Data structure and Programming II

TP02:
Recursive function

- Objective:
  - To practice using recursive function
  - Apply C++ programming
- Individual work
- Submit to Moodle
  - *A pdf report (cover, exercise and solution with screenshot)*
  - *Source codes*

Deadline:
6 days

Write recursive function for each problem below.

1. Write a recursive function to find summation of all odd numbers from 1 to n, where n is the input number from user.

   1A C++ program that can perform various mathematic operations below. Solve each operation using recursive operation.

   a. A power function to calculate m^n. It is ***m*** *multiply* ***m*** for n times (m*m*...*m)

      int power(int m, int n)

   b. A function to calculate sum of square of first n integer $1^2+2^2+...+n^2$.

      int sumSquare(int n)

   c. Sum the digits of a number. Ex: 123 = 1+2+3 = 6

      int sumDigit(int n)

2. A C++ Program that can do some operations below. (make a menu for your program so that users can test any functions. Run it as infinite loop). Solve each operation using recursive operation.

   a. A function to display n star (*) **void displayStar(int n)**

   b. Display numbers from n to 1 **void displayNumbers(int n)**

3. Write a recursive function that finds and returns the minimum element in an array, where the array and its size are given as parameters.

```
int findMin(int a[ ], int n)
```

4. Write a recursive function that computes and returns the sum of all elements in an array, where the array and its size are given as parameters.

```
int findsum(int a[ ], int n)
```

5. Write a recursive program using C++ language to ask many numbers from a user (ask user to input one number then ask again and again). When the user inputs number -1, the program stops asking user for more numbers. Display total summation of all input numbers.

Example:

```
Enter number : 7
Enter number : 9
Enter number : -10
Enter number : 90
Enter number : -1
Total = 95
```