

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