Lab 7 - DFS and Trees

Problem 1:

What data type in the C programming language allows for the largest values of factorial to be computed?

ANS

According to the reading material given in the lab,https://www.geeksforgeeks.org/data-types-in-c/

The data type allowing for the largest values of factorial to be computed is the *unsigned long long.* The big number of its range is 18 446 744 073 709 551 615.

Problem 2:

At what input value for the recursive factorial function does your computer start to 'crash' or really slow down when you try to compute a factorial? Is it the same value as the iterative function? Experiment and report your result.

ANS

As for the recursive factorial function, when the argument became 1000000, it crashed. It is not the same value as the iterative function.

As for the iterative factorial function, it did not crash when the argument became $1 * 10^{46}$, though we got the warning.

Problem 3:

In 2-3 sentences, describe why you believe you saw or didn't see differences between the iterative and recursive versions of factorial.

ANS

The recursive can be implementation while it could be easily done in a simple loop, it can be able to write the same code in 5 lines instead of 20 is a huge deal.

Recursive functions have to keep the function records in memory and jump from one memory address to another to be invoked to pass parameters and return values. That makes them very bad performance wise than iterative.