Histogram of Grades for Assignment 1

- 0-59: 6 people
- 60-69: 5 people
- 70-79: 4 people
- 80-89: 9 people
- 90-100: 6 people
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.