Computer Science Division
Department of Mathematics
Faculty of Science

Level 4- Semester 1
Course: COMP 403
Date: 2025

Q1. Write a c++ program to compute the sum of the following series $1 + 2 + 3 + \cdots + n$. Use multi-threading libraries pthread.h to make your program faster.

Q2. use structure to answer Q1.

Q3. In Mathematics, $\boldsymbol{\pi(x)}$ is defined as the number of prime numbers less than or equal to some number x.

Write a C++ program that computes $\boldsymbol{\pi(x)}$ for the following values of x.

x	$\pi(x)$
10	4
10^2	25
10^3	168
10^4	1,229
10^5	9,592
10^6	78,498

Use multi-threading libraries pthread.h to make your program faster.

Show the results as shown in the table above and add a third column called wTime which represents the time your program takes to compute $\boldsymbol{\pi(x)}$ for each x.

Q4- Write a C++ program using **(pthreads)** to perform **parallel matrix-vector multiplication**.