Ira A. Fulton Schools of Engineering
School of Computing, Informatics and Decision Systems Engineering

SER 450 **COMPUTER ARCHITECTURE**

Your Name: **Jacob Hreshchyshyn** Jacob Hreshchyshyn

PROJECT 1 WORKSHEET

I. Program execution times

Enter the program execution times for each of your runs below:

Run #	Description	Run Time (seconds)
1	Primes from 2 through 100k	0.001
2	Primes from 2 through 1M	0.002001
3	Primes from 2 through 10M	0.025022

II. What programming language did you use?

C++

III. Computer specifics

Fill out the following table for the computer on which your program runs were made:

Parameter	Value
Processor Type (e.g. Intel Core i5)	AMD Ryzen 7 5800X 8-Core
Processor Frequency (e.g. 2.5 GHz)	3.80 GHz
Operating System (e.g. Ubuntu Linux)	Windows 10

IV. CPI estimate

Complete the following table to calculate the CPI for each of your program runs. For column 3, note that 1GHZ = $1x10^9$ clocks per second.

Run	Estimated Instructions	Clocks Per Second (from part III)	Run Time (from Part I)	CPU Clocks (column 3* column 4)	CPI estimate (column 5 / column 2)
1	7.8×10^5	3.8×10^9	0.001	3,800,000	4.87
2	8.5×10^6	3.8×10^9	0.002001	7,603,800	0.89
3	9.1×10^7	3.8×10^9	0.025022	95,083,600	1.04

V. If the CPI estimates are different for each of your runs, what do you think might account for the differences?

The most notable difference in the CPI estimates is the CPI of Run 1 compared to the other two runs. This might be partially explained by the inaccuracies of the chrono high-resolution clock. On other attempts calculating primes from 2 through 100,000, the resulting time elapsed was shown as 0 seconds. Only after running with the 100,000 parameter a couple more times did I get a reasonable result of 0.001 seconds. This resulted in the CPU Clocks of Run 1 and Run 2 to be comparable, making the first run seem considerably slower than Runs 2 and 3.