# Report Analysis A2

| | Run 1 | Run 2 | Run 3 | Run 4 | Avg |
|---|---|---|---|---|---|
| **Multi-threading - 10 threads** | 22.76 | 22.17 | 22.61 | 23.16 | 17.7 |
| **Multi-processing - 4 processes** | 13.56 | 12.74 | 12.56 | 13.17 | 13.1 |
| **MPI - 4 workers** | 13.29 | 13.37 | 12.61 | 13.94 | 13.3 |

The above table illustrates the time taken for Q2 for all techniques (T1, T2, and T3). To get better results, I have taken the average time across 4 runs with all three techniques.

Through this table, it is evident that multithreading with 10 threads is slower as compared to multiprocessing. As multiprocessing uses CPU cores rather than creating threads from a single process, it helps to increase the performance and thus will take lesser time than threads.

Comparing multiprocessing and MPI, the time taken are almost the same. As both use CPU processes to execute their tasks and as the number of processes used in both cases are the same, we can conclude here that their time taken will also be the same.

However, if a task like this runs over multiple computers, there could have been much bigger difference in their running times. Thus, deciding between using multiprocessing and MPI should be based on specific requirements and the infrastructure.