Scatter Plots

Scatter Plots can be used to show a relationship between two quantitative columns. Each row in the dataset is represented by a point, with one column providing the x-value and the other providing the y-value. The resulting "point cloud" makes it possible to look for a relationship between those two columns.

- If the points in a scatter plot appear to follow a straight line, it is possible that a linear relationship exists between those two columns. A number called a **correlation** can be used to summarize this relationship.
- r is the name of the **correlation statistic**. The r-value will always fall between −1 and +1. The sign tells us whether the correlation is positive or negative. Distance from 0 tells us the strength of the correlation.
  - −1 or +1 is really strong.
  - 0 means no correlation.
- The correlation is **positive** if the point cloud slopes up as it goes farther to the right. It is **negative** if it slopes down as it goes farther to the right. If the points are tightly clustered around a line, it is a **strong** correlation. If they are loosely scattered, it is a **weak** correlation.
- Points that are far above or below the cloud of points in a scatter plot are called **outliers**.
- We graphically summarize this relationship by drawing a straight line through the data cloud, so that the vertical distance between the line and each of the points is as small as possible. This line is called the **line of best fit** and allows us to predict y-values based on x-values.