Client Part 1 - Server Test Results

```
64 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 10160
Threads Failed: 0
Wall Time: 6 seconds
Throughput: 1693 requests per second
**********
```

```
128 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 20320
Threads Failed: 0
Wall Time: 7 seconds
Throughput: 2902 requests per second
**********
```

```
32 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 5080
Threads Failed: 0
Wall Time: 8 seconds
Throughput: 635 requests per second
**********
```

```
256 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 40640
Threads Failed: 0
Wall Time: 8 seconds
Throughput: 5080 requests per second
**********
```

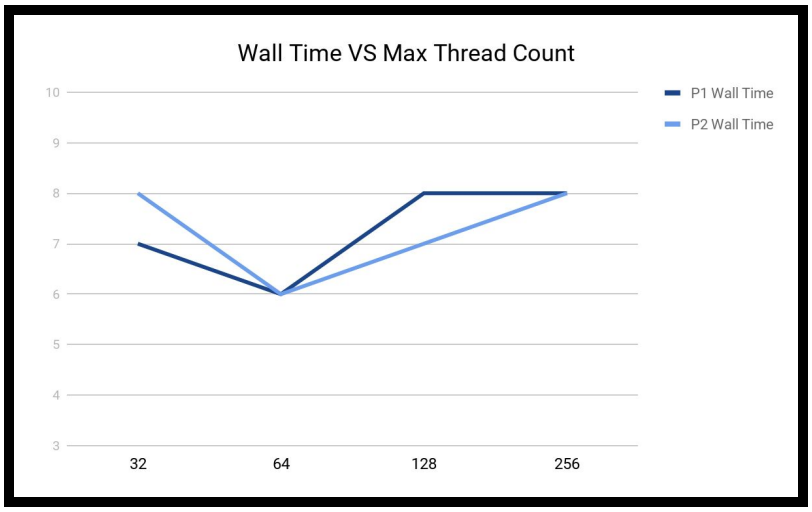
Client Part 2 - Server Test Results

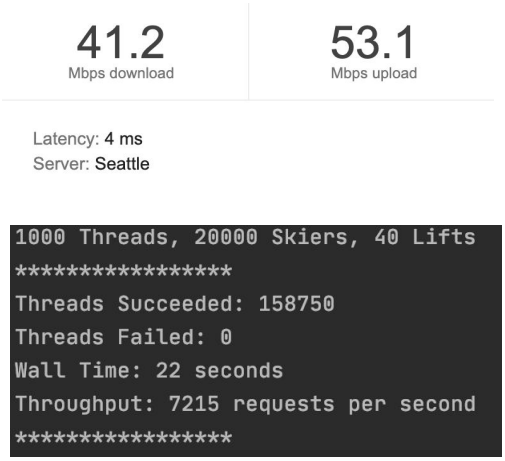
```
32 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 5080
Threads Failed: 0
Wall Time: 7 seconds
Throughput: 725 requests per second
**********
Mean Response: 24.093503937007874 ms
Median Response: 18.0 ms
Throughput 725.7142857142857 requests/second
P99 Response: 152 ms
Max Response: 551 ms
```

```
64 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 10160
Threads Failed: 0
Wall Time: 6 seconds
Throughput: 1693 requests per second
**********
Mean Response: 20.713188976377953 ms
Median Response: 19.0 ms
Throughput 1693.3333333333333 requests/second
P99 Response: 41 ms
Max Response: 309 ms
```

```
128 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 20320
Threads Failed: 0
Wall Time: 8 seconds
Throughput: 2540 requests per second
**********
Mean Response: 26.836811023622047 ms
Median Response: 24.0 ms
Throughput 2540.0 requests/second
P99 Response: 73 ms
Max Response: 444 ms
```

```
256 Threads, 20000 Skiers, 40 Lifts
**********
Threads Succeeded: 40640
Threads Failed: 0
Wall Time: 8 seconds
Throughput: 5080 requests per second
**********
Mean Response: 36.87878937007874 ms
Median Response: 33.0 ms
Throughput 5080.0 requests/second
P99 Response: 89 ms
Max Response: 567 ms
```





Conclusion:

- Wall time between part 1 and 2 were similar, with 64 threads being optimal for both.
- Close proximity to Oregon AWS region and moderate internet connection is adequate

Client Design:

RunClient is the main controller of the client-server simulation, using the Parser class to validate command line arguments. The parser will also accept *"default"* as the sole parameter to run the program with the default values as listed for this assignment.

After validating the parameters, a thread pool is created based on the total number of threads required for all 3 phases. A distinction in each client instance between Part 1 and 2 is the use of Runnable VS Callable threads. Because we want obtain information about each response from the SkierAPI in Part 2 of the assignment, each thread must extend Callable to retrieve this data.

When the pool has been terminated and all 3 phases are complete, the ResponseAnalysis class runs simple calculations on the response data to obtain mean, median, max, p99 response times for the simulation. This response data is also structures such that it can be directly written to a CSV file in the root directory of the project after each run.