

CSE 5544 Lab 3  
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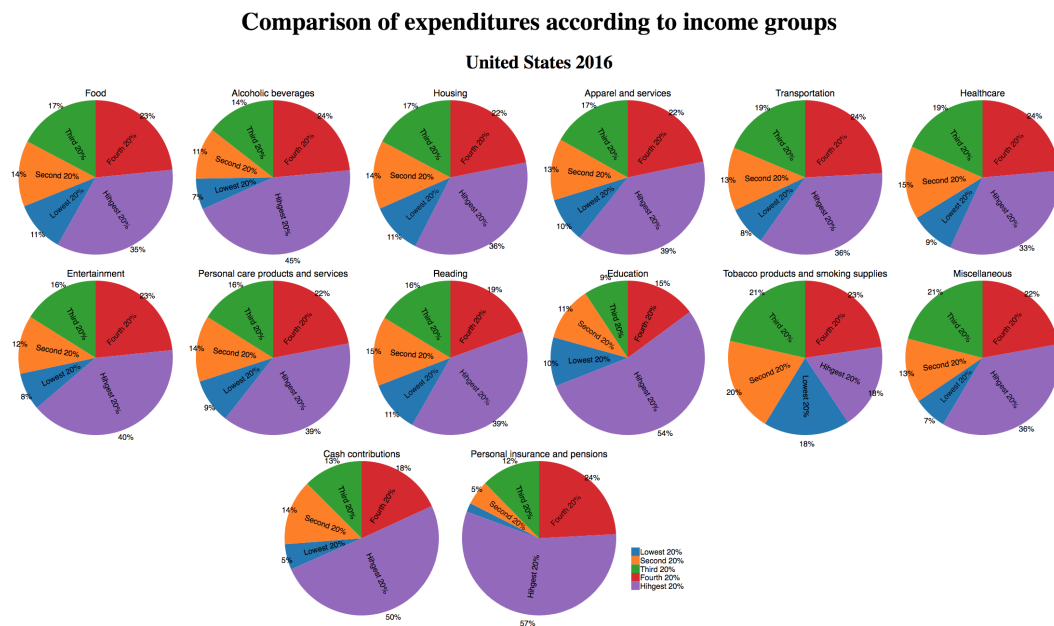
1. Examine the file and find out the top level expenditure categories based on indentation. What are the top level spending categories?

Based on indentation, the top level expenditure categories: Food, Alcoholic beverages, Housing, Apparel and services, Transportation, Healthcare, Entertainment, Personal care products and services, Reading, Education, Tobacco products and smoking supplies, Miscellaneous, Cash contributions, Personal insurance and pensions.

2. For each of the top level expenditure categories, calculate the total expenditure and then the percentage of expenditure from each of the five income groups.  
For this question, I used Python and Pandas to process the data and get the following table.

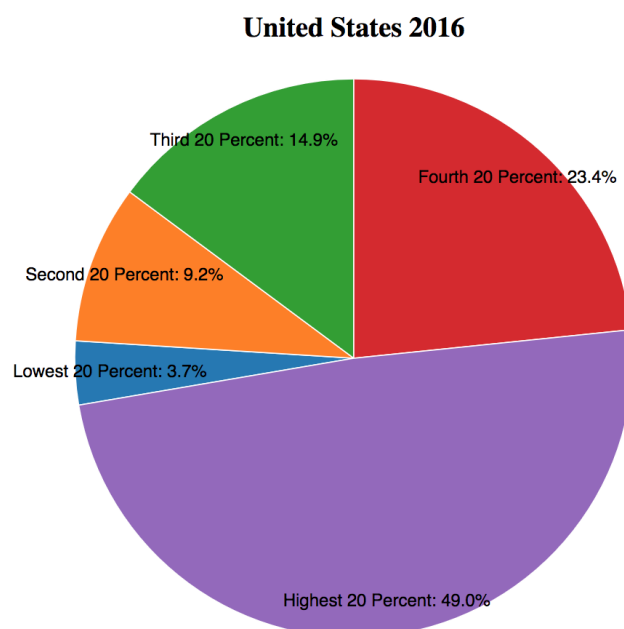
Expenditure	total	Lowest 20 percentage	Second 20 percentage	Third 20 percentage	Fourth 20 percentage	Highest 20 percentage
Food	36012.79	10.72%	13.82%	17.28%	23.42%	34.75%
Alcoholic beverages	2419.33	6.52%	10.78%	14.46%	23.51%	44.72%
Housing	94474.65	10.87%	14.34%	17.27%	21.90%	35.62%
Apparel and services	9013.71	9.55%	12.91%	16.85%	21.74%	38.96%
Transportation	45268.95	8.32%	13.24%	18.70%	24.15%	35.60%
Healthcare	23068.35	9.34%	15.29%	18.49%	23.59%	33.28%
Entertainment	14570.35	7.87%	12.24%	16.09%	23.40%	40.41%
Personal care products and services	3534.32	9.43%	13.86%	16.11%	22.00%	38.60%
Reading	589.65	10.92%	14.53%	16.32%	19.45%	38.78%
Education	6650.78	10.24%	11.41%	9.29%	14.86%	54.20%
Tobacco products and smoking supplies	1685.98	18.06%	19.86%	21.45%	22.69%	17.94%
Miscellaneous	4799.85	6.99%	13.46%	21.00%	22.13%	36.41%
Cash contributions	10413.5	5.36%	13.74%	12.50%	18.15%	50.25%
Personal insurance and pensions	34202.17	1.88%	5.16%	12.36%	24.16%	56.44%

- Using D3 to re-produce a visualization similar to what we discuss in class, as shown below, but you do not need to expand the slice that has the largest portion as in the picture. Just regular piechart will do.



- Based on the after tax income, calculate the percentage for each of the five income group. Create a pie chart that show the income percentages using D3

### Percentage of the five income groups for after tax income

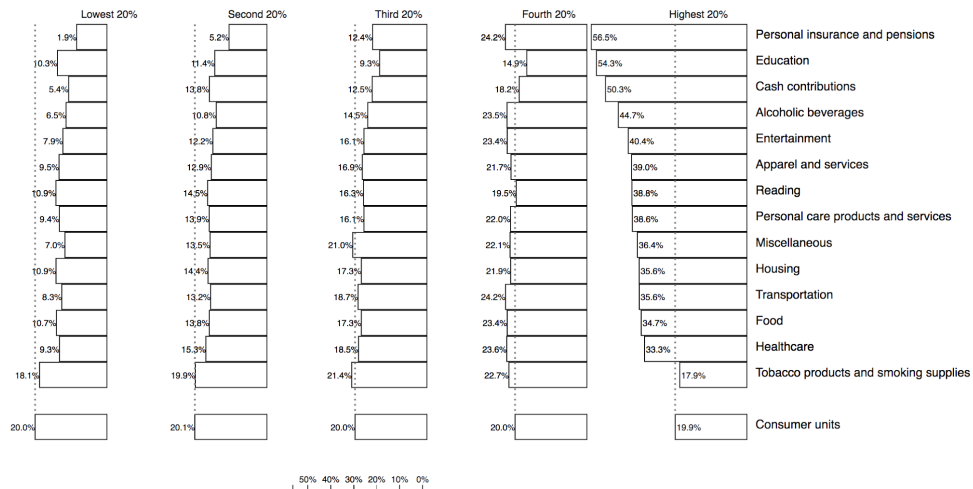


- Generate a visualization similar to what we discuss in class using D3, as shown below. The dashline for the consumer units is shown in the graph.

## Expenditure percentage for five income groups

United States 2016

Income Groups



6. Now, for each of the five income groups, draw a barchart to track the top 50 expenditures. Allow mouse over the bars to show the name of the spending items

For this question, I first used Pandas to process the data and get the top 50 expenditures.

After choosing from the menu, we can choose to see the bar chart for different groups and when you click on each bar, the name and percentage for the expenditure is shown.

## Top 50 expenditures for the lowest 20% group

