

In order to examine the time efficiency of the three methods given in the homework file, I created three different solutions based on the recitation material. For C++, fstream method was used. For C, fopen and mmap functions were used. All three methods gave me the same result for the occurrence of character 'a' in text file *loremipsum* which was 19082160. Moreover, in each method I read the characters char by char. Due to an error I encountered when running the code on flow, I could not time the execution time of each program within the code but used external resources instead. In C++ using fstream, it took 47.15 seconds. In C using fopen, it took 14.47 seconds. In C using mmap, it took 1.77 seconds. As understood, it is relatively shorter for a file this size to be searched in mmap method than others. If the file size was larger, the ratio would be the same between these methods as well.