Lecture 22: Applications of Dictionaries; Plotting with Matplotlib
Consider CSV data of the form:

alabama,10,20,30
alaska,32,43,56
.
.
.
Wyoming,2,0,78

Write a function to_data that takes a filename and returns a dictionary data where each key is a state name and each value is a list of integers.

>>> data["Minnesota"]
[47, 156, 107, 193, 121, 128]
>>> data["Iowa"]
[15, 36, 52, 57, 62, 45]
```python
import csv

def data_from_file(filename):
    with open(filename) as fin:
        return {
            state: [int(x) for x in nums]
            for state, *nums in csv.reader(fin)
        }
```
```python
def plot1(data, states, years):
    for state in states:
        plt.plot(years, data[state], label=state)
    plt.legend(loc="best")
    plt.xlabel("Year")
    plt.ylabel("No. Students Taking CS AP Exam")
    plt.title("No. Students Taking CS AP Exam by Year")
    plt.savefig("out.png")
```
def plot2(data, states, years):
    colors = plt.cm.Paired(np.linspace(0,1,len(states)))
    patches = []
    for state, c in zip(states, colors):
        plt.fill_between(years, data[state], color=c, alpha=0.5)
        patches.append(mpatches.Patch(color=c, label=state))
    plt.legend(handles=patches, loc="upper left")
    plt.xlabel("Year")
    plt.ylabel("No. Students Taking CS AP Exam")
    plt.title("No. Students Taking CS AP Exam by Year")
    plt.savefig("out2.png")
```python
def plot3(data, states, years):
    colors = plt.cm.Set1(np.linspace(0, 1, len(states)))
    for i, state, c in zip(count(), states, colors):
        ax = plt.subplot2grid((len(states), 1), (i, 0))
        ax.fill_between(years, data[state], color=c)
        ax.set_ylabel("Count")
        for tick in ax.yaxis.get_major_ticks():
            tick.label.set_fontsize(8)

    plt.tight_layout()
    plt.xlabel("Year")
    plt.savefig("out3.png")
```

```