CS 342 Operating System

Project #1

Processes, IPC, and Threads

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Section 1

TABLE OF CONTENTS

Introduction

The fundamental goal of the project is computing several statistics for integer data sets. While realizing this application program, the server and client-side is set. Server, Client, and the User are communicated over the requests. These requests are sent over POSIX (Portable Operating System Interface for Unix). There are specific request prompts such as count, avg. These requests are gathered from the client and after this request is fulfilled, another request is waited by the client.

Two different versions of this application programming, whose purpose is shared, were made. To implement child processes, the first method was to use the pipe logic and the second was to use the thread method. The result I expected before running the experiment was to expect the thread implementation to be faster than the pipe logic.

Computer Specifications

Windows 10

Intel® Core™ i7-9750H CPU @ 2.69GHz

16.0 GB

The code is tested by the Oracle Virtual Box, Ubuntu(64-bit) with a text editor. The terminal with C language compiler helps run both server and client-side at the same.

Graphs

Based on the instructions given in the project manual, the test cases are created. Firstly, the application asks for one of the requests in the list and then, user types in the command prompt. For the first case, the application is designed by the pipe. In that situation, the results are given below in Figure 1 and Table 1.

Requests	avg	avg 100 3000	count	count 75 340000	range 20000 25000 50	max
Time 'milliseconds	660 milliseconds	737 milliseconds	893 milliseconds	1066 milliseconds	1306 milliseconds	1479 milliseconds

Table 1- Pipe Version Test Case

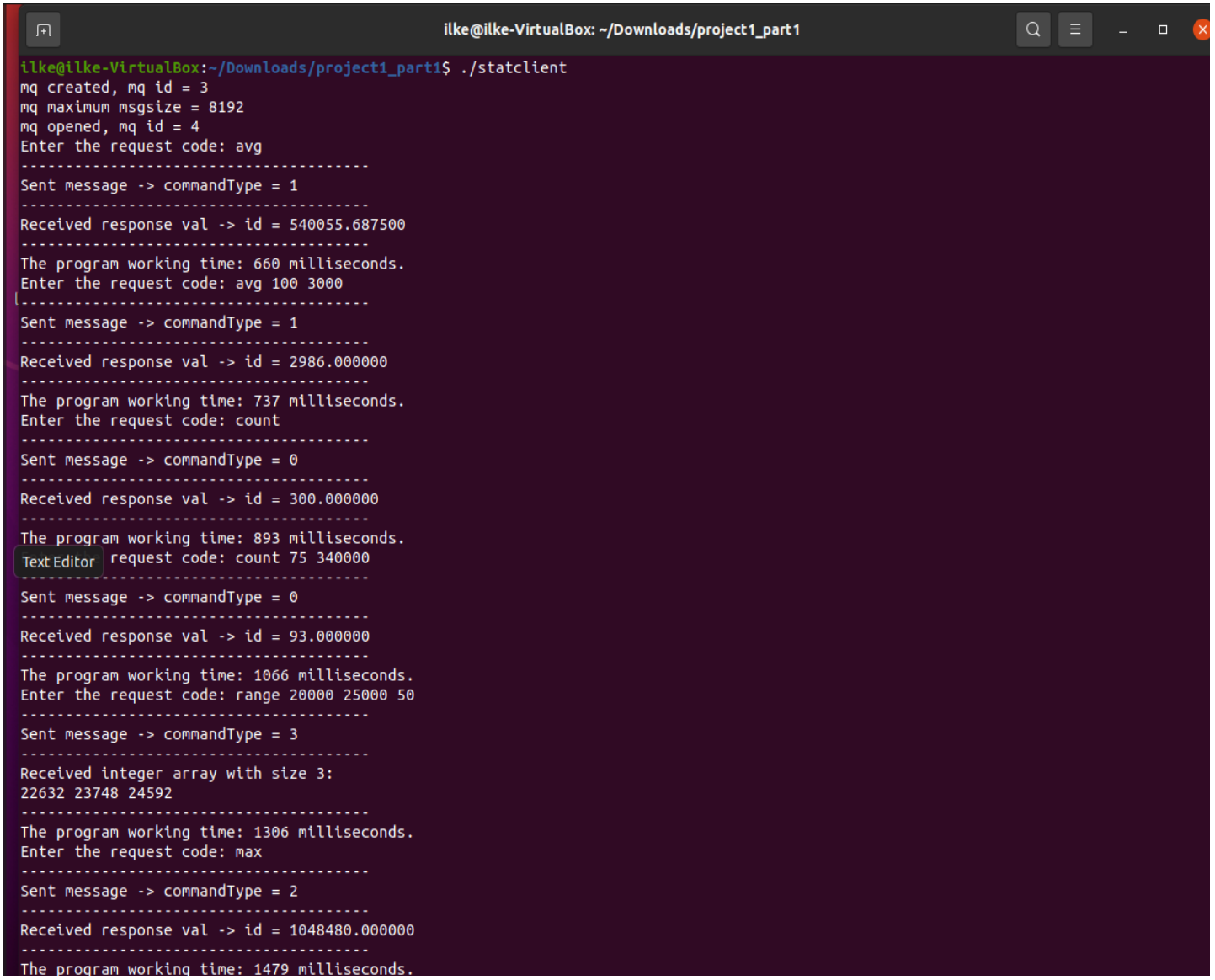


Figure 1- Pipe Version Test Case

Based on the instructions given in the project manual, the test cases are created. The second application asks for one of the requests in the list and then, user types in the command prompt. For the second case, the application is designed by the threads. In that situation, the results are given below in Figure 2 and Table 2.

Requests	avg	avg 100 3000	count	count 75 340000	range 20000 25000 50	max
Time 'milliseconds	555 milliseconds	617 milliseconds	681 milliseconds	739 milliseconds	818 milliseconds	888 milliseconds

Table 2- Thread Version Test Case

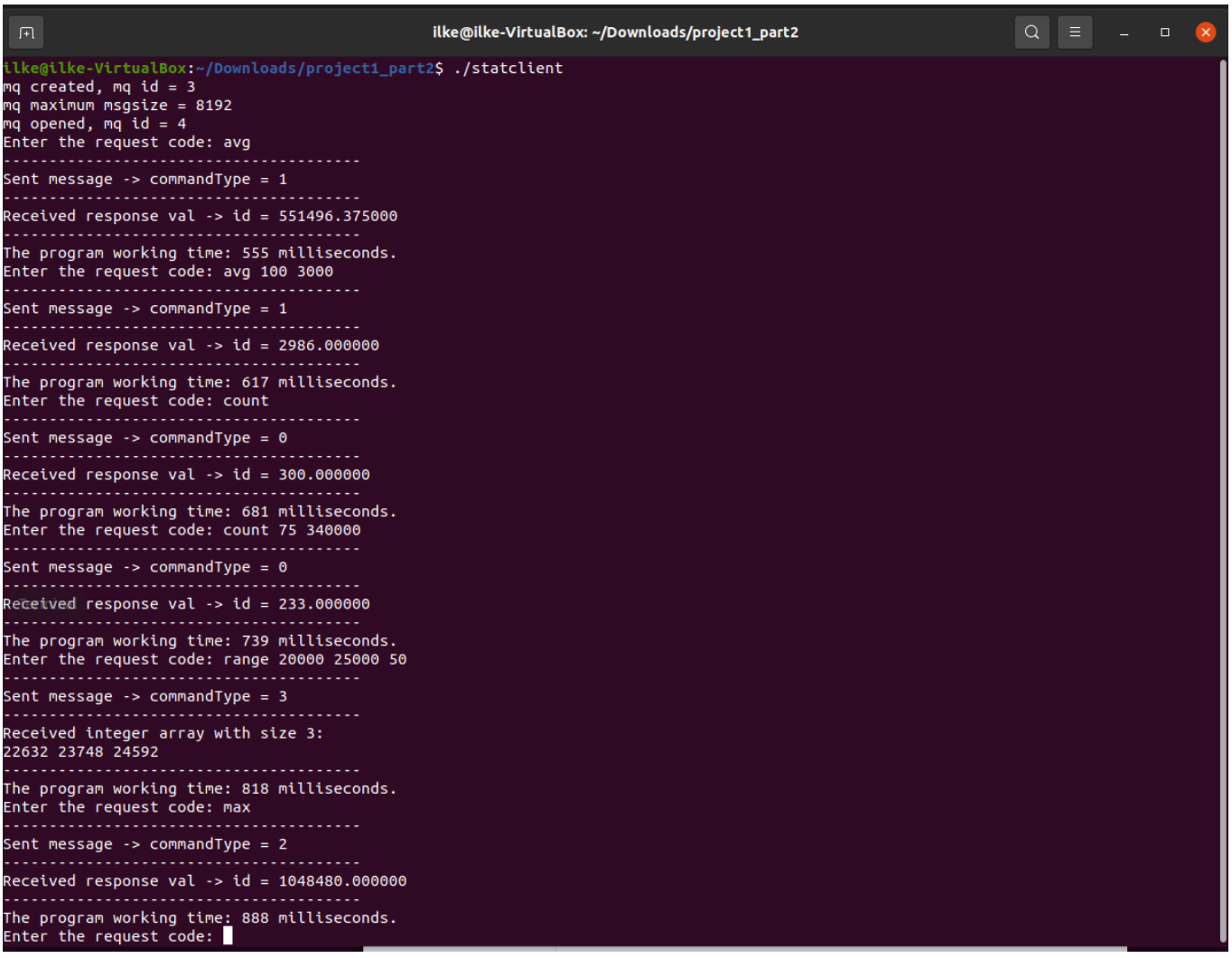
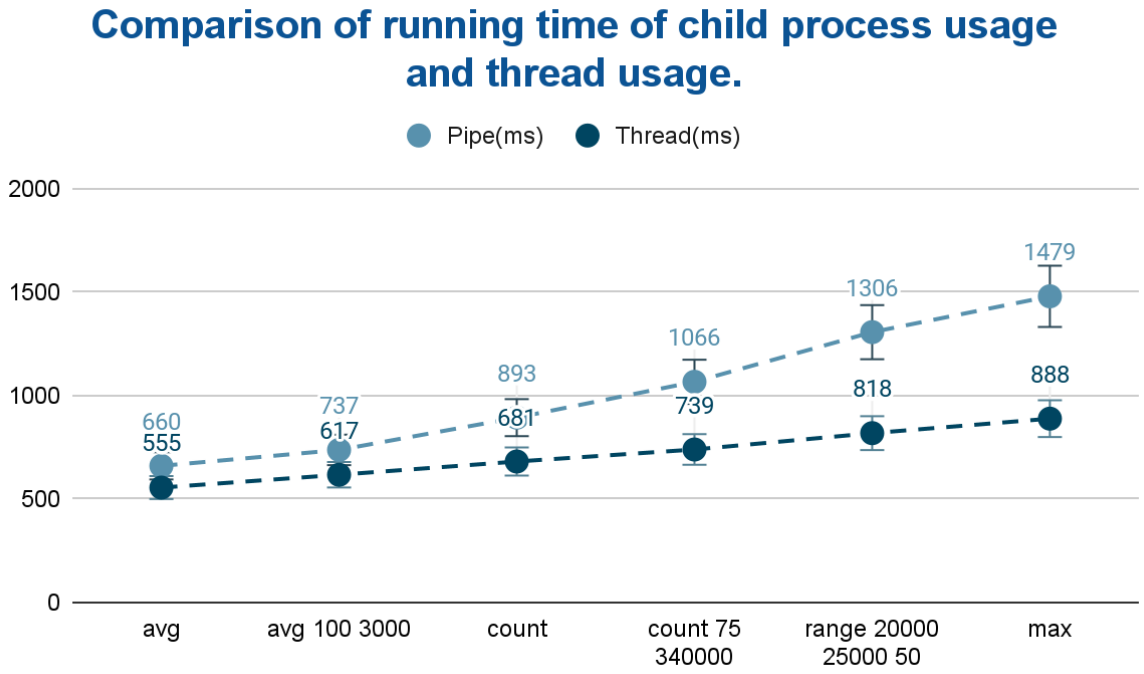


Figure 2- Thread Version Test Case



Conclusion

In conclusion, I have proven the conclusions envisaged at the beginning with the results I have obtained in the experiments. The execution time of threads is shorter than that of pipes. As a result, threads are much faster. In fact, the last example has almost half the speed compared to the pipe.