

Lecture 23: Plotting with Matplotlib

Consider CSV data of the form:

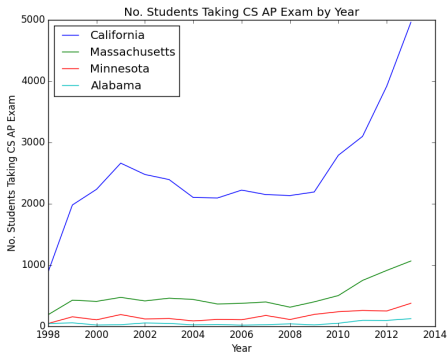
```
alabama,10,20,30  
alaska,32,43,56  
.  
.  
.  
Wyoming,2,0,78
```

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]
```

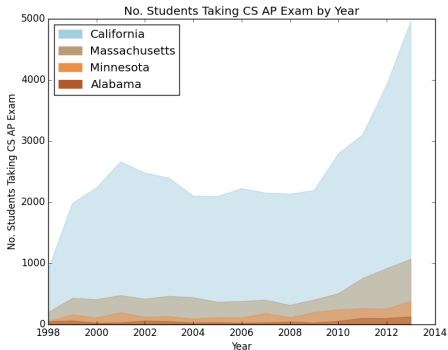
Simple Line Plots

```
1 def plot1(data, states, years):  
2     for state in states:  
3         plt.plot(years, data[state], label=state)  
4     plt.legend(loc="best")  
5     plt.xlabel("Year")  
6     plt.ylabel("No. Students Taking CS AP Exam")  
7     plt.title("No. Students Taking CS AP Exam by Year")  
8     plt.savefig("out.png")
```



Filled Plots

```
1 def plot2(data, states, years):
2     colors = plt.cm.Paired(np.linspace(0,1,len(states)))
3     patches = []
4     for state,c in zip(states,colors):
5         plt.fill_between(years, data[state], color=c, alpha=0.5)
6         patches.append(mpatches.Patch(color=c, label=state))
7     plt.legend(handles=patches, loc="upper left")
8     plt.xlabel("Year")
9     plt.ylabel("No. Students Taking CS AP Exam")
10    plt.title("No. Students Taking CS AP Exam by Year")
11    plt.savefig("out2.png")
```



Subplots

```
1 def plot3(data, states, years):
2     colors = plt.cm.Set1(np.linspace(0,1,len(states)))
3     for i, state, c in zip(count(), states, colors):
4         ax = plt.subplot2grid((len(states),1),(i,0))
5         ax.fill_between(years, data[state], color=c)
6         ax.set_ylabel("Count")
7         for tick in ax.yaxis.get_major_ticks():
8             tick.label.set_fontsize(8)
9
10    plt.tight_layout()
11    plt.xlabel("Year")
12    plt.savefig("out3.png")
```

