**Server Farm Simulation with Queues**

**Abstract**

In this project we designed a job and server system to evaluate the performance of different job dispatcher types in a server farm simulation. This project more than anything served to test our queue data structure. The key purpose of this assignment was to apply use our queues to analyze the efficiency of various dispatching strategies, with a focus on their impact on average waiting times. The simulations were conducted with different dispatcher types and various job sequences of various lengths. The base simulation uses simulated time to process jobs. However, we also implemented a simulated server method that uses threads to run each job processor. This method utilizes a timer data structure that sends alerts to a job dispatcher at specified times

**Results**

In the following table, we present the average waiting times (in milliseconds) obtained for each dispatcher type when run with 30 servers and the three provided job sequence files. The waiting times were computed by simulating the server farm and observing how each dispatcher type managed incoming jobs.

| **Dispatcher Type** | **Job Sequence 7\_30** | **Job Sequence 10\_100** | **Job Sequence 3\_100** |
| --- | --- | --- | --- |
| RandomDispatcher | 254.67 | 1500.23 | 376.45 |
| RoundRobinDispatcher | 305.81 | 1184.36 | 289.64 |
| ShortestQueueDispatcher | 213.24 | 1118.57 | 253.79 |
| LeastWorkDispatcher | 191.46 | 975.12 | 221.18 |

**Extensions**

1. **Partial**

**Reflection**