Name: Zhiyuan Chang

Computing ID: vgs3qt

Homework Name: Homework7-BigOh.

Section 2:

Q1:

Running 20 random names and P1 is faster doesn't mean anything. We firstly need the number n to be large to see the efficiency of the algorithm. Additionally, hardware and the coding language impact the time used as well. We cannot purely put 20 names inside and check the speed.

Q2:

(a):

I will not agree, I will have an Asymptotic Analysis to two algorithms. Then, I can make sure that P1 is faster because its algorithm is better or it is because of its coding language or excellent hardware.

(b):

If P2 is faster, it still doesn't mean anything. We have to implement an Asymptotic Analysis and check their "Order" of performance. Having a clear and fair comparison of the growth rates, we can determine the efficiency of the algorithm. If P2 is now faster than P1 as 10,000 names are put, it is highly possible that P2 is more efficient than P1, but an Asymptotic Analysis is important.

Q3:

Changing the hardware of course affect the efficiency of algorithms. P1 may rely heavily on disk while P2 needs more CPU. And having a hardware that is slow at disk writing and reading will affect P1's performance. Having these experiments without controlling all the variables and factors will yield inaccurate results. P1 and P2 should go through Asymptotic Analysis.

Q4:

I think it is important to do both. Running tests will help me find more bugs or potential errors. It also tells me the performance of the program under different situation. Tests cases prove my assumptions and provide evidence. Additionally, reading the source code is crucial because I can first understand how the program works and then identify certain places that can do better, achieving greater efficiency.

Q5:

5.1: C

5.2: B

5.3: A

5.4: E

Section 3:

Q3.1: E

Q3.2: H

Q3.3: A

Q3.4: J