# ASL Grade Breakdown

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Dear student,

Below, you will find the evaluation of your report for the Advanced
Systems Lab. The grade depends on your description of your system, the
design and quality of your experiments, the methodology used to
investigate the system, and your ability to accurately explain and model
the behavior of your system.

Please note that we will not discuss the grading via email. If you want
to look in detail at your report, you have the chance to do this at
the exam review.
Time and date of the exam review will be announced shortly.

Kind regards,
Your ASL TAs

| ITEM | POINTS | | GRADE |
|---|---|---|---|
| **1. System Overview** | **75** | | **65** |
| Mapping code to functionality / Explanation how queues and threads are implemented | 10 | x | 10 |
| Figures of all threads and all queues + memcahed servers | 5 | x | 5 |
| Description of the data-structures for holding connections | 6 | x | 6 |
| Description how requests are parsed | 6 | x | 6 |
| Description how SET requests are processed | 6 | x | 6 |
| Description how GET requests are processed | 6 | x | 6 |
| Description how Multi-GET requests are processed | 6 | x | 6 |
| Description how work is balanced (empirical proof) | 10 | x | 10 |
| Explanations related to statistics | 10 | x | 10 |
| Details for artifacts necessary to understand the behavior | 10 | . | 0 |
| **2. Baseline without Middleware** | **75** | | **70** |
| **2.1. One Server** | **28** | | |
| Setup explained | 2 | x | 2 |
| Correct throughput graph for #clients (saturation phase included, readable and has acceptable granularity) | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Correct response time graph for #clients | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 4 | x | 4 |
| Identify and explain correctly saturation and under saturation in the system | 5 | x | 5 |
| What further conclusions can be drawn from the experiments | 5 | . | 0 |
| **2.2. Two Servers** | **28** | | |
| Setup explained | 2 | x | 2 |
| Correct throughput graph for #clients (saturation phase included) | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Correct response time graph for #clients | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 4 | x | 4 |
| Identify and explain correctly saturation and under saturation in the system | 5 | x | 5 |
| What further conclusions can be drawn from the experiments, comparisons with one server | 5 | x | 5 |
| **2.3. Summary** | **19** | | |
| Maximum throughput table correctly filled out | 4 | x | 4 |
| Bottleneck component is identified and clearly stated | 5 | x | 5 |
| Summary compares read-only and write-only workloads | 5 | x | 5 |
| Summary compares one-server and two-server configurations | 5 | x | 5 |
| **3. Baseline with Middleware** | **90** | | **90** |
| **3.1. One Middleware** | **32** | | |
| Setup explained | 2 | x | 2 |
| Correct throughput graph for #clients and #threads (saturation phase included, readable and has acceptable granularity) | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Correct response time graph for #clients and #threads | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 4 | x | 4 |
| Explanation correlates with graphs | 2 | x | 2 |
| > Explanations are related to system elements: identify bottleneck, queue length, system saturation | 6 | x | 6 |
| > Explanations are backed up by data (additional graphs or experiments if needed) | 6 | x | 6 |

## 3.2. Two Middlewares — 32

| Item | | | |
|---|---|---|---|
| Setup explained | 2 | x | 2 |
| Correct throughput graph for #clients and #threads (saturation phase included) | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Correct response time graph for #clients and #threads | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 4 | x | 4 |
| Explanation correlates with graphs | 2 | x | 2 |
| > Explanations are related to system elements: identify bottleneck, queue length, system saturation | 6 | x | 6 |
| > Explanations are backed up by data (additional graphs or experiments if needed) | 6 | x | 6 |

## 3.3. Summary — 26

| Item | | | |
|---|---|---|---|
| Maximum throughput table correctly filled out | 6 | x | 6 |
| Summary is consistent with previous experiments | 5 | x | 5 |
| Summary identifies trends and important parameters for performance | 5 | x | 5 |
| Summary relates table elements (throughput, response time, average queue time, etc.) | 5 | x | 5 |
| Summary compares one and two middleware configurations | 5 | x | 5 |

## 4. Throughput for Writes — 90 — 90
### 4.1. Full System — 50

| Item | | | |
|---|---|---|---|
| Setup explained | 2 | x | 2 |
| Correct throughput graph for #clients and #threads (saturation phase included, readable and has acceptable granularity) | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Correct response time graph for #clients and #threads | 4 | x | 4 |
| Graph has error metric | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 8 | x | 8 |
| Explanation correlates with graphs | 8 | x | 8 |
| > Explanations are related to system elements: identify bottleneck, queue length, system saturation | 10 | x | 10 |
| > Explanations are backed up by data (additional graphs or experiments if needed) | 10 | x | 10 |

### 4.2. Summary — 40

| Item | | | |
|---|---|---|---|
| Maximum throughput table correctly filled out | 8 | x | 8 |
| Summary is consistent with previous experiments | 8 | x | 8 |
| Summary identifies trends and important parameters for performance | 8 | x | 8 |
| Summary relates table elements (throughput, response time, average queue time, etc.) | 8 | x | 8 |
| Summary relates different configurations (number of worker threads) | 8 | x | 8 |

## 5. Gets and Multi-Gets — 90 — 80
### 5.1. Sharded Case — 26

| Item | | | |
|---|---|---|---|
| Setup explained | 2 | x | 2 |
| Explanation why configuration has been chosen | 2 | x | 2 |
| Response time percentile graphs: > Graph is readable | 2 | x | 2 |
| > 25th, 50th, 75th, 90th, and 99th percentiles present | 2 | x | 2 |
| > Multi-gets of 1, 3, 6, and 9 present | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 4 | x | 4 |
| Explanation correlates with graphs | 2 | x | 2 |
| > Explanations are related to system elements: identify bottleneck, queue length, system saturation | 5 | x | 5 |
| > Explanations are backed up by data (additional graphs or experiments if needed) | 5 | . | 0 |

### 5.2. Non-Sharded Case — 26

| Item | | | |
|---|---|---|---|
| Setup explained | 2 | x | 2 |
| Explanation why configuration has been chosen | 2 | x | 2 |
| Response time percentile graphs: > Graph is readable | 2 | x | 2 |
| > 25th, 50th, 75th, 90th, and 99th percentiles present | 2 | x | 2 |
| > Multi-gets of 1, 3, 6, and 9 present | 2 | x | 2 |
| Sanity checks of the data (interactive law, consistent with other graphs, etc.) | 4 | x | 4 |
| Explanation correlates with graphs | 2 | x | 2 |
| > Explanations are related to system elements: identify bottleneck, queue length, system saturation | 5 | x | 5 |
| > Explanations are backed up by data (additional graphs or experiments if needed) | 5 | . | 0 |

### 5.3. Histogram — 14

| Item | | | |
|---|---|---|---|
| Histograms present and correct (buckets are of same width, etc) | 8 | x | 8 |
| > Sanity checks (e.g., client rt > middleware rt, etc.) | 6 | x | 6 |

### 5.4. Summary — 24

| Item | | | |
|---|---|---|---|
| Summary is consistent with previous experiments | 6 | x | 6 |
| Summary relates performance for different request sizes | 6 | x | 6 |
| Summary related the sharded and non-sharded modes | 6 | x | 6 |
| Summary relates the response time on the clients and middleware (e.g. histograms) | 6 | x | 6 |

## 6. 2K Analysis — 90 — 82
### 6.1. Write-Only — 45

| Item | | | |
|---|---|---|---|
| All factors included in analysis | 6 | x | 6 |
| Repetitions included | 6 | x | 6 |

| | | | |
|---|---|---|---|
| Clear statement which model is used and motivated | 4 | . | 0 |
| Analysis is mathematically sound | 10 | x | 10 |
| Explanation relating analysis to implementation | 10 | x | 10 |
| Impact of the parameters on throughput and response time | 4 | x | 4 |
| Findings are consistent with previous sections | 5 | x | 5 |

### 6.2. Read-Only — 45

| | | | |
|---|---|---|---|
| All factors included in analysis | 6 | x | 6 |
| Repetitions included | 6 | x | 6 |
| Clear statement which model is used and motivated | 4 | . | 0 |
| Analysis is mathematically sound | 10 | x | 10 |
| Explanation relating analysis to implementation | 10 | x | 10 |
| Impact of the parameters on throughput and response time | 4 | x | 4 |
| Findings are consistent with previous sections | 5 | x | 5 |

## 7. Queuing Model — 90 — 82

### 7.1. M/M/1 Model — 28

| | | | |
|---|---|---|---|
| Values for mu and lambda are clearly stated | 2 | x | 2 |
| Motivation for choice of mu and lambda | 8 | x | 8 |
| Rho specified and system is stable | 2 | x | 2 |
| Additional parameters listed (at least 2 parameters) | 6 | x | 6 |
| Comparison between model and experiments | 2 | x | 2 |
| > Explanation of differences/similarities (parameter 1) | 4 | x | 4 |
| > Explanation of differences/similarities (parameter 2) | 4 | x | 4 |

### 7.2. M/M/m Model — 28

| | | | |
|---|---|---|---|
| Values for m, mu and lambda are clearly stated | 2 | x | 2 |
| Motivation for choice of m, mu and lambda | 8 | x | 8 |
| Rho specified and system is stable | 2 | x | 2 |
| Additional parameters listed (at least 2 paramaters) | 6 | x | 6 |
| Comparison between model and experiments | 2 | x | 2 |
| > Explanation of differences/similarities (parameter 1) | 4 | x | 4 |
| > Explanation of differences/similarities (parameter 2) | 4 | . | 0 |

### 7.3. Network of queues — 34

| | | | |
|---|---|---|---|
| Definition of network | 2 | x | 2 |
| Description how components map to system and why the model is useful | 8 | x | 8 |
| Values for (m_i,mu_i, V_i) for each component (one middleware) | 2 | x | 2 |
| Motivation for choice of m_i, mu_i and V_i (one middleware) | 2 | x | 2 |
| System throughput is calculated or plotted/listed (one middleware) | 2 | . | 0 |
| Bottleneck component is identified and clearly stated (one middleware) | 2 | x | 2 |
| Comparison between model and experiments (one middleware) | 4 | x | 4 |
| Values for (m_i,mu_i, V_i) for each component (two middlewares) | 2 | x | 2 |
| Motivation for choice of m_i, mu_i and V_i (two middlewares) | 2 | x | 2 |
| System throughput is calculated or plotted/listed (two middlewares) | 2 | . | 0 |
| Bottleneck component is identified and clearly stated (two middlewares) | 2 | x | 2 |
| Comparison between model and experiments (two middlewares) | 4 | x | 4 |

## 8. Deductions — 5

| | | | |
|---|---|---|---|
| Code does not compile or does not run | 5 | x | 5 |
| Code needs small modifications to run | 0 | | 0 |
| Code runs but does not pass tests | 0 | | 0 |
| Interactive law does not hold for all graphs | 0 | | 0 |
| Results not correlated between sections | 0 | | 0 |
| Formatting issues / Page limit | 0 | | 0 |

## TOTAL — 554

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