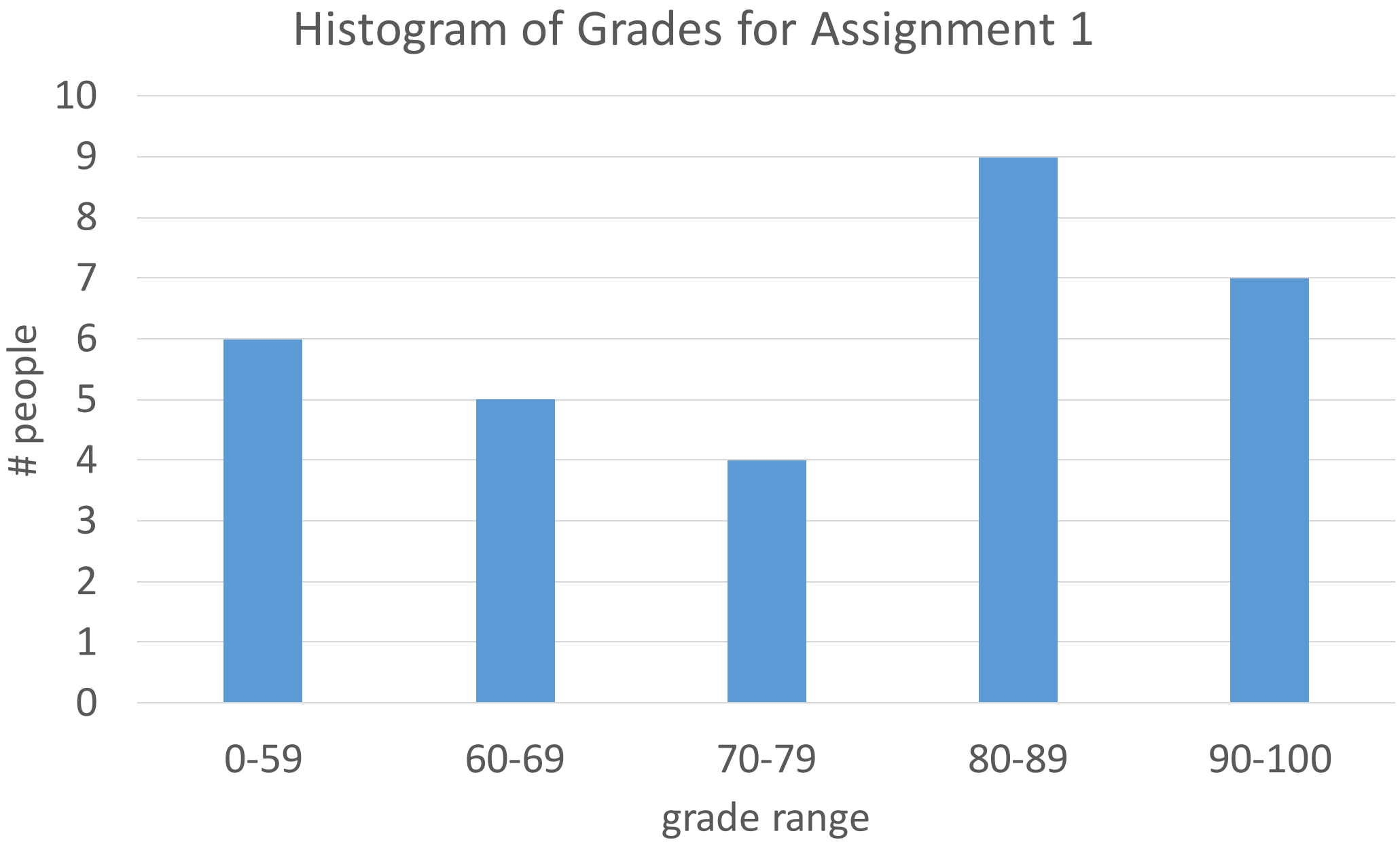
CS 377P Assignment 1

TA: Yi-Shan Lu

CS, UT Austin

2/12/2018


Histogram of Grades for Assignment 1
10
9
8
7
6
5
4
3
2
1
0
people
0-59
60-69
70-79
80-89
90-100
grade range

Statistics

- Average: 69.16
- Standard deviation: 28.89
- Median: 80

Validating Your Measurement

- For all 6 loop permutations of MMM, # instructions should be roughly the same using the same size of matrices.
  - Total count
  - Loads and stores
  - Floating point instructions
- # instructions should grow in cubic fashion as the size of matrices gets larger.
  - 1M FP instructions for 100*100 matrices
    → 8M FP instructions for 200*200 matrices

Common Deduction of Points

- Not using serializing instructions right before and right after measured code to avoid compiler optimizations and hardware out-of-order execution.
  - # instructions vary too much.
  - # cycles may also be influenced.
- Not flushing data caches before measurement to get the same initial condition.
  - There are 3 levels of data caches.
  - Flushing only L1D and L2D may not be enough to have the same initial condition for all measurements.

Representing Matrices as Arrays of Arrays

- Bad spatial locality for different rows.
- May introduce conflict misses for different rows.
- More dependent loads.
- More malloc/free calls.