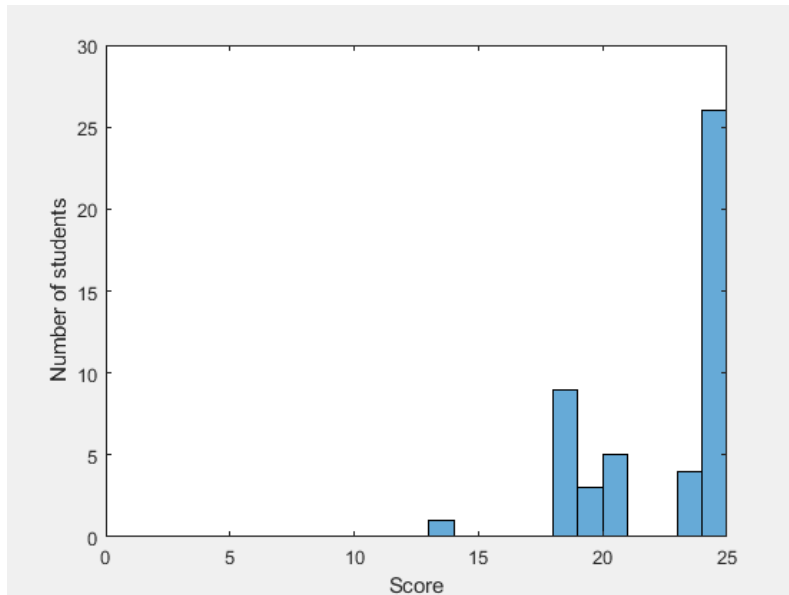


Prelim 2 Problem 2 (Problem 5 Overall) Fall 2020 MAE 4730/4730

Mean 22.25 Median 24 Standard Dev 3.19



General Comments:

As you can see from the histogram, over half the class nailed this problem, a few just barely missed that, and the rest tended to make the same type of mistakes. These narrowly-groups outcomes was not what I would have predicted since you were allowed to do this problem multiple ways (could have used Newton-Euler, energy conservation, Lagrange, DAE, and any of these with varying MATLAB involvement), but I guess the mistake-making was universal among them.

Good things:

- Lagrangians were 99% correct among all students using Lagrange's equations
- Similar success with differentiating the curve shape
- Similarly again for LMB setup and FBD's
- It was nice to see a variety of approaches, many of which worked out correct

Common mistakes:

- Students who lost 1-2 points were off by a sign or a factor (like A, c, or x')
- Students in the other grouping made major mistakes after a correct problem setup, i.e.
 - **(Most)** Right Lagrangian, major misuse of Lagrange's equations in calculus/algebra
 - Right LMB dotted with wrong unit vector (tangent to wire path)
 - Major errors in MATLAB solving/obtaining equations after correct setup