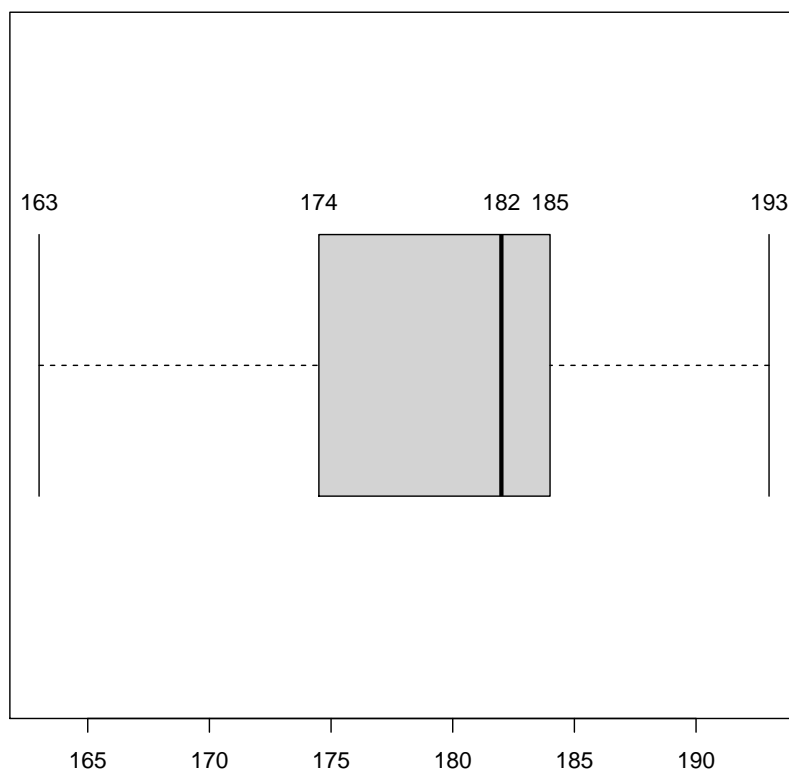


Homework Assignment 3

1. The figure below shows a box plot of presidential heights. The figure indicates that the distribution is slightly skewed to the left, because the 50% with heights between [182, 193] is very dense while the other half [163, 182] is spread out.



2. According to Chebyshev's theorem, at least $(1 - \frac{1}{1.5^2}) \times 100 = 55.56\%$ of the candidates fall within $179.81 \pm 1.5 * 6.875 = [169.5, 190.13]$. In reality, 38 presidents or or $\frac{38}{43} \times$

100 = 88.37% fall within this height range.

3. In this question, you are supposed to notice that the interval $[172.935, 186.685]$ represents one standard deviation around the mean. That is $179.81 \pm 6.875 = [172.935, 186.685]$. Assuming the distribution of heights is bell-shaped, you can predict that 68% of presidential heights will fall within this interval. It turns out that 29 presidents or $\frac{29}{43} \times 100 = 67.44\%$ fall within this range.
4. The Z scores of Abraham Lincoln, Dwight D. Eisenhower, and James Madison are 1.92, -0.12, -2.45, respectively. This means that Lincoln is too tall, Eisenhower is of average presidential height, and Madison is too short.