

Automated Document Generation Using RMarkdown

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What is RMarkdown?

- Variation of R designed to generate HTML, PDF, and Word documents
- Easy to incorporate code and figures
- Create highly specified templates
- Adaptable to loops

Layout

- Three types of environment
 1. **Preamble:** set template, title, author, and formats
 2. **R Chunk:** runs R codes and displays results in document
 3. **Text:** body text, headers, bullets, and lists

```
1 ---
2 title: "State SNAP Summary"
3 output: word_document
4 prettydoc: html_pretty:
5   theme: architect
6   highlight: github
7 ---
```

```
8
9 # `r state`
```

```
10
11 ```{r, echo=FALSE}
12 plot_usmap(include = c(abbrev))
13
14 ```
```

```
15
16
17
18 The Supplemental Nutrition Assistance Program (SNAP) serves as the foundation of America's nutrition assistance safety net. It is the nation's first line of defense against food insecurity and offers a powerful tool to improve nutrition among low-income individuals. SNAP is the largest of the domestic nutrition assistance programs administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA). This memo describes the characteristics of SNAP households and participants nationwide in fiscal year 2016 (October 2015 through September 2016) within `r state` .
19
```

Inserting Data to the Text

Rmarkdown Code

```
During fiscal year 2016, SNAP provided benefits to approximately `r as.numeric(B1_data[B1_data$State== state, 2])` thousand people living in `r as.numeric(B1_data[B1_data$State== state, 4])` thousand households each month across `r state`. The total cost of the program in fiscal year 2016 was `r B1_data[B1_data$State== state, 6]` thousand.

## Income Summary

Below are the summary income values for `r state`, for SNAP participants in the fiscal year of 2016.

* Mean Household Size: `r B2_data[B2_data$State== state, 7]`
* Gross Countable Income: `r B2_data[B2_data$State== state, 3]`
  + Gross Income as a Percentage of Poverty Guideline: `r B2_data[B2_data$State== state, 2]`
* Net Countable Income: `r B2_data[B2_data$State== state, 4]`
* Mean SNAP Benefit Value: `r B2_data[B2_data$State== state, 6]`
```

Document Output

During fiscal year 2016, SNAP provided benefits to approximately 397 thousand people living in 844 thousand households each month across Alabama. The total cost of the program in fiscal year 2016 was 101,759 thousand.

Income Summary

Below are the summary income values for Alabama for SNAP participants in the fiscal year of 2016.

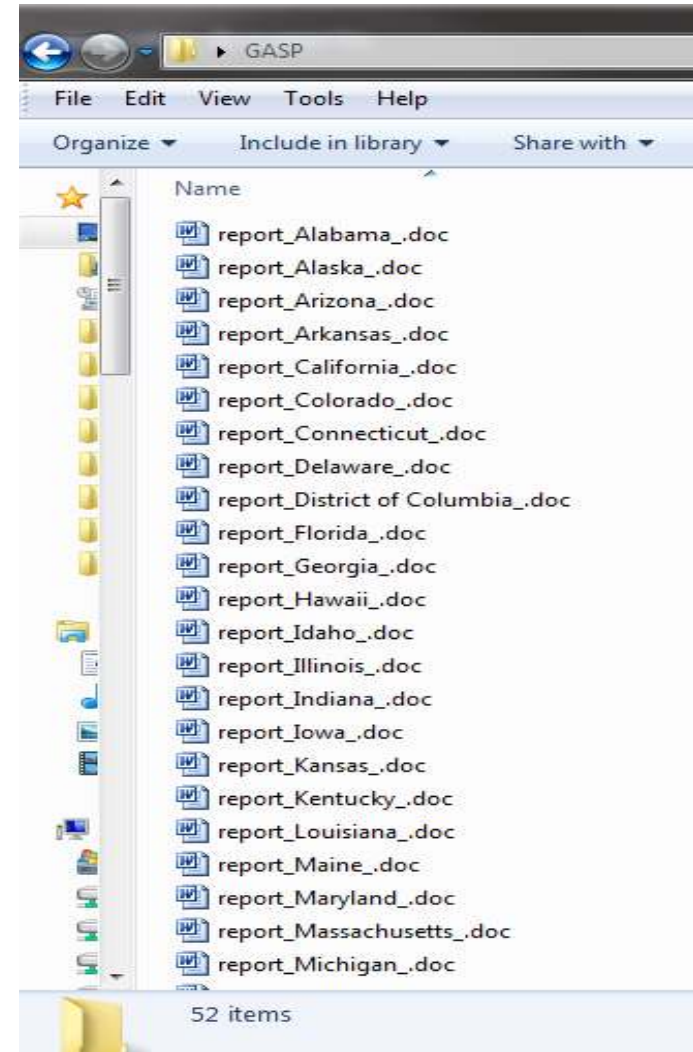
- Mean Household Size: 2.1
- Gross Countable Income: 756
 - Gross Income as a Percentage of Poverty Guideline: 55.5
- Net Countable Income: 381
- Mean SNAP Benefit Value: 256

Generating Multiple Documents

```
1 #-----
2 #FIRST: load all packages required to generate documents
3 #-----
4
5 library(usmap)
6 library(ggplot2)
7 library(readxl)
8 library(knitr)
9 library(markdown)
10 library(rmarkdown)
11
12 #-----
13 #SECOND: read in the data used in reports
14 #-----
15
16 SL <- read_excel('C:/Users/ebudge/Desktop/allstates.xlsx')
17
18 B1_data <- read_excel('C:/Users/ebudge/Desktop/GASP tables.xlsx',sheet = 1)
19 B2_data <- read_excel('C:/Users/ebudge/Desktop/GASP tables.xlsx',sheet = 2)
20 B3_data <- read_excel('C:/Users/ebudge/Desktop/GASP tables.xlsx',sheet = 3)
21 B4_data <- read_excel('C:/Users/ebudge/Desktop/GASP tables.xlsx',sheet = 4)
22
23 #-----
24 #THIRD: run the markdown code for each state
25 #-----
26
27 for(sa in 1:52){
28
29     state = SL$Statename[sa]
30     abbrev = SL$Postal[sa]
31
32     rmarkdown::render('C:/Users/ebudge/Desktop/gasp test 3.Rmd', # file 2
33                       output_file = paste("report_", state, "_", ".doc", sep=''),
34                       output_dir = 'C:/Users/ebudge/Desktop/GASP')
35 }
36
37
```

Output

- One document for each of the states
- Every document contains the same language, figures, and formats
- All values are state specific and accurate



Output

State SNAP Summary

Alabama



The Supplemental Nutrition Assistance Program (SNAP) serves as the foundation of America's nutrition assistance safety net. It is the nation's first line of defense against food insecurity and offers a powerful tool to improve nutrition among low-income individuals. SNAP is the largest of the domestic nutrition assistance programs administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA). This memo describes the characteristics of SNAP households and participants nationwide in fiscal year 2016 (October 2015 through September 2016) within Alabama.

During fiscal year 2016, SNAP provided benefits to approximately 397 thousand people living in 844 thousand households each month across Alabama. The total cost of the program in fiscal year 2016 was 101,759 thousand.

Income Summary

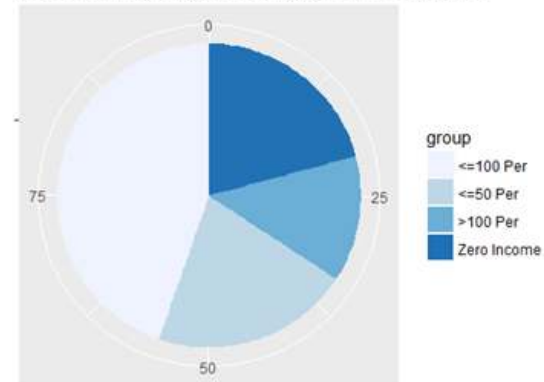
Below are the summary income values for Alabama, for SNAP participants in the fiscal year of 2016.

- Mean Household Size: 2.1

- Gross Countable Income: 756
 - Gross Income as a Percentage of Poverty Guideline: 55.5
- Net Countable Income: 381
- Mean SNAP Benefit Value: 256

SNAP is aimed at helping households in need, particularly those with incomes below the poverty line. In Alabama, The majority of SNAP participants are below 100 percent of the poverty guideline. The figure below shows the breakdown of participants by their percentage of the poverty level.

State Population by Percentage of Poverty Level



Output

State SNAP Summary

California



The Supplemental Nutrition Assistance Program (SNAP) serves as the foundation of America's nutrition assistance safety net. It is the nation's first line of defense against food insecurity and offers a powerful tool to improve nutrition among low-income individuals. SNAP is the largest of the domestic nutrition assistance programs administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA). This memo describes the characteristics of SNAP households and participants nationwide in fiscal year 2016 (October 2015 through September 2016) within California.

During fiscal year 2016, SNAP provided benefits to approximately 2060 thousand people living in 4261 thousand households each month across California. The total cost of the program in fiscal year 2016 was \$578,011 thousand.

Income Summary

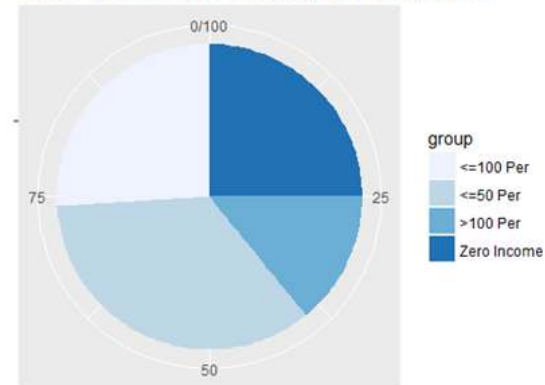
Below are the summary income values for California, for SNAP participants in the fiscal year of 2016.

- Mean Household Size: 2.1

- Gross Countable Income: 707
 - Gross Income as a Percentage of Poverty Guideline: 49.3
- Net Countable Income: 283
- Mean SNAP Benefit Value: 281

SNAP is aimed at helping households in need, particularly those with incomes below the poverty line. In California, The majority of SNAP participants are below 100 percent of the poverty guideline. The figure below shows the breakdown of participants by their percentage of the overy level.

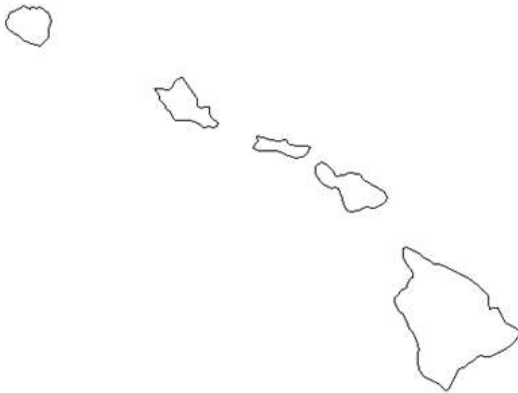
State Population by Percentage of Poverty Level



Output

State SNAP Summary

Hawaii



The Supplemental Nutrition Assistance Program (SNAP) serves as the foundation of America's nutrition assistance safety net. It is the nation's first line of defense against food insecurity and offers a powerful tool to improve nutrition among low-income individuals. SNAP is the largest of the domestic nutrition assistance programs administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA). This memo describes the characteristics of SNAP households and participants nationwide in fiscal year 2016 (October 2015 through September 2016) within Hawaii.

During fiscal year 2016, SNAP provided benefits to approximately 89 thousand people living in 175 thousand households each month across Hawaii. The total cost of the program in fiscal year 2016 was \$39,328 thousand.

Income Summary

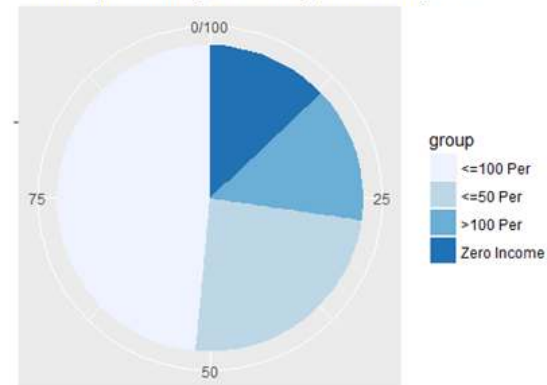
Below are the summary income values for Hawaii, for SNAP participants in the fiscal year of 2016.

- Mean Household Size: 2

- Gross Countable Income: 951
 - Gross Income as a Percentage of Poverty Guideline: 60.3
- Net Countable Income: 533
- Mean SNAP Benefit Value: 444

SNAP is aimed at helping households in need, particularly those with incomes below the poverty line. In Hawaii, The majority of SNAP participants are below 100 percent of the poverty guideline. The figure below shows the breakdown of participants by their percentage of the overy level.

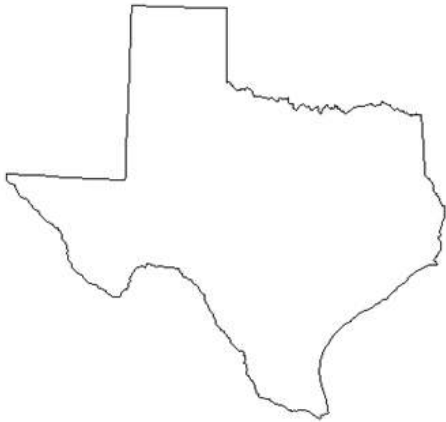
State Population by Percentage of Poverty Level



Output

State SNAP Summary

Texas



The Supplemental Nutrition Assistance Program (SNAP) serves as the foundation of America's nutrition assistance safety net. It is the nation's first line of defense against food insecurity and offers a powerful tool to improve nutrition among low-income individuals. SNAP is the largest of the domestic nutrition assistance programs administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA). This memo describes the characteristics of SNAP households and participants nationwide in fiscal year 2016 (October 2015 through September 2016) within Texas.

During fiscal year 2016, SNAP provided benefits to approximately 1576 thousand people living in 3732 thousand households each month across Texas. The total cost of the program in fiscal year 2016 was \$436,941 thousand.

Income Summary

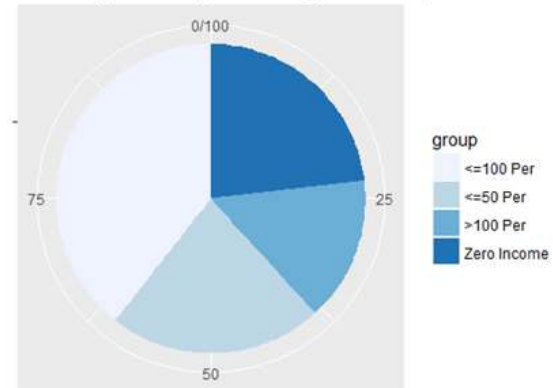
Below are the summary income values for Texas, for SNAP participants in the fiscal year of 2016.

- Mean Household Size: 2.4

- Gross Countable Income: 813
 - Gross Income as a Percentage of Poverty Guideline: 54.6
- Net Countable Income: 428
- Mean SNAP Benefit Value: 277

SNAP is aimed at helping households in need, particularly those with incomes below the poverty line. In Texas, The majority of SNAP participants are below 100 percent of the poverty guideline. The figure below shows the breakdown of participants by their percentage of the poverty level.

State Population by Percentage of Poverty Level



Resources

- RMarkdown Basics:
 - <https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf>
 - <https://bookdown.org/yihui/rmarkdown/>
- Templates:
 - https://rmarkdown.rstudio.com/developer_document_templates
 - <http://jianghao.wang/post/2017-12-08-rmarkdown-templates/>
- SNAP Data Used:
 - U.S. Department of Agriculture, Food and Nutrition Service, Office of Policy Support, *Characteristics of Supplemental Nutrition Assistance Program Households: Fiscal Year 2016*, by Sarah Lauffer. Project Officer, Jenny Genser. Alexandria, VA, 2017. Appendix B, Tables B1 through B4. <https://fns-prod.azureedge.net/sites/default/files/ops/Characteristics2016.pdf>
- Download R and Rstudio:
 - <https://www.r-project.org/>
 - <https://www.rstudio.com/>

Any Questions?

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