University of Engineering and Technology Lahore
Department of Computer Science and Engineering

Programming Fundamentals
Spring 2025

Target: (Repetition Structures II)

Problem Set 4

Single Loops

1. Write code that count no of multiples of 5 present in natural numbers up till 100.
2. The sum of first n squares (1+4+9+. . . .n2) is given by formula

$$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$$

   write a program that checks this formula by inputing n.

3. Code the appropriate loop that displays the factorial of a number.
4. Calculate the permutation

$$p(n,k) = n!/(n-k)!\ n(n-1)(n-2)....(n-k+1)$$

5. Write a program that keeps on taking user values untill pressed -1 and determine which ws the largest number given by user.
6. Write a program that takes a number and length of number from user and displays its digits individually on separate line.
7. Code the program that identifies if the given number is prime or not.
8. Write a loop, so that they add up a series that starts with 1.0/3.0, and each term is 1.0/3.0 times the previous term. Your program should these terms and displays the sum as well. (The answer should be a little less that one-half. The series looks like $1/3 + 1/9 + 1/27 + 1/81 + ... + 1/59049$
9. Write a loop code that generates the series, starting with 1.0/3.0, and each term is 1.0/3.0 times the previous term, and finally, the signs alternate. (The answer should be a little less that one-quarter. The series looks like 1/3 - 1/9 + 1/27 - 1/81 + ... - 1/59049. Notice that this series doesn't have a term for i == 0.)

Nested Loops

10. Generate the following pyramid of X

```
   X
  XXX
 XXXXX
XXXXXXX
```

11. Write a simple nested for loop that runs one loop 5 times and second loop 5 times. Use the variable count to determine the number of times the nested loop runs.

12. Print the following pattern

```
*      *
**    **
*** ***
*******
```