Lecture 9

Functions
Announcements
Histogram Review
By default, `hist` uses a scale (`normed=True`) that ensures the area of the chart sums to 100%

- The area of each bar is a percentage of the whole
- The horizontal axis is a number line (e.g., years), and the bins sizes don’t have to be equal to each other
- The vertical axis is a density (e.g., percent per year)

(Demo)
Discussion Question

This histogram describes a **year** of daily temperatures. Answer these questions, if possible:

- What proportion of days had a high temp in the range 60-70?
- What proportion had a low of 45 or more?
- How many days had a difference of more than 20 degrees between their high & low temperatures?
Defining Functions
User-defined functions give names to blocks of code

```
def spread(values):
    return max(values) - min(values)
```

(Demo)
Discussion Question

What does this function do? What kind of input does it take? What output will it give? What's a reasonable name?

def f(s):
    return np.round(s / sum(s) * 100, 2)

(Demo)
The **apply** method creates an array by calling a function on every element in input column(s)

- First argument: Function to apply
- Other arguments: The input column(s)

```
table_name.apply(function_name, 'column_label')
```

(Demo)
Example: Prediction
Sir Francis Galton

- 1822 - 1911 (knighted in 1909)
- A pioneer in making predictions
- Particular (and troublesome) interest in heredity
- Charles Darwin's half-cousin (Demo)