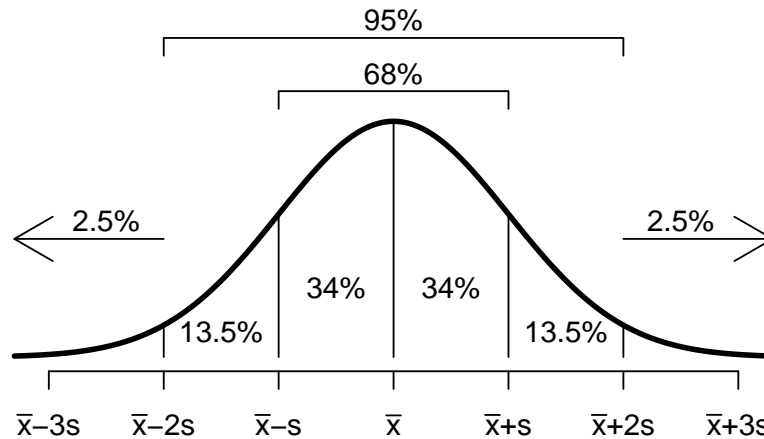


1. Problem:

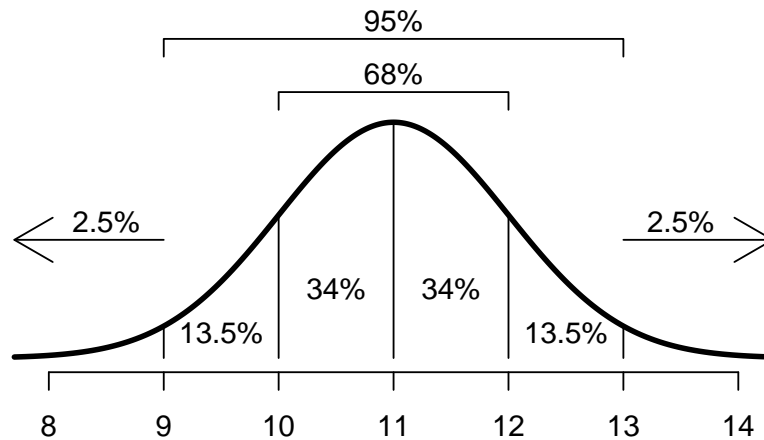
The figure below summarizes the *standard deviation rule* for normal distributions. In the figure, \bar{x} is the mean and s is the standard deviation. The percentages show the fraction of measurements that fall within various intervals.



A specific distribution is approximately normal with mean $\bar{x} = 11$ and standard deviation $s = 1$.

- (a) What percent of the measurements are greater than 10?
- (b) What percent of the measurements are less than 9?
- (c) What measurement is greater than 84% of the measurements?
- (d) What measurement is less than 50% of the measurements?
- (e) What percent of the measurements are between 10 and 12?

Solution: It is probably best to start by redrawing (relabeling) the normal distribution with the specific values.



- (a) Because we are asked for the percent of measurements *greater* than 10, we add the areas to the right of 10.

84%

- (b) Because we are asked for the percent of measurements *less* than 9, we add the areas to the left of 9.

2.5%

- (c) We determine which leftward area has a total of 84%. This occurs at 12.

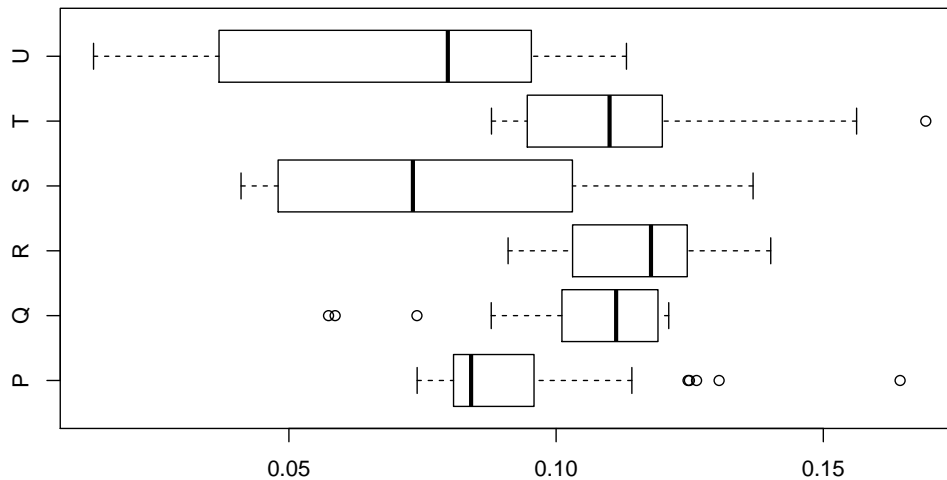
- (d) We determine which rightward area has a total of 50%. This occurs at 11.

- (e) We add the areas from 10 to 12.

68%

2. Problem:

Six random variables were each measured 25 times. The resulting boxplots are shown.



- (a) Which variable produced the largest measurement?
- (b) Which variable produced the smallest measurement?
- (c) Which distribution has the largest median?
- (d) Which distribution has the smallest median?
- (e) Which distribution has the largest 25th percentile?
- (f) Which distribution has the smallest 25th percentile?
- (g) Which distribution has the largest 75th percentile?
- (h) Which distribution has the smallest 75th percentile?

Solution:

- (a) T
- (b) U
- (c) R
- (d) S
- (e) R
- (f) U
- (g) R
- (h) U