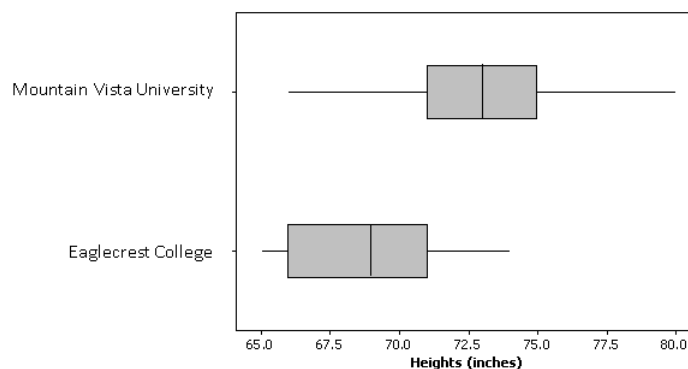


Lesson Summary

When comparing the distribution of a quantitative variable for two or more distinct groups, it is useful to display the groups' distributions side by side using graphs drawn to the same scale. This makes it easier to describe the similarities and differences in the distributions of the groups.

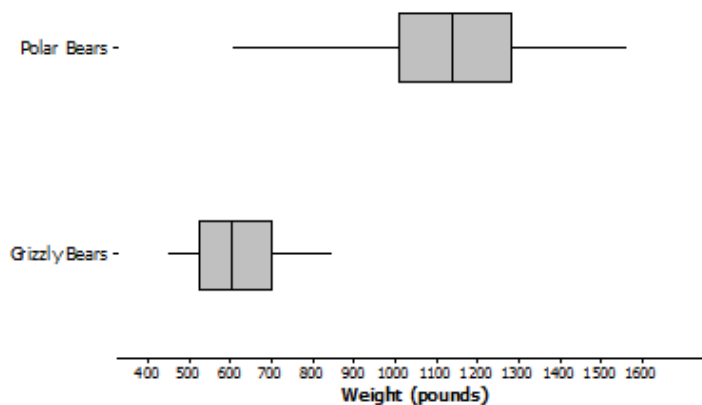
Problem Set

1. College athletic programs are separated into divisions based on school size, available athletic scholarships, and other factors. A researcher wondered if members of swimming and diving programs in Division I (usually large schools that offer athletic scholarships) tend to be taller than the swimmers and divers in Division III programs (usually smaller schools that do not offer athletic scholarships). To begin the investigation, the researcher creates side-by-side box plots for the heights (in inches) of 41 male swimmers and divers at Mountain Vista University (a Division I program) and the heights (in inches) of 10 male swimmers and divers at Eaglecrest College (a Division III program).



- a. Which data set has the smaller range?
- b. True or false: A swimmer who had a height equal to the median for the Mountain Vista University would be taller than the median height of swimmers and divers at Eaglecrest College.
- c. To be thorough, the researcher will examine many other colleges' sports programs to further investigate the claim that members of swimming and diving programs in Division I are generally taller than the swimmers and divers in Division III. But given the graph above, in this initial stage of her research, do you think that the claim might be valid? Carefully support your answer using summary measures or graphical attributes.

2. Data on the weights (in pounds) of 100 polar bears and 50 grizzly bears are summarized in the box plots shown below.

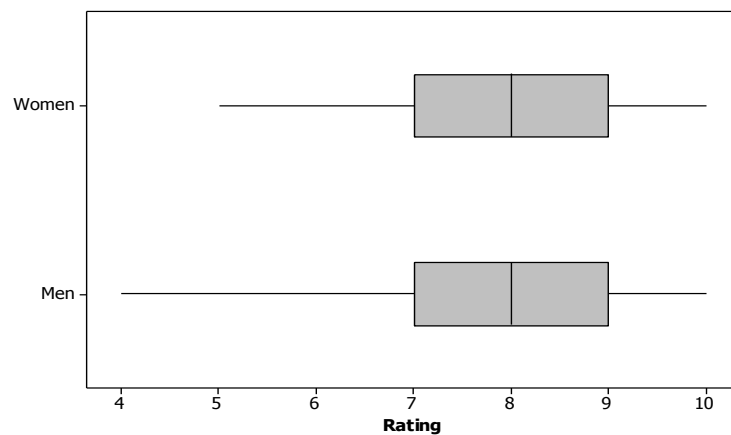


- True or false: At least one of the polar bears weighed more than the heaviest grizzly bear. Explain how you know.
- True or false: Weight differs more from bear to bear for polar bears than for grizzly bears. Explain how you know.
- Which type of bear tends to weigh more? Explain.

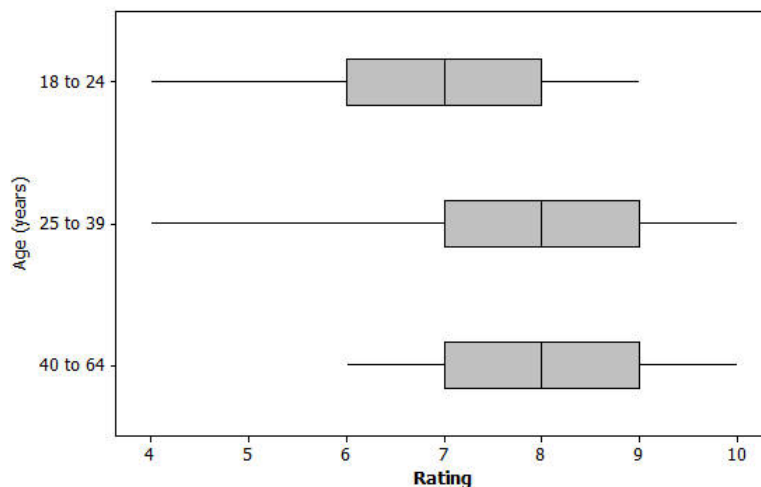
3. Many movie studios rely heavily on viewer data to determine how a movie will be marketed and distributed. Recently, previews of a soon-to-be-released movie were shown to 300 people. Each person was asked to rate the movie on a scale of 0 to 10, with 10 representing “best movie I have ever seen” and 0 representing “worst movie I have ever seen.”

Below are some side-by-side box plots that summarize the ratings by gender and by age.

For 150 women and 150 men:



For 3 age groups:



- Does it appear that the men and women rated the film in a similar manner or in a very different manner? Write a few sentences explaining your answer using comparative information about center and variability.
- It appears that the film tended to receive better ratings from the older members of the group. Write a few sentences using comparative measures of center and spread or aspects of the graphical displays to justify this claim.