

### Lab 3

#### (Series , Patterns)

1. Write a function called check-season, it takes a month parameter and returns the season: Autumn, Winter, Spring or Summer.
2. Write a function called calculate\_slope which return the slope of a linear equation
3. Quadratic equation is calculated as follows:  $ax^2 + bx + c = 0$ . Write a function which calculates solution set of a quadratic equation, `_solve_quadratic_eqn_`.
4. Declare a function named print\_list. It takes a list as a parameter and it prints out each element of the list.
5. Declare a function named reverse\_list. It takes an array as a parameter and it returns the reverse of the array (use loops).
6. Compute the sum up to n terms in the series  
 $1 - 1/2 + 1/3 - 1/4 + 1/5 - \dots 1/n$  where n is a positive integer and input by user.
7. Write a program to compute sin x for given x. The user should supply x and a positive integer n. We compute the sine of x using the series and the computation should use all terms in the series up through the term involving  $x^n$   
 $\sin x = x - x^3/3! + x^5/5! - x^7/7! + x^9/9! - \dots$
8. Write a program to compute cosine of x. The user should supply x and a positive integer n. We compute the cosine of x using the series and the computation should use all terms in the series up through the term involving  $x^n$   
 $\cos x = 1 - x^2/2! + x^4/4! - x^6/6! + \dots$
9. Print the pattern upto N Lines:

```

      .      .      .
     /_ \    /\     /\
          /__ \    /\ 
                /___ \

```

N=2      N=3      N=4

10. Print a number as a 8 segment display N Lines:

```

  _   _   _
 | | | | |
 | | | | |
  _   _   _

```

N=2      N=3      N=4

11. Print the pattern upto N lines:

```

1 2      1 2 3      1 2 3 4
4 3      8 9 4      12 13 14 5
          7 6 5      11 16 15 6

```

10 9 8 7

N=2

N=3

N=4

12. Write a python script that displays the following table

1 1 1 1 1

2 1 2 4 8

3 1 3 9 27

4 1 4 16 64

5 1 5 25 125