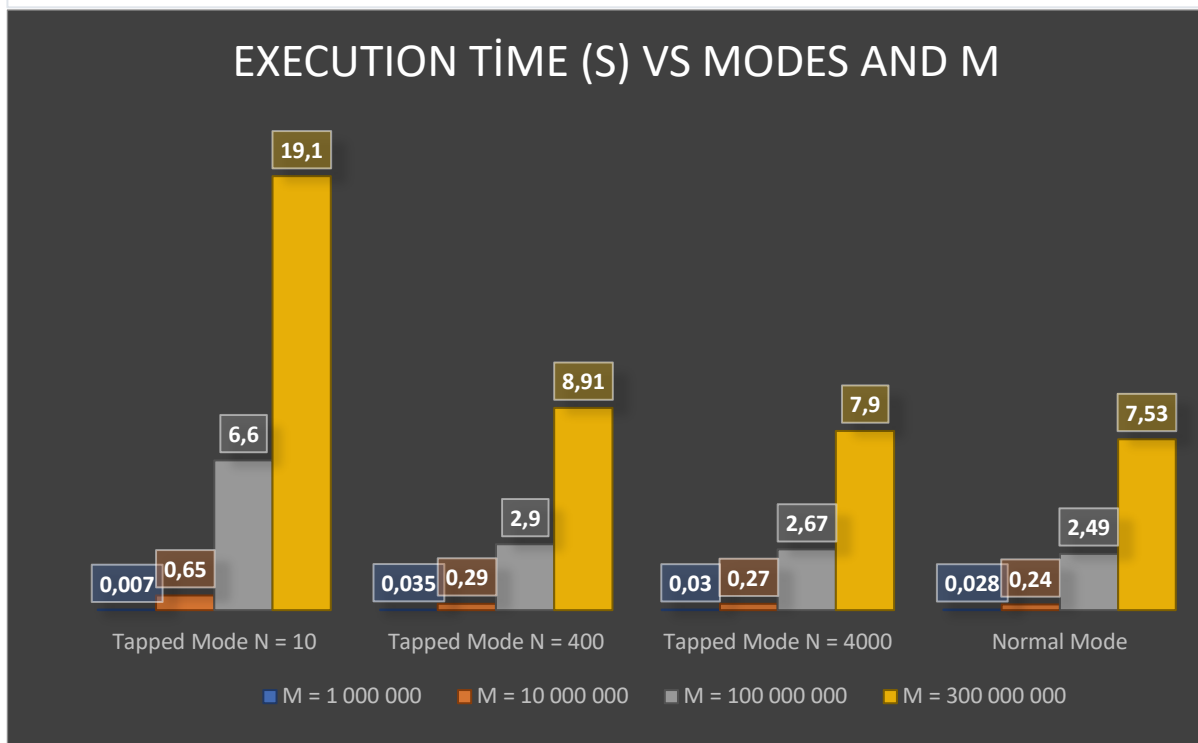
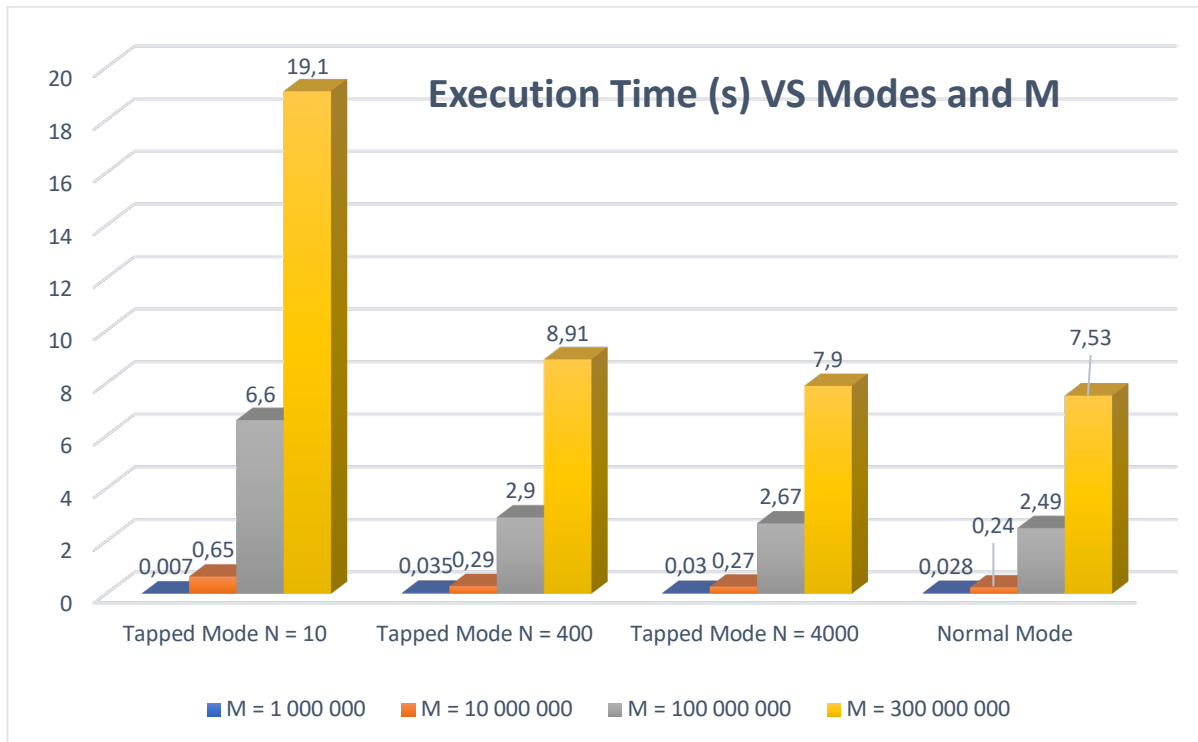


# CS 342

## Section 1

### Project 1 Report

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It can be found out from the experiments that normal mode is faster than the tapped mode with lower bytes read and write count. I think it is because in normal mode child processes use a direct pipe communication instead of moving data flow to main process and wait for main process to read data from the first pipe and write it second pipe. It should be the reason why normal mode is faster. Child processes are directly communicating by pipes without any such a delay. In tapped mode parent causes delay to send & receive data because for transferring data sender should write data to pipe and receiver should wait for data to read [1]. In our experiments 4000 bytes are transferred at a time maximum in tapped mode, so it caused more processes to execute and although it approached almost execution times of normal mode, it couldn't exceed execution times of normal mode.

It can be obtained from the various results of tapped mode with different N values (byte count at a time) as N increases, execution time of program decreases. In other words, delay is decreasing between two process. Processes are waiting for parent(main) process to receive & read data and write it on second pipe, which connects main process with receiver child process. For example, when  $N = 10$ , main process read 10 bytes at each time reads and writes. When M value is getting bigger and bigger like 300 000 000 the gap between difference of execution time of  $N = 4000$  and  $N = 10$  in tapped mode increases. On the  $N = 10$  side, 300 000 000 bytes have read and written in 19,1 seconds, however on the  $N = 4000$  side 300 000 000 bytes have read and written in 7.9 seconds. It means that  $N = 4000$  side is 2.41 times faster than the  $N = 10$  side when they execute 300 000 000 bytes.

To conclude, pipes are used for providing communication and data transmission for processes. As data (written & read at a time) increases, execution time decreases. Direct connection of pipes is much more faster than cross between a data flow.

## References:

[1] Linux Manual Page, *pipe(7)*, <https://man7.org/linux/man-pages/man7/pipe.7.html>

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