Lab 5
Iterations and Arrays

1 Lab Objectives

- Learning Repetition Structures.
- Practice Array Problems.
- Verify your solutions on hackerrank https://www.hackerrank.com/programming-lab-5-f2019.

2 Problem 1 - Factorial

Given an integer n (≤ 12), your program should calculate and print factorial n ($n!$).

3 Problem 2 - Prime

Given an integer n, your program should test whether it is a prime number or not.

4 Problem 3 - sin(x)

The sine of x can be calculated approximately by summing the first N terms of the infinite series:

$sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + ...$ **(x in radians)**

Write a program that will read in a value for x (in degrees) and then calculate its sine by summing the first N terms, where N represents a positive integer that is read along with the value of x.

5 Problem 4 - Circular Right Shift

shift array of size n to the right k places. integers that are shifted to the right are added back to the array from the left Input Format
first line contains two integers n k second line contains n integers
Example: Sample Input
3 1
1 2 3
Sample Output
3 1 2

6 Problem 5 - Union and Intersection

Given two arrays of integers, print the union array and the intersection array.
Notes:

- Assume that the input arrays **will consist** of duplicates.
- Your program should read the input arrays from the user.
- You can assume that the input arrays will have a size ≤ 20.
- You should eliminate the duplicates from the output.

For example:

If the input was:

- 8
- 12 32 14 35 89 16 120 14
- 9
- 9 9 12 8 17 120 35 12 36

Your output should look like:

- Array1: 12, 32, 14, 35, 89, 16, 120
- Array2: 9, 12, 8, 17, 120, 35, 36
- Union: 12, 32, 14, 35, 89, 16, 120, 9, 8, 17, 36
- Intersection: 12, 35, 120

7 Notes

- You are required to bring the C programs to the lab on your laptop or on a flash memory.
- Cheating will be severely penalized (for both parties). So, it is better to deliver nothing than deliver a copy!
- You are encouraged to ask any questions on Piazza, or in person.

Good Luck