Programming Fundamentals *COURSE & LAB* – Spring 2021

(BS-IT-F20 Morning & Afternoon)

LAB- 5

1. Take three distinct integers from the user and print them in ascending (increasing) order.

2. Take the first term (***a***), common difference (***d***) and the number of terms (***n***) from the user, and display the first ***n*** terms of the arithmetic sequence. For example, if the user enters **40** as the first term (***a***), **3** as the common difference (***d***), and **6** as the number of terms (***n***), your algorithm should display the sequence: **40,43,46,49,52,55** on screen.

3. Write a program which takes a number ***n*** as input from the user. Your program should make sure that the number ***n*** is greater than or equal to 2. If ***n*** is less than 2 your program should keep asking the user again and again until the user enters a valid value.

Then, your program should ask the user to enter ***n*** integers (one by one). The program should then determine and display the **Largest** and the **Second largest** of these ***n*** values. You can assume that all the numbers provided by the user are distinct i.e. there is no repetition of values. A sample run of your program will look like this (text shown in red is entered by the user):

```
Enter the number of inputs (>=2) : -3
ERROR: Invalid input!!
Enter the number of inputs again (>=2) : 1
ERROR: Invalid input!!
Enter the number of inputs again (>=2) : 4

Enter number 1: 6
Enter number 2: 5
Enter number 3: 8
Enter number 4: 3

Largest number is: 8
Second largest number is: 5
```

4. A palindrome is a number or a text phrase that reads the same backwards as forwards. For example, each of the following five-digit integers is a palindrome: 12321, 55555, 45554 and 11611. Write a program that reads in a five-digit integer and determines whether it is a palindrome. A sample run of your program will look like this (text shown in red is entered by the user):

```
Enter a 5-digit number: 12321
12321 is a palindrome
Do you want to continue (Y/N)? Y

Enter a 5-digit number: 12345
12345 is NOT a palindrome
Do you want to continue (Y/N)? Y
```

```
Enter a 5-digit number: 11611
11611 is a palindrome
Do you want to continue (Y/N)? N

Bye Bye!!
```

5. Design an algorithm which takes a binary number (containing only 0s and 1s) from the user and print its decimal equivalent. A sample run of your program will look like this (text shown in red is entered by the user):

```
Input a binary number: 101011
The equivalent decimal number is: 43
```

6. Input a base-7 number, **digit-by-digit**, then convert it into the equivalent decimal number (base-10). Digits of the input will be entered one-by-one in order from **Least significant to Most significant**. Remember that the valid digits in base-7 are from **`0`** to **`6`**. User will enter the value **`-1`** to terminate the input taking process. The following sample run corresponds to the conversion: $(\mathbf{634})_{\mathbf{7}} = (\mathbf{319})_{\mathbf{10}}$

```
Enter a Base-7 digit: 4
Enter a Base-7 digit: 3
Enter a Base-7 digit: 6
Enter a Base-7 digit: -1

The equivalent number in Base-10 is: 319
```

7. Input a decimal number (base-10) and store its equivalent in base-9 as a **single numeric value**, and display it on screen. The following sample run corresponds to the conversion: $(\mathbf{953})_{\mathbf{10}} = (\mathbf{1268})_{\mathbf{9}}$

```
Enter a decimal (Base-10) number: 953

The equivalent number in Base-9 is: 1268
```

☺ GOOD LUCK! ☺