Day 2 Activities: Modular Programming

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Activity 1: Sales Tax

Write a program, which incorporate the technique of modular programming, to calculate the sales tax for an item price.

1. Read in the file "state_sales_tax.txt" which contains the state abbreviations (column 1) and their associated minimum sales tax (column 2). Store each column into a list. Convert the tax_rate list into a numpy array with the numpy function asarray(). Since you haven't learned how to read in files yet there is some sample code to follow in figure 1.

2. Write a function that returns the average value of an array. Use this function to compute the average sales tax of the US and print out this value.

3. In your main program, prompt the user to input a state abbreviation and an item price.

4. Write a function that checks to make sure the user inputted a correct state abbreviation, this function should return a boolean. If this routine returns false prompt the user to input a state abbreviation again.

5. Write additional functions that return (1) the associated tax rate for that state, (2) computes and returns the sales tax for the item, and (3) computes and returns the total cost.

6. In your main program, call these functions and print out the results for each of your functions.

7. If there is time: Generalize steps 5 and 6 to use iteration for the user to input as many states and item prices as possible.

```python
#Open file to read
f = open('state_sales_tax.txt', 'r')

for line in f:
    #Add state to list
    states.append(line[:2])
    #Get tax rate for state and remove newline character
    tax = line[3:]
    tax = tax[:-1]
    #Append to tax_rates list and
    tax_rates.append(float(tax))
    print line

#close file
f.close()
```

Fig. 1.— Sample code for reading in text file and putting data into lists.