R Notebook

Code

This is an R Markdown (http://rmarkdown.rstudio.com) Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Ctrl+Shift+Enter*.

Hide

```
#Downloading Packages

install.packages("rgdal")
```

```
Installing package into 愀牶C:/Users/justi/OneDrive/Documents/R/win-library/4.0愀牷
(as 愀牶lib愀牷 is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/rgdal_1.5-23.zip'
Content type 'application/zip' length 42843394 bytes (40.9 MB)
downloaded 40.9 MB
```

```
package ‘rgdal’ successfully unpacked and MD5 sums checked
Error in install.packages : ERROR: failed to lock directory ‘C:\Users\justi\OneDrive\Documents\R
\win-library\4.0’ for modifying
Try removing ‘C:\Users\justi\OneDrive\Documents\R\win-library\4.0/00LOCK’
```

Hide

```
install.packages("sf")
```

```
Installing package into 愀牶C:/Users/justi/OneDrive/Documents/R/win-library/4.0愀牷
(as 愀牶lib愀牷 is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/sf_0.9-8.zip'
Content type 'application/zip' length 42680941 bytes (40.7 MB)
downloaded 40.7 MB
```

```
package ‘sf’ successfully unpacked and MD5 sums checked
Error in install.packages : ERROR: failed to lock directory ‘C:\Users\justi\OneDrive\Documents\R
\win-library\4.0’ for modifying
Try removing ‘C:\Users\justi\OneDrive\Documents\R\win-library\4.0/00LOCK’
```

Hide

```
install.packages("dplyr")
```

```
Installing package into 愀牶C:/Users/justi/OneDrive/Documents/R/win-library/4.0愀牷
(as 愀牶lib愀牷 is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/dplyr_1.0.5.zip'
Content type 'application/zip' length 1329234 bytes (1.3 MB)
downloaded 1.3 MB
```

```
package ‘dplyr’ successfully unpacked and MD5 sums checked
Error in install.packages : ERROR: failed to lock directory ‘C:\Users\justi\OneDrive\Documents\R
\win-library\4.0’ for modifying
Try removing ‘C:\Users\justi\OneDrive\Documents\R\win-library\4.0/00LOCK’
```

Hide

```
install.packages("tidyverse")
```

```
Installing package into 愀牶C:/Users/justi/OneDrive/Documents/R/win-library/4.0愀牷
(as 愀牶lib愀牷 is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/tidyverse_1.3.0.zip'
Content type 'application/zip' length 440005 bytes (429 KB)
downloaded 429 KB
```

```
package ‘tidyverse’ successfully unpacked and MD5 sums checked
Error in install.packages : ERROR: failed to lock directory ‘C:\Users\justi\OneDrive\Documents\R
\win-library\4.0’ for modifying
Try removing ‘C:\Users\justi\OneDrive\Documents\R\win-library\4.0/00LOCK’
```

Hide

```
install.packages("mapview")
```

```
Installing package into 愀牶C:/Users/justi/OneDrive/Documents/R/win-library/4.0愀牷
(as 愀牶lib愀牷 is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/mapview_2.9.0.zip'
Content type 'application/zip' length 2287036 bytes (2.2 MB)
downloaded 2.2 MB
```

```
package ‘mapview’ successfully unpacked and MD5 sums checked
Error in install.packages : ERROR: failed to lock directory ‘C:\Users\justi\OneDrive\Documents\R
\win-library\4.0’ for modifying
Try removing ‘C:\Users\justi\OneDrive\Documents\R\win-library\4.0/00LOCK’
```

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```
install.packages("janitor")
```

```
Installing package into 愀牶C:/Users/justi/OneDrive/Documents/R/win-library/4.0愀牷
(as 愀牶lib愀牷 is unspecified)
trying URL 'https://cran.rstudio.com/bin/windows/contrib/4.0/janitor_2.1.0.zip'
Content type 'application/zip' length 251750 bytes (245 KB)
downloaded 245 KB
```

```
package ‘janitor’ successfully unpacked and MD5 sums checked
Error in install.packages : ERROR: failed to lock directory ‘C:\Users\justi\OneDrive\Documents\R
\win-library\4.0’ for modifying
Try removing ‘C:\Users\justi\OneDrive\Documents\R\win-library\4.0/00LOCK’
```

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```
library(rgdal)
```

```
package 愀牶rgdal愀牷 was built under R version 4.0.4rgdal: version: 1.5-23, (SVN revision 1121)
Geospatial Data Abstraction Library extensions to R successfully loaded
Loaded GDAL runtime: GDAL 3.2.1, released 2020/12/29
Path to GDAL shared files: C:/Users/justi/OneDrive/Documents/R/win-library/4.0/rgdal/gdal
GDAL binary built with GEOS: TRUE
Loaded PROJ runtime: Rel. 7.2.1, January 1st, 2021, [PJ_VERSION: 721]
Path to PROJ shared files: C:/Users/justi/OneDrive/Documents/R/win-library/4.0/rgdal/proj
PROJ CDN enabled: FALSE
Linking to sp version:1.4-5
To mute warnings of possible GDAL/OSR exportToProj4() degradation,
use options("rgdal_show_exportToProj4_warnings"="none") before loading rgdal.
Overwritten PROJ_LIB was C:/Users/justi/OneDrive/Documents/R/win-library/4.0/rgdal/proj
```

Hide

```
library(sp)
library(dplyr)
```

```
package 愀牶dplyr愀牷 was built under R version 4.0.4
Attaching package: 愀牶dplyr愀牷

The following objects are masked from 愀牶package:stats愀牷:

    filter, lag

The following objects are masked from 愀牶package:base愀牷:

    intersect, setdiff, setequal, union
```

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```
library(devtools)
```

```
Loading required package: usethis
```

Hide

```
library(ggplot2)
library(sf)
```

```
package 愀牠sf愀牷 was built under R version 4.0.4Linking to GEOS 3.8.0, GDAL 3.0.4, PROJ 6.3.1
```

Hide

```
library(tidyverse)
```

```
package 愀牠tidyverse愀牷 was built under R version 4.0.4Registered S3 methods overwritten by 'db
plyr':
  method         from
  print.tbl_lazy
  print.tbl_sql
-- Attaching packages --------------------------------- tidyverse 1.3.0 --
v tibble  3.0.6     v purrr   0.3.4
v tidyr   1.1.2     v stringr 1.4.0
v readr   1.4.0     v forcats 0.5.1
-- Conflicts ------------------------------------ tidyverse_conflicts() --
x dplyr::filter() masks stats::filter()
x dplyr::lag()    masks stats::lag()
```

Hide

```
library(tidycensus)
```

```
package 愀牠tidycensus愀牷 was built under R version 4.0.4
```

Hide

```
library(mapview)
```

```
package 愀牠mapview愀牷 was built under R version 4.0.4Registered S3 method overwritten by 'htmlw
idgets':
  method           from
  print.htmlwidget tools:rstudio
```

Hide

```
library(stringr)
library(scales)
```

```
Attaching package: 'scales'

The following object is masked from 'package:purrr':

    discard

The following object is masked from 'package:readr':

    col_factor
```

Hide

```
library(janitor)
```

```
package 'janitor' was built under R version 4.0.4
Attaching package: 'janitor'

The following objects are masked from 'package:stats':

    chisq.test, fisher.test
```

Hide

```
library(readr)
```

Installing Census API Key

Hide

```
library(tidycensus)
options(tigris_class = "sf")
options(tigris_use_cache = TRUE)
census_api_key([redacted], overwrite = TRUE, install = TRUE)
```

```
Your original .Renviron will be backed up and stored in your R HOME directory if needed.
Your API key has been stored in your .Renviron and can be accessed by Sys.getenv("CENSUS_API_KE
Y").
To use now, restart R or run `readRenviron("~/.Renviron")`
```

```
[1] [redacted]
```

Hide

```
readRenviron("~/.Renviron")
```

Bringing Full Census Datalist into R

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```
acs_variable_list = load_variables(2019,"acs5", cache= TRUE)

write.csv(acs_variable_list,'acs_variable_list_2018.csv', row.names = FALSE)


v16 = load_variables(year = 2019, dataset = "acs5", cache = TRUE)

v16
```

name <chr>	label <chr>
B01001_001	Estimate!!Total:
B01001_002	Estimate!!Total:!!Male:
B01001_003	Estimate!!Total:!!Male:!!Under 5 years
B01001_004	Estimate!!Total:!!Male:!!5 to 9 years
B01001_005	Estimate!!Total:!!Male:!!10 to 14 years
B01001_006	Estimate!!Total:!!Male:!!15 to 17 years
B01001_007	Estimate!!Total:!!Male:!!18 and 19 years
B01001_008	Estimate!!Total:!!Male:!!20 years
B01001_009	Estimate!!Total:!!Male:!!21 years
B01001_010	Estimate!!Total:!!Male:!!22 to 24 years

1-10 of 27,040 rows | 1-2 of 3 columns Previous **1** 2 3 4 5 6 … 100 Next

Getting Census Data and Calculating Dissimilarity Index for Howard County

Hide

```
Howard_Countytractdata2019 = get_acs(geography = "tract", year=2019, state = "MD", survey="acs5"
, county = "Howard County",
                variables = c("Total Pop" = "B01003_001",
"Black Pop" = "B01001B_001",
                              "Black Inc" = "B19013B_001",
                              "White Pop" =    "B01001A_001",
                              "White Inc" = "B19013A_001",
                               "Incunder10k" = "B19001_002",
                              "10kto15k" = "B19001_003",
                              "15kto20k" = "B19001_004",
                              "20kto25k" = "B19001_005",
                              "25kto30k" = "B19001_006",
                              "30kto35k" = "B19001_007",
                              "35kto40k" = "B19001_008",
                              "40kto45k" = "B19001_009",
                              "45kto50k" = "B19001_010",
                              "50kto60k" = "B19001_011",
                              "60kto75k" = "B19001_012",
                              "75kto100k" = "B19001_013",
                              "100kto125k" = "B19001_014",
                              "125kto150k" = "B19001_015",
                              "150kto200k" = "B19001_016",
                              "incover200k" = "B19001_017",
                              "monthlycost" = "B25105_001",
                              "highschool" = "B15003_017",
                              "Associates" = "B15003_021",
                              "Bachelors" = "B15003_022",
                              "Masters" = "B15003_023",
                              "professional" = "B15003_024",
                              "Doctorate" = "B15003_025",
                              "employed" = "B23025_004",
                              "unemployed" = "B23025_005",
                              "laborforce" = "B23025_003",
                              "Gini" = "B19083_001",
                              "povertypop" = "B17001_002",
                              "medHouseprice" = "B25077_001",
                    "Hispanic Pop" = "B19013I_001",
                    "Hispanic Inc" = "B19013I_001",
                    "Asian Pop" = "B01001D_001",
                    "Asian Inc" = "B19013D_001"),
                geometry = TRUE,
                output = "wide") %>% clean_names()
```

```
Getting data from the 2015-2019 5-year ACS
Using FIPS code '24' for state 'MD'
Using FIPS code '027' for 'Howard County'
Using FIPS code '24' for state 'MD'
Using FIPS code '027' for 'Howard County'
```

Hide

```
#Calculating number of college educated people in census tract
Howard_Countytractdata2019$educated =
  ((Howard_Countytractdata2019$bachelors_e +
     Howard_Countytractdata2019$associates_e +
     Howard_Countytractdata2019$masters_e +
     Howard_Countytractdata2019$doctorate_e))

Howard_Countytractdata2019$educatedprop =
  Howard_Countytractdata2019$educated / Howard_Countytractdata2019$total_pop_e


Howard_Countytractdata2019$higheducated =
  (Howard_Countytractdata2019$masters_e + Howard_Countytractdata2019$doctorate_e +
     Howard_Countytractdata2019$professional_e)

Howard_Countytractdata2019$higheducatedprop =
  (Howard_Countytractdata2019$higheducated / Howard_Countytractdata2019$total_pop_e)




#Calculating employment and unemployment rate

Howard_Countytractdata2019$unemployedrate = Howard_Countytractdata2019$unemployed_e / Howard_Cou
ntytractdata2019$laborforce_e

Howard_Countytractdata2019$employedrate =
  Howard_Countytractdata2019$employed_e / Howard_Countytractdata2019$laborforce_e




#Calculating number of people Making over and under 30k (poor population)
Howard_Countytractdata2019$popunder30k= ((Howard_Countytractdata2019$incunder10k_e + Howard_Coun
tytractdata2019$x10kto15k_e + Howard_Countytractdata2019$x15kto20k_e + Howard_Countytractdata201
9$x25kto30k_e))


Howard_Countytractdata2019$popover30k=
  ((Howard_Countytractdata2019$x35kto40k_e + Howard_Countytractdata2019$x45kto50k_e + Howard_Cou
ntytractdata2019$x50kto60k_e + Howard_Countytractdata2019$x60kto75k_e +
Howard_Countytractdata2019$x75kto100k_e +
Howard_Countytractdata2019$x100kto125k_e +
Howard_Countytractdata2019$x125kto150k_e +
Howard_Countytractdata2019$x150kto200k_e +
Howard_Countytractdata2019$incover200k_e))



#Calculating population making over and under 150k (rich population)
Howard_Countytractdata2019$popover150k =
```

```
  (Howard_Countytractdata2019$incover200k_e + Howard_Countytractdata2019$x150kto200k_e)


Howard_Countytractdata2019$popunder150k =
  (Howard_Countytractdata2019$x35kto40k_e +
  Howard_Countytractdata2019$x45kto50k_e +
  Howard_Countytractdata2019$x50kto60k_e +
  Howard_Countytractdata2019$x60kto75k_e +
  Howard_Countytractdata2019$x75kto100k_e +
  Howard_Countytractdata2019$x100kto125k_e +
  Howard_Countytractdata2019$x125kto150k_e +
  Howard_Countytractdata2019$incunder10k_e +
    Howard_Countytractdata2019$x10kto15k_e +
    Howard_Countytractdata2019$x15kto20k_e +
    Howard_Countytractdata2019$x25kto30k_e)




#Calculating total rich and total poor populations for county
Howard_Countytractdata2019$poorcountypop = sum(Howard_Countytractdata2019$popunder150k)

Howard_Countytractdata2019$richcountypop =
  sum(Howard_Countytractdata2019$popover150k)


#Calculating rich and poor population ratios for census tracts

Howard_Countytractdata2019$nonpoorprop =           (Howard_Countytractdata2019$popover30k/
  (Howard_Countytractdata2019$popover30k + Howard_Countytractdata2019$popunder30k))

Howard_Countytractdata2019$poorprop =           (Howard_Countytractdata2019$popunder30k/
  (Howard_Countytractdata2019$popunder30k + Howard_Countytractdata2019$popover30k))

Howard_Countytractdata2019$richprop =
  (Howard_Countytractdata2019$popover150k/
     (Howard_Countytractdata2019$popover150k + Howard_Countytractdata2019$popunder150k))

Howard_Countytractdata2019$nonrichprop =
  (Howard_Countytractdata2019$popunder150k/
     (Howard_Countytractdata2019$popunder150k +    Howard_Countytractdata2019$popover150k))
```

Hide

```
#Calculating Dissimilarity Index
Howard_Countytractdata2019$poorpopratio =
  (Howard_Countytractdata2019$popunder150k / Howard_Countytractdata2019$poorcountypop)

Howard_Countytractdata2019$richpopratio =
  (Howard_Countytractdata2019$popover150k /
     Howard_Countytractdata2019$richcountypop)

Howard_Countytractdata2019$incomepopdifference =
  (Howard_Countytractdata2019$richpopratio - Howard_Countytractdata2019$poorpopratio)



Howard_Countytractdata2019$incDissim =  0.5*sum(abs(Howard_Countytractdata2019$incomepopdifferen
ce))
```

Hide

```
Howard_Countytractdata2019
```

```
Simple feature collection with 55 features and 96 fields
geometry type:  MULTIPOLYGON
dimension:      XY
bbox:           xmin: -77.18711 ymin: 39.10314 xmax: -76.69677 ymax: 39.36932
geographic CRS: NAD83
First 10 features:
         geoid                                          name total_pop_e
1  24027605504 Census Tract 6055.04, Howard County, Maryland        2650
2  24027606607 Census Tract 6066.07, Howard County, Maryland        4760
3  24027606704 Census Tract 6067.04, Howard County, Maryland        6899
4  24027601203 Census Tract 6012.03, Howard County, Maryland        7315
5  24027605401 Census Tract 6054.01, Howard County, Maryland        5250
6  24027605601 Census Tract 6056.01, Howard County, Maryland        6495
7  24027606803 Census Tract 6068.03, Howard County, Maryland        5452
8  24027606705 Census Tract 6067.05, Howard County, Maryland        2030
9  24027602303 Census Tract 6023.03, Howard County, Maryland        3822
10 24027606606 Census Tract 6066.06, Howard County, Maryland        5316
   total_pop_m black_pop_e black_pop_m black_inc_e black_inc_m
1          140         130          76      250001          NA
2          341        1418         299       71635       31151
3          558        2037         416      104068       22630
4          782        2870         586      130183       35806
5          516        1389         350       85517       17095
6          528        2552         660       83056       24500
7          413        1147         371       79375       33776
8          132         404          90      134167       59807
9          206         112         120          NA          NA
10         351        2117         459       75893       29578
   white_pop_e white_pop_m white_inc_e white_inc_m incunder10k_e
1         1381         119      233875       26520             0
2         2802         323      144167       16761            32
3         3288         351      102850       15853            97
4         2943         672      116069       21085            23
5         2559         376       89241       11295            51
6         3330         616      105101       15746            94
7         3411         295      114861       23713           175
8         1334         160      114271       14205            28
9         2113         215      186699       24312             0
10        1971         347       89957       19471           231
   incunder10k_m x10kto15k_e x10kto15k_m x15kto20k_e x15kto20k_m
1             12           0          12           6           8
2             30          30          45           9          14
3             68          58          56          31          37
4             38          42          47         106         129
5             45          67          80          37          43
6             72         118         120          20          32
7            110          79          77          16          25
8             37           0          12          24          22
9             12           9          14           0          12
10           110          58          53          73          71
   x20kto25k_e x20kto25k_m x25kto30k_e x25kto30k_m x30kto35k_e
1            0          12           0          12           7
2            0          12          91          75           9
```

```
3           51          62          59          52         138
4           96          75          11          19          10
5          110         107          13          21          13
6            0          17          82          61         144
7           16          26          20          33          30
8           19          15           5           9           9
9           20          21           0          12           8
10          31          33          60          63          47
   x30kto35k_m x35kto40k_e x35kto40k_m x40kto45k_e x40kto45k_m
1            9           0          12           0          12
2           16          23          26          23          20
3          105          28          31          52          42
4           16          38          42          35          31
5           22          49          57          72          77
6          114          33          34          91          56
7           36          26          31          14          23
8           10           0          12           9          12
9           12          13          19           9          16
10          41          33          40          60          41
   x45kto50k_e x45kto50k_m x50kto60k_e x50kto60k_m x60kto75k_e
1            0          12           0          12          15
2           41          32          90          69          83
3           15          23         114          76         226
4            0          17          79          68         113
5           77          67         134          74         191
6           23          36         143         113         237
7           17          26         110          69         140
8           28          31          32          32          34
9            8          14          27          25          18
10          46          56         209         115         186
   x60kto75k_m x75kto100k_e x75kto100k_m x100kto125k_e x100kto125k_m
1           13           42           25            30            19
2           37          165           61           252            90
3          100          369          140           470           138
4           82          370          125           412           149
5          108          546          159           263           108
6          136          374          135           374           168
7           71          438          161           394           142
8           18          101           40           138            56
9           18           59           39            79            41
10         110          287          111           333           117
   x125kto150k_e x125kto150k_m x150kto200k_e x150kto200k_m incover200k_e
1             64            38          152            41           446
2            140            67          345           101           265
3            269           111          257           118           348
4            303           103          366           108           388
5            317           152          127            75           290
6            227            96          352           139           308
7            223           102          245            96           390
8             71            31          108            40           166
9            164            54          282            72           528
10           155            87          255           118           135
   incover200k_m monthlycost_e monthlycost_m highschool_e highschool_m
1             45          3458          207          101           50
```

```
2             88          1844           225           389          162
3            131          1729           224           598          236
4            148          2007           112           455          202
5            145          1703            63           506          182
6            121          1800            96           556          201
7            107          1700            64           414          137
8             53          2065           138           148           52
9            105          2710           239           111           58
10            64          1596            82           291          113
   associates_e associates_m bachelors_e bachelors_m masters_e masters_m
1            18           14         616         110       518        74
2           126           56         928         211       611       114
3           356          186        1343         262       987       222
4           300          164        1517         291       943       217
5           183           91        1449         331       536       179
6           227          134        1562         287      1011       247
7           210           87        1196         218       892       192
8            76           35         563         110       284        62
9           150          110         973         140       676       137
10          165          100         766         184       898       173
   professional_e professional_m doctorate_e doctorate_m employed_e
1             172             50         147          47       1612
2             159             76         176          77       2312
3             217            134         130          86       3624
4              99             82         205          90       3701
5             105             72         126          94       2891
6             155             85         176         103       3385
7             125             79         250         132       3067
8              70             38          87          38       1122
9             157             64         243          80       2008
10            114             73         118          65       2778
   employed_m unemployed_e unemployed_m laborforce_e laborforce_m gini_e
1         127           34           19         1646          127 0.2899
2         236          162          110         2474          235 0.3532
3         383          148           94         3772          398 0.3709
4         411           87           84         3788          390 0.3586
5         392          141          114         3032          413 0.3680
6         360          156           87         3541          338 0.3987
7         292           69           56         3136          292 0.4020
8          87           32           25         1154           83 0.3592
9         165           79           61         2087          198 0.3647
10        251          262          142         3040          276 0.3978
   gini_m povertypop_e povertypop_m med_houseprice_e med_houseprice_m
1  0.0372           19           28           688200            22516
2  0.0304          474          288           385300            22052
3  0.0405          524          308           328000            10075
4  0.0622          481          373           358200            14181
5  0.0487          280          246           382000            29035
6  0.0448          335          196           398500            33837
7  0.0441          366          200           372300            26513
8  0.0435          119           91           344700            12088
9  0.0900           33           46           636300            16086
10 0.0346          551          257           287100            26806
   hispanic_pop_e hispanic_pop_m asian_pop_e asian_pop_m asian_inc_e
```

```
1              NA             NA        1023         126      189018
2          116976          40532         363         177       97375
3          132689          13494        1092         282      102548
4              NA             NA        1102         220      120101
5           70000          36687         507         302      134167
6           51320          30068         345         197      180662
7           79353          50047         576         210       75100
8              NA             NA         213         136      178333
9              NA             NA        1428         180      153523
10          78571          74771         845         244       53278
   asian_inc_m                       geometry educated educatedprop
1        27672 MULTIPOLYGON (((-76.94279 3...     1299    0.4901887
2        62102 MULTIPOLYGON (((-76.82816 3...     1841    0.3867647
3        44882 MULTIPOLYGON (((-76.85165 3...     2816    0.4081751
4        30752 MULTIPOLYGON (((-76.78696 3...     2965    0.4053315
5        67394 MULTIPOLYGON (((-76.86855 3...     2294    0.4369524
6        46645 MULTIPOLYGON (((-76.90219 3...     2976    0.4581986
7        44957 MULTIPOLYGON (((-76.88278 3...     2548    0.4673514
8        75007 MULTIPOLYGON (((-76.84743 3...     1010    0.4975369
9        36751 MULTIPOLYGON (((-76.89448 3...     2042    0.5342752
10       23106 MULTIPOLYGON (((-76.8229 39...     1947    0.3662528
   higheducated higheducatedprop unemployedrate employedrate popunder30k
1           837        0.3158491     0.02065614    0.9793439           6
2           946        0.1987395     0.06548100    0.9345190         162
3          1334        0.1933614     0.03923648    0.9607635         245
4          1247        0.1704716     0.02296727    0.9770327         182
5           767        0.1460952     0.04650396    0.9534960         168
6          1342        0.2066205     0.04405535    0.9559446         314
7          1267        0.2323918     0.02200255    0.9779974         290
8           441        0.2172414     0.02772964    0.9722704          57
9          1076        0.2815280     0.03785338    0.9621466           9
10         1130        0.2125658     0.08618421    0.9138158         422
   popover30k popover150k popunder150k poorcountypop richcountypop
1         749         598          157         62906         44841
2        1404         610          956         62906         44841
3        2096         605         1736         62906         44841
4        2069         754         1497         62906         44841
5        1994         417         1745         62906         44841
6        2071         660         1725         62906         44841
7        1983         635         1638         62906         44841
8         678         274          461         62906         44841
9        1178         810          377         62906         44841
10       1639         390         1671         62906         44841
   nonpoorprop   poorprop  richprop nonrichprop poorpopratio richpopratio
1    0.9920530 0.00794702 0.7920530   0.2079470  0.002495787  0.013336009
2    0.8965517 0.10344828 0.3895275   0.6104725  0.015197278  0.013603622
3    0.8953439 0.10465613 0.2584366   0.7415634  0.027596732  0.013492117
4    0.9191470 0.08085295 0.3349622   0.6650378  0.023797412  0.016814968
5    0.9222942 0.07770583 0.1928770   0.8071230  0.027739802  0.009299525
6    0.8683438 0.13165618 0.2767296   0.7232704  0.027421868  0.014718673
7    0.8724153 0.12758469 0.2793665   0.7206335  0.026038852  0.014161147
8    0.9224490 0.07755102 0.3727891   0.6272109  0.007328395  0.006110479
9    0.9924179 0.00758214 0.6823926   0.3176074  0.005993069  0.018063826
10   0.7952450 0.20475497 0.1892285   0.8107715  0.026563444  0.008697397
```

```
   incomepopdifference incDissim
1          0.010840222  0.298021
2         -0.001593657  0.298021
3         -0.014104615  0.298021
4         -0.006982444  0.298021
5         -0.018440277  0.298021
6         -0.012703195  0.298021
7         -0.011877704  0.298021
8         -0.001217915  0.298021
9          0.012070756  0.298021
10        -0.017866046  0.298021
```

Displaying Final Output

Hide

```
st_write(Howard_Countytractdata2019, "HowardCountyCensusACSdata2019.geojson")
```

```
Writing layer `HowardCountyCensusACSdata2019' to data source `HowardCountyCensusACSdata2019.geoj
son' using driver `GeoJSON'
Writing 55 features with 96 fields and geometry type Multi Polygon.
```

Turning Census data into QGIS Map

Hide

```
st_write(Howard_Countytractdata2019, "HowardCountyCensusACSdata2019.geojson")
st_write(Howard_Countytractdata2012, "HowardCountyCensusACSdata2012.geojson")
```

```

Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Ctrl+Alt+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Ctrl+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.
```