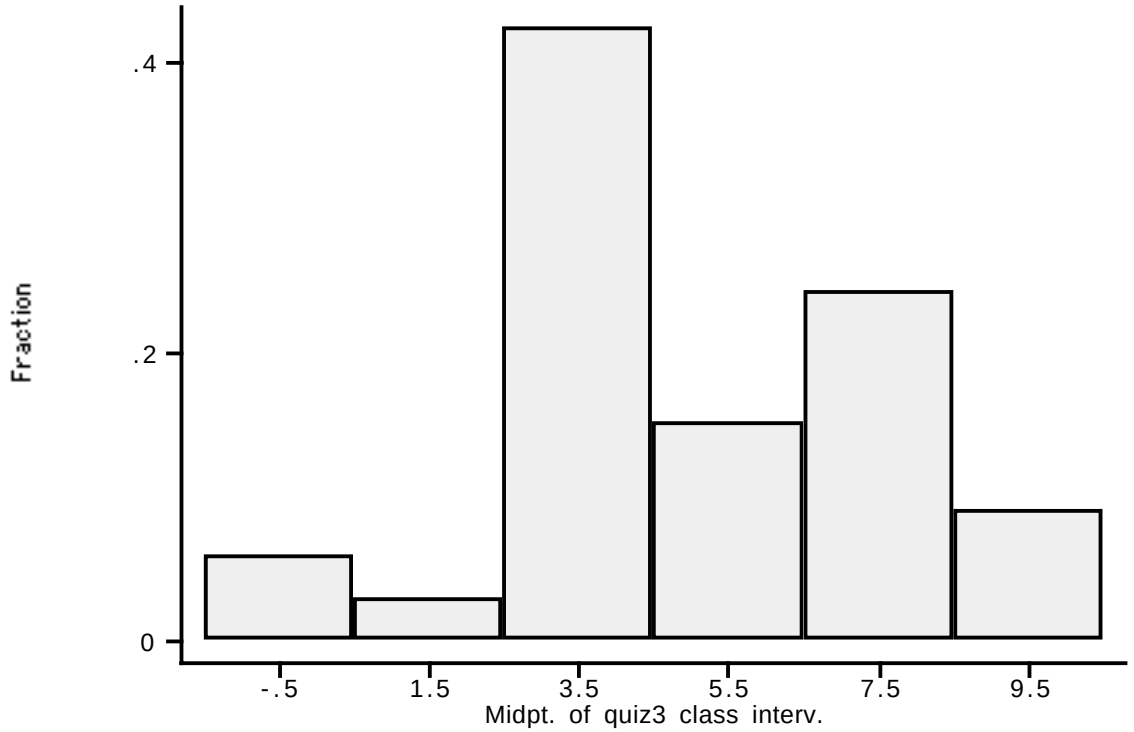

Average: 5.1, SD = 2.6, Median = 4, Min = 0, max = 10.

Quiz 3
April 26, 2001

Name:
Section:

1. (3 points) A researcher calculates that the correlation between height and weight for 25 subjects is r = 0.78. But then he realizes that the scales he had used to weigh the subjects was mis-calibrated and subtracted 2 pounds from every subject. He goes through the data and corrects this error. Will this change the correlation? Why or why not?

No, it will not affect the correlation. The correlation measures the strength of a linear relationship: how closely clustered are the points around a line? Subtracting two pounds from every subject does not affect this relationship, it merely shifts the cluster over (down if weight is the y-variable, to the left if it is the x-variable) by 2 pounds.

2. The "empirical rule" says that (a) 68% of the observations are within 1 SD of the average, (b) 95% are within 2 SDs of average and (c) 99.7% are within 3 SDs. Suppose the average height in a very large sample was 65 inches and the SD was 2.7 inches. One subject was so tall that only 2.5 % of the people were taller than he was.
a) (3 points) What is his height in terms of standard units?

The empirical rule applies to symmetric distributions, and it is safe to assume heights are symmetrically distributed. 95% are within 2 SDs of the average, which means that 2.5% must be 2 SDs above average (and taller), and 2.5% must be 2 SDs below average (or shorter). Therefore, this subject must be exactly 2 SDs taller than average (since 2.5% are taller than he.) This means that in standard units, his height is 2.

b) (4 points) What is his height in inches?

Two SDs is 2*2.7 = 5.4 inches. Since he is 2 SDs taller than average, this is 65 + 5.4 = 70.4"