COP4533-Programming-Assignment-1

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C++ was used for better scalibility and the C++ STL data structures

The files are :

matcher.cpp (Task A), verifier.cpp (Task B), example.in and example.out (expected input and output files), plot.py (graph generation), and main.cpp (scalability test)

Part A:

To run matcher, the example.in is provided

1. cd src
2. g++ matcher.cpp -o main
3. .\main, this will print out the matching results which you can compare with the expected example.out

Part C :

For Part C, to address the issues with graphing in C++, we created a main.cpp file that will take user input of n to be used as 2^n. It will then randomly generate preference lists for both hospitals and students. From there a matchingTime and verificationTime function will run and write the results into a .csv file using the formant n,matchingTime,verificationTime. The plot.py will then be run to generate the graph.

Observations:

The matching algorithm scales well alongside the increase of n; however as n increases, the verification runtime is much slower as shown by the graph. The runtime is recorded in microseconds for closer analysis.

How To Compile

1. cd src
2. g++ main.cpp -o main
3. .\main, this will prompt you to enter a value n and a string for a filename

4. ensure that plot.py is in the output folder, as well as having the correct name in pan.read_csv(" ".csv)
   Note: Two figures will appear, however, only look at figure 2.