user inputs.

   Hint: Use if else statements and functions.

6. Write a program which will find all numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included). The numbers obtained should be printed in a comma-separated sequence on a single line.

7. Write a program which can compute the factorial of a given numbers. Use recursion to find it.

8. Write a program that calculates and prints the value according to the given formula:
   Q = Square root of [(2 * C * D)/H]
   Following are the fixed values of C and H: C is 50. H is 30.
   D is the variable whose values should be input to your program in a comma-separated sequence.

   Example:

   Let us assume the following comma separated input sequence is given to the program:
   100,150,180
   The output of the program should be:
   18,22,24

9. Write a program which takes 2 digits, X, Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be i*j.
   Note: i=0,1.., X-1; j=0,1,¡-Y-1.

   Example:
   Suppose the following inputs are given to the program:
   3,5
   Then, the output of the program should be:
   [[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

10. Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.

    Suppose the following input is supplied to the program:

    without, hello, bag, world

    Then, the output should be:

    bag, hello, without, world

11. Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized.

    Suppose the following input is supplied to the program:

    - Hello world
    - Practice makes perfect

    Then, the output should be:

    - HELLO WORLD
    - PRACTICE MAKES PERFECT

12. Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

    Suppose the following input is supplied to the program:

    hello world and practice makes perfect and hello world again

    Then, the output should be:

    again and hello makes perfect practice world

13. Write a program which accepts a sequence of comma separated 4-digit binary numbers as its input and then check whether they are divisible by 5 or not. The numbers that are divisible by 5 are to be printed in a comma separated sequence.

Example:

0100,0011,1010,1001

Then the output should be:

1010

14. Write a program that accepts a sentence and calculate the number of upper-case letters and lower case letters.

    Suppose the following input is supplied to the program:

    Hello world!

    Then, the output should be:

    UPPER CASE 1

LOWER CASE 9

15. Give example of fsum and sum function of math library.