Section 2.2, More Graphs and Displays

1 Stem-and-Leaf Plot

For a stem-and-leaf plot, each number is separated into a "stem" (typically the number's leftmost digits) and a "leaf" (typically the number's rightmost digit). Each leaf should be a single digit. The stems should be arranged vertically from top to bottom. The plot looks similar to a histogram, but the original data is still available.

Example
Make a stem-and-leaf plot for:

5	10	7	19	25	12	15	7	6	8
17	17	22	21	7	7	24	5	6	5

0	5	7	7	6	8	7	7	5	6	5
1	0	9	2	5	7	7				
2	5	2	1	4						

We could also sort the leaves to get the plot:

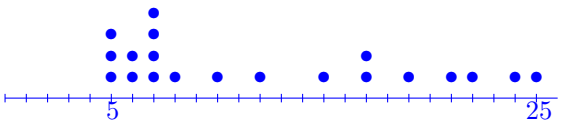
0	5	5	5	6	6	7	7	7	7	8
1	0	2	5	7	7	9				
2	1	2	4	5						

You could also make a stem-and-leaf plot with different increments, such as 5 instead of 10.

2 Dot Plot

In a **dot plot**, each data point is plotted using a point above a horizontal axis.

Example
Sketch a dot plot for the above data.



3 Pie Chart

Pie charts are used to represent qualitative data. A **pie chart** is a circle with "slices" whose area is proportional to the category represented in the slice.

Example
Construct a pie chart for the following data:
Causes for lateness:

Cause	Frequency
Snoozing after alarm goes off	19
Car trouble	5
Too long over breakfast	13
Last-minute studying	20
Finding something to wear	8
Talking too long with roommate	9
Other	3

Done in class

4 Pareto Chart

Pareto charts are used to represent qualitative data. A **Pareto chart** is a vertical bar graph in which the height of each bar represents either the frequency or the relative frequency. The bars are arranged in decreasing order from left to right. Gaps are used between the bars.

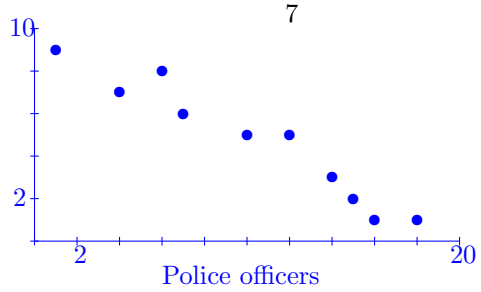
Example
Construct a Pareto chart for the above data.
Done in class

5 Scatter Plot

A **scatter plot** is used when we have paired data with both coordinates being quantitative values. This is commonly used when we have 2 variables that are measured at once. We plot the points as we would points on the coordinate axis.

Example
Construct a scatter plot for the following data:

Number of officers on duty in a Boston city park	Number of muggings that day
10	5
15	2
16	1
1	9
4	7
6	8
18	1
12	5
14	3
7	6



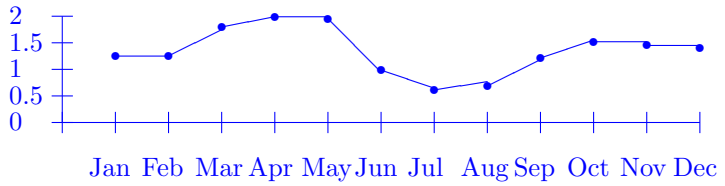
(the vertical axis represents muggings)

6 Time Series Chart

When one of the variables for a scatter plot is time and data is taken at regular intervals over a period of time, we connect the points with a line segments. The special name for this is a **time series chart**.

Example
Construct a time series chart for Salt Lake City's average monthly precipitation (in inches):

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Precipitation	1.25	1.25	1.79	1.99	1.95	0.98	0.61	0.69	1.21	1.52	1.45	1.41



Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Month
(the vertical axis represents the amount of precipitation in inches)

7 Differences between the displays

For quantitative data:

Display	Pros	Cons
Frequency distribution	Easy to interpret	Original data not recoverable Not used often
Histogram	Easy to interpret	Original data not recoverable
Ogive	Good when cumulative data is wanted	Original data not recoverable Not used often
Stem-and-Leaf Plots	Original data available Easy to sort data	Not as easy to interpret as histograms
Dot Plot	Original data available Data already sorted Easier to find "unusual" numbers in data	Not as easy to interpret as histograms

For qualitative data:

Display	Pros	Cons
Pie Chart	Easy to interpret	Difficult to make accurately by hand Must be well labeled
Pareto Chart	Easy to interpret Easy to make by hand	Can be difficult to find a specific bar