

Lab webscraping 2

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1 a} Show and use a census API key that gives you access to the Census Bureau data. Do not use my API key, use and show your own key.

```
census_api_key("4009f73e21670e9fb8801c8067991ecb855c1632", overwrite=TRUE)

## To install your API key for use in future sessions, run this function with `install = TRUE`.
census_api_key("4009f73e21670e9fb8801c8067991ecb855c1632", install=FALSE)

## To install your API key for use in future sessions, run this function with `install = TRUE`.
```

b) Using the link provided in your notes, secure a Census Bureau API key. Run the census code that requires usage of the API key and then use R coding to produce a table that shows the totals for Asian Males for ages 67 to 69 by state for the year 2000. The identifier code is P012D021

```
age6769 <- get_decennial(geography = "state",
                        variables = "P012D021",
                        year = 2000)
```

```
## Getting data from the 2000 decennial Census
```

```
## Using Census Summary File 1
```

```
age6769
```

```
## # A tibble: 52 x 4
##   GEOID NAME          variable value
##   <chr> <chr>          <chr>    <dbl>
## 1 01    Alabama        P012D021  118
## 2 02    Alaska          P012D021  118
## 3 04    Arizona           P012D021  547
## 4 05    Arkansas          P012D021   98
## 5 06    California        P012D021 28524
## 6 08    Colorado          P012D021  479
## 7 09    Connecticut        P012D021  391
## 8 10    Delaware          P012D021   80
## 9 11    District of Columbia P012D021   81
```

```
## 10 12 Florida P012D021 1601
## # ... with 42 more rows
```

c) Show and use R code to find the mean, median, ,max, min, Q1, and Q3 for the median ages.

```
mean(age6769$value)

## [1] 1299.192

median(age6769$value)

## [1] 227

which.max(age6769$value) # the row

## [1] 5

which.min(age6769$value) # the row

## [1] 42

IQR(age6769$value)

## [1] 664.25

summary(age6769$value)

##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.
##    15.00    80.75    227.00   1299.19   745.00  28524.00
```

d) Show and use R code (tidyverse/dplyr) coding to find the top ten states with highest populations of Asian Males whose ages are between 67 and 69.

```
age6769 %>%
  arrange(desc(value)) -> top10
head(top10,10)

## # A tibble: 10 x 4
##   GEOID NAME      variable value
##   <chr> <chr>      <chr>    <dbl>
## 1 06 California P012D021 28524
## 2 36 New York   P012D021 7044
## 3 15 Hawaii     P012D021 6478
## 4 48 Texas      P012D021 2685
## 5 34 New Jersey P012D021 2494
## 6 17 Illinois   P012D021 2294
## 7 53 Washington P012D021 1856
## 8 12 Florida    P012D021 1601
## 9 51 Virginia   P012D021 1443
## 10 24 Maryland  P012D021 1437
```

2 a) Using the link provided in your notes, use and show R coding to produce a table that shows the median ages for Hispanic or Latino women for the year 2010 (Hint: the 8 character variable code starts with characters P013. Search in your table to get the other four characters. (Hint: Ctrl F speeds up the search process))

```
year2010 <- get_decennial(geography = "state",
                          variables = "P013H003",
                          year = 2010)
```

```
## Getting data from the 2010 decennial Census
```

```
## Using Census Summary File 1
```

```
year2010
```

```
## # A tibble: 52 x 4
##   GEOID NAME      variable value
##   <chr> <chr>      <chr>    <dbl>
## 1 01 Alabama P013H003 23.7
## 2 02 Alaska P013H003 24.7
## 3 04 Arizona P013H003 26
## 4 05 Arkansas P013H003 22.7
## 5 06 California P013H003 27.7
## 6 22 Louisiana P013H003 28.8
## 7 21 Kentucky P013H003 23.1
## 8 08 Colorado P013H003 26.8
## 9 09 Connecticut P013H003 28.4
## 10 10 Delaware P013H003 24.7
## # ... with 42 more rows
```

b) Show and use R code to find the mean, median, ,max, min, Q1, and Q3 for the median ages.

```
mean(year2010$value)
```

```
## [1] 25.63077
```

```
median(year2010$value)
```

```
## [1] 24.85
```

```
which.max(year2010$value) # the row
```

```
## [1] 52
```

```
which.min(year2010$value) # the row
```

```
## [1] 42
```

```
IQR(year2010$value)
```

```
## [1] 3.575
```

```
summary(year2010$value)
```

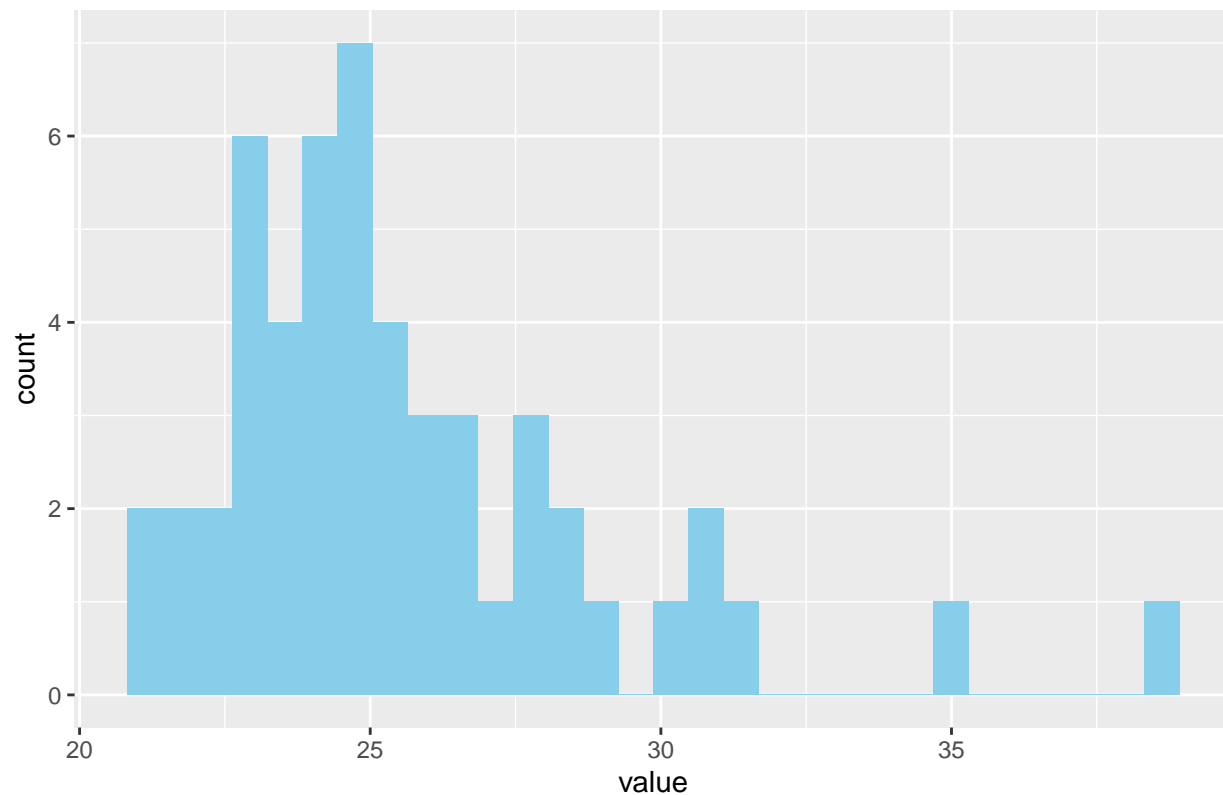
```
##      Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##      21.10  23.38   24.85   25.63  26.95   38.60
```

c) Use ggplot coding to produce a Histogram of vertical orientation for the median ages for the table that you produced for 2a.

```
ggplot(year2010, mapping=aes(x=value))+
  geom_histogram(fill="sky blue")+
  ggtitle("Histogram of median ages for Hispanic or Latino women for the year 2010")
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

Histogram of median ages for Hispanic or Latino women for the year 2010



```
theme_bw()
```

```
## List of 93
## $ line :List of 6
## ..$ colour : chr "black"
## ..$ size : num 0.5
## ..$ linetype : num 1
## ..$ lineend : chr "butt"
## ..$ arrow : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ rect :List of 5
```

```

## ..$ fill          : chr "white"
## ..$ colour        : chr "black"
## ..$ size          : num 0.5
## ..$ linetype       : num 1
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ text              :List of 11
## ..$ family         : chr ""
## ..$ face           : chr "plain"
## ..$ colour         : chr "black"
## ..$ size           : num 11
## ..$ hjust          : num 0.5
## ..$ vjust          : num 0.5
## ..$ angle          : num 0
## ..$ lineheight     : num 0.9
## ..$ margin         : 'margin' num [1:4] 0points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ title             : NULL
## $ aspect.ratio      : NULL
## $ axis.title         : NULL
## $ axis.title.x       :List of 11
## ..$ family         : NULL
## ..$ face           : NULL
## ..$ colour         : NULL
## ..$ size           : NULL
## ..$ hjust          : NULL
## ..$ vjust          : num 1
## ..$ angle          : NULL
## ..$ lineheight     : NULL
## ..$ margin         : 'margin' num [1:4] 2.75points 0points 0points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.top   :List of 11
## ..$ family         : NULL
## ..$ face           : NULL
## ..$ colour         : NULL
## ..$ size           : NULL
## ..$ hjust          : NULL
## ..$ vjust          : num 0
## ..$ angle          : NULL
## ..$ lineheight     : NULL
## ..$ margin         : 'margin' num [1:4] 0points 0points 2.75points 0points
## ..- attr(*, "unit")= int 8
## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.x.bottom : NULL
## $ axis.title.y        :List of 11
## ..$ family         : NULL

```

```

## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : NULL
## ..$ vjust         : num 1
## ..$ angle         : num 90
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 2.75points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.title.y.left      : NULL
## $ axis.title.y.right     :List of 11
## ..$ family         : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : NULL
## ..$ vjust         : num 0
## ..$ angle         : num -90
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 0points 0points 0points 2.75points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text            :List of 11
## ..$ family         : NULL
## ..$ face          : NULL
## ..$ colour        : chr "grey30"
## ..$ size          : 'rel' num 0.8
## ..$ hjust         : NULL
## ..$ vjust         : NULL
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : NULL
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x          :List of 11
## ..$ family         : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : NULL
## ..$ hjust         : NULL
## ..$ vjust         : num 1
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : 'margin' num [1:4] 2.2points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"

```

```

## $ axis.text.x.top           :List of 11
## ..$ family                 : NULL
## ..$ face                   : NULL
## ..$ colour                 : NULL
## ..$ size                   : NULL
## ..$ hjust                  : NULL
## ..$ vjust                  : num 0
## ..$ angle                  : NULL
## ..$ lineheight             : NULL
## ..$ margin                 : 'margin' num [1:4] 0points 0points 2.2points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug                  : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.x.bottom       : NULL
## $ axis.text.y              :List of 11
## ..$ family                 : NULL
## ..$ face                   : NULL
## ..$ colour                 : NULL
## ..$ size                   : NULL
## ..$ hjust                  : num 1
## ..$ vjust                  : NULL
## ..$ angle                  : NULL
## ..$ lineheight             : NULL
## ..$ margin                 : 'margin' num [1:4] 0points 2.2points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug                  : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.text.y.left         : NULL
## $ axis.text.y.right        :List of 11
## ..$ family                 : NULL
## ..$ face                   : NULL
## ..$ colour                 : NULL
## ..$ size                   : NULL
## ..$ hjust                  : num 0
## ..$ vjust                  : NULL
## ..$ angle                  : NULL
## ..$ lineheight             : NULL
## ..$ margin                 : 'margin' num [1:4] 0points 0points 0points 2.2points
## .. ..- attr(*, "unit")= int 8
## ..$ debug                  : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ axis.ticks               :List of 6
## ..$ colour                 : chr "grey20"
## ..$ size                   : NULL
## ..$ linetype               : NULL
## ..$ lineend                : NULL
## ..$ arrow                  : logi FALSE
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_line" "element"
## $ axis.ticks.x             : NULL
## $ axis.ticks.x.top         : NULL

```

```

## $ axis.ticks.x.bottom      : NULL
## $ axis.ticks.y            : NULL
## $ axis.ticks.y.left       : NULL
## $ axis.ticks.y.right      : NULL
## $ axis.ticks.length        : 'simpleUnit' num 2.75points
##   .- attr(*, "unit")= int 8
## $ axis.ticks.length.x      : NULL
## $ axis.ticks.length.x.top  : NULL
## $ axis.ticks.length.x.bottom: NULL
## $ axis.ticks.length.y      : NULL
## $ axis.ticks.length.y.left : NULL
## $ axis.ticks.length.y.right: NULL
## $ axis.line                : list()
##   .- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ axis.line.x              : NULL
## $ axis.line.x.top          : NULL
## $ axis.line.x.bottom       : NULL
## $ axis.line.y              : NULL
## $ axis.line.y.left         : NULL
## $ axis.line.y.right        : NULL
## $ legend.background        :List of 5
##   ..$ fill                 : NULL
##   ..$ colour                : logi NA
##   ..$ size                  : NULL
##   ..$ linetype              : NULL
##   ..$ inherit.blank: logi TRUE
##   .- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ legend.margin            : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
##   .- attr(*, "unit")= int 8
## $ legend.spacing           : 'simpleUnit' num 11points
##   .- attr(*, "unit")= int 8
## $ legend.spacing.x         : NULL
## $ legend.spacing.y         : NULL
## $ legend.key                :List of 5
##   ..$ fill                 : chr "white"
##   ..$ colour                : logi NA
##   ..$ size                  : NULL
##   ..$ linetype              : NULL
##   ..$ inherit.blank: logi TRUE
##   .- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ legend.key.size          : 'simpleUnit' num 1.2lines
##   .- attr(*, "unit")= int 3
## $ legend.key.height        : NULL
## $ legend.key.width         : NULL
## $ legend.text               :List of 11
##   ..$ family               : NULL
##   ..$ face                  : NULL
##   ..$ colour                : NULL
##   ..$ size                  : 'rel' num 0.8
##   ..$ hjust                 : NULL
##   ..$ vjust                 : NULL
##   ..$ angle                 : NULL
##   ..$ lineheight            : NULL
##   ..$ margin                : NULL

```



```

## ..$ debug          : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ legend.text.align : NULL
## $ legend.title       :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : NULL
## ..$ size            : NULL
## ..$ hjust           : num 0
## ..$ vjust           : NULL
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : NULL
## ..$ debug           : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ legend.title.align : NULL
## $ legend.position    : chr "right"
## $ legend.direction   : NULL
## $ legend.justification : chr "center"
## $ legend.box         : NULL
## $ legend.box.just    : NULL
## $ legend.box.margin  : 'margin' num [1:4] 0cm 0cm 0cm 0cm
## ..- attr(*, "unit")= int 1
## $ legend.box.background : list()
## ..- attr(*, "class")= chr [1:2] "element_blank" "element"
## $ legend.box.spacing  : 'simpleUnit' num 11points
## ..- attr(*, "unit")= int 8
## $ panel.background    :List of 5
## ..$ fill              : chr "white"
## ..$ colour           : logi NA
## ..$ size             : NULL
## ..$ linetype         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ panel.border        :List of 5
## ..$ fill              : logi NA
## ..$ colour           : chr "grey20"
## ..$ size             : NULL
## ..$ linetype         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ panel.spacing      : 'simpleUnit' num 5.5points
## ..- attr(*, "unit")= int 8
## $ panel.spacing.x    : NULL
## $ panel.spacing.y    : NULL
## $ panel.grid         :List of 6
## ..$ colour          : chr "grey92"
## ..$ size            : NULL
## ..$ linetype        : NULL
## ..$ lineend         : NULL
## ..$ arrow           : logi FALSE
## ..$ inherit.blank: logi TRUE

```

```

##  .- attr(*, "class")= chr [1:2] "element_line" "element"
##  $ panel.grid.major          : NULL
##  $ panel.grid.minor         :List of 6
##  ..$ colour                 : NULL
##  ..$ size                   : 'rel' num 0.5
##  ..$ linetype               : NULL
##  ..$ lineend                : NULL
##  ..$ arrow                  : logi FALSE
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_line" "element"
##  $ panel.grid.major.x       : NULL
##  $ panel.grid.major.y       : NULL
##  $ panel.grid.minor.x       : NULL
##  $ panel.grid.minor.y       : NULL
##  $ panel.ontop               : logi FALSE
##  $ plot.background          :List of 5
##  ..$ fill                   : NULL
##  ..$ colour                 : chr "white"
##  ..$ size                   : NULL
##  ..$ linetype               : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_rect" "element"
##  $ plot.title                :List of 11
##  ..$ family                 : NULL
##  ..$ face                   : NULL
##  ..$ colour                 : NULL
##  ..$ size                   : 'rel' num 1.2
##  ..$ hjust                  : num 0
##  ..$ vjust                  : num 1
##  ..$ angle                  : NULL
##  ..$ lineheight             : NULL
##  ..$ margin                 : 'margin' num [1:4] 0points 0points 5.5points 0points
##  .. .- attr(*, "unit")= int 8
##  ..$ debug                  : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_text" "element"
##  $ plot.title.position       : chr "panel"
##  $ plot.subtitle             :List of 11
##  ..$ family                 : NULL
##  ..$ face                   : NULL
##  ..$ colour                 : NULL
##  ..$ size                   : NULL
##  ..$ hjust                  : num 0
##  ..$ vjust                  : num 1
##  ..$ angle                  : NULL
##  ..$ lineheight             : NULL
##  ..$ margin                 : 'margin' num [1:4] 0points 0points 5.5points 0points
##  .. .- attr(*, "unit")= int 8
##  ..$ debug                  : NULL
##  ..$ inherit.blank: logi TRUE
##  .- attr(*, "class")= chr [1:2] "element_text" "element"
##  $ plot.caption              :List of 11
##  ..$ family                 : NULL
##  ..$ face                   : NULL

```

```

## ..$ colour      : NULL
## ..$ size        : 'rel' num 0.8
## ..$ hjust       : num 1
## ..$ vjust       : num 1
## ..$ angle       : NULL
## ..$ lineheight   : NULL
## ..$ margin      : 'margin' num [1:4] 5.5points 0points 0points 0points
## .. ..- attr(*, "unit")= int 8
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.caption.position : chr "panel"
## $ plot.tag          :List of 11
## ..$ family        : NULL
## ..$ face          : NULL
## ..$ colour        : NULL
## ..$ size          : 'rel' num 1.2
## ..$ hjust         : num 0.5
## ..$ vjust         : num 0.5
## ..$ angle         : NULL
## ..$ lineheight    : NULL
## ..$ margin        : NULL
## ..$ debug         : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ plot.tag.position   : chr "topleft"
## $ plot.margin         : 'margin' num [1:4] 5.5points 5.5points 5.5points 5.5points
## ..- attr(*, "unit")= int 8
## $ strip.background    :List of 5
## ..$ fill             : chr "grey85"
## ..$ colour          : chr "grey20"
## ..$ size            : NULL
## ..$ linetype        : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_rect" "element"
## $ strip.background.x  : NULL
## $ strip.background.y  : NULL
## $ strip.placement     : chr "inside"
## $ strip.text          :List of 11
## ..$ family          : NULL
## ..$ face            : NULL
## ..$ colour          : chr "grey10"
## ..$ size            : 'rel' num 0.8
## ..$ hjust           : NULL
## ..$ vjust           : NULL
## ..$ angle           : NULL
## ..$ lineheight      : NULL
## ..$ margin          : 'margin' num [1:4] 4.4points 4.4points 4.4points 4.4points
## .. ..- attr(*, "unit")= int 8
## ..$ debug           : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.text.x        : NULL
## $ strip.text.y        :List of 11

```

```
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : NULL
## ..$ angle       : num -90
## ..$ lineheight  : NULL
## ..$ margin      : NULL
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## $ strip.switch.pad.grid : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.switch.pad.wrap : 'simpleUnit' num 2.75points
## ..- attr(*, "unit")= int 8
## $ strip.text.y.left     :List of 11
## ..$ family      : NULL
## ..$ face        : NULL
## ..$ colour      : NULL
## ..$ size        : NULL
## ..$ hjust       : NULL
## ..$ vjust       : NULL
## ..$ angle       : num 90
## ..$ lineheight  : NULL
## ..$ margin      : NULL
## ..$ debug       : NULL
## ..$ inherit.blank: logi TRUE
## ..- attr(*, "class")= chr [1:2] "element_text" "element"
## - attr(*, "class")= chr [1:2] "theme" "gg"
## - attr(*, "complete")= logi TRUE
## - attr(*, "validate")= logi TRUE
```

d) Produce a coding chunk using dplyr functions to generate a table that gives results for values that are greater than or equal to a median age of 25.

```
year2010 %>%
  filter(value>=25)->age25
age25
```

```
## # A tibble: 24 x 4
##   GEOID NAME          variable value
##   <chr> <chr>          <chr>    <dbl>
## 1 04 Arizona          P013H003 26
## 2 06 California        P013H003 27.7
## 3 22 Louisiana          P013H003 28.8
## 4 08 Colorado          P013H003 26.8
## 5 09 Connecticut        P013H003 28.4
## 6 11 District of Columbia P013H003 30.1
## 7 12 Florida            P013H003 35.1
## 8 15 Hawaii            P013H003 25.5
```

```
## 9 17    Illinois    P013H003 26.5
## 10 24    Maryland   P013H003 28.1
## # ... with 14 more rows
```