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> # Assignment: Week4, Assignment 2
> # Name: Koppula, Veera
> # Date: 2010-06-21
>
```

```
> ## Load the ggplot2 package
> library(ggplot2)
> library("readxl")
> library(MASS)
>
```

```
> theme_set(theme_minimal())
>
```

```
> ## Set the working directory to the root of your DSC 520 directory
> ##setwd("/home/jdoe/Workspaces/dsc520")
>
```

```
> ## Load the 'data/acs-14-1yr-s0201.csv'
> acs_df <- read.csv("data/acs-14-1yr-s0201.csv")
> acs_df
```

|    | Id              | Id2   | Geography                                  | PopGroupID | POPGROUP.display.label | RacesReported | HSDegree | BachDegree |
|----|-----------------|-------|--|------------|------------------------|---------------|----------|------------|
| 1  | 05000000US01073 | 1073  | Jefferson County, Alabama                  | 1          | Total population       | 660793        | 89.1     | 30.5       |
| 2  | 05000000US04013 | 4013  | Maricopa County, Arizona                   | 1          | Total population       | 4087191       | 86.8     | 30.2       |
| 3  | 05000000US04019 | 4019  | Pima County, Arizona                       | 1          | Total population       | 1004516       | 88.0     | 30.8       |
| 4  | 05000000US06001 | 6001  | Alameda County, California                 | 1          | Total population       | 1610921       | 86.9     | 42.8       |
| 5  | 05000000US06013 | 6013  | Contra Costa County, California            | 1          | Total population       | 1111339       | 88.8     | 39.7       |
| 6  | 05000000US06019 | 6019  | Fresno County, California                  | 1          | Total population       | 965974        | 73.6     | 19.7       |
| 7  | 05000000US06029 | 6029  | Kern County, California                    | 1          | Total population       | 874589        | 74.5     | 15.4       |
| 8  | 05000000US06037 | 6037  | Los Angeles County, California             | 1          | Total population       | 10116705      | 77.5     | 30.3       |
| 9  | 05000000US06059 | 6059  | Orange County, California                  | 1          | Total population       | 3145515       | 84.6     | 38.0       |
| 10 | 05000000US06065 | 6065  | Riverside County, California               | 1          | Total population       | 2329271       | 80.6     | 20.7       |
| 11 | 05000000US06067 | 6067  | Sacramento County, California              | 1          | Total population       | 1482026       | 86.8     | 28.9       |
| 12 | 05000000US06071 | 6071  | San Bernardino County, California          | 1          | Total population       | 2112619       | 78.6     | 18.9       |
| 13 | 05000000US06073 | 6073  | San Diego County, California               | 1          | Total population       | 3263431       | 86.6     | 37.1       |
| 14 | 05000000US06075 | 6075  | San Francisco County, California           | 1          | Total population       | 852469        | 88.1     | 54.2       |
| 15 | 05000000US06077 | 6077  | San Joaquin County, California             | 1          | Total population       | 715597        | 77.6     | 18.3       |
| 16 | 05000000US06081 | 6081  | San Mateo County, California               | 1          | Total population       | 758581        | 88.1     | 47.5       |
| 17 | 05000000US06085 | 6085  | Santa Clara County, California             | 1          | Total population       | 1894605       | 87.4     | 48.4       |
| 18 | 05000000US06097 | 6097  | Sonoma County, California                  | 1          | Total population       | 500292        | 87.6     | 34.8       |
| 19 | 05000000US06099 | 6099  | Stanislaus County, California              | 1          | Total population       | 531997        | 78.4     | 17.0       |
| 20 | 05000000US06111 | 6111  | Ventura County, California                 | 1          | Total population       | 846178        | 83.6     | 31.6       |
| 21 | 05000000US08005 | 8005  | Arapahoe County, Colorado                  | 1          | Total population       | 618821        | 91.9     | 40.9       |
| 22 | 05000000US08031 | 8031  | Denver County, Colorado                    | 1          | Total population       | 663862        | 85.5     | 44.3       |
| 23 | 05000000US08041 | 8041  | El Paso County, Colorado                   | 1          | Total population       | 663519        | 92.8     | 36.5       |
| 24 | 05000000US08059 | 8059  | Jefferson County, Colorado                 | 1          | Total population       | 558503        | 94.1     | 42.0       |
| 25 | 05000000US09001 | 9001  | Fairfield County, Connecticut              | 1          | Total population       | 945438        | 89.8     | 46.7       |
| 26 | 05000000US09003 | 9003  | Hartford County, Connecticut               | 1          | Total population       | 897985        | 89.3     | 36.8       |
| 27 | 05000000US09009 | 9009  | New Haven County, Connecticut              | 1          | Total population       | 861277        | 89.5     | 34.5       |
| 28 | 05000000US10003 | 10003 | New Castle County, Delaware                | 1          | Total population       | 552778        | 90.1     | 35.8       |
| 29 | 05000000US11001 | 11001 | District of Columbia, District of Columbia | 1          | Total population       | 658893        | 90.2     | 55.0       |
| 30 | 05000000US12009 | 12009 | Brevard County, Florida                    | 1          | Total population       | 556885        | 91.6     | 27.2       |
| 31 | 05000000US12011 | 12011 | Broward County, Florida                    | 1          | Total population       | 1869235       | 88.4     | 30.5       |
| 32 | 05000000US12031 | 12031 | Duval County, Florida                      | 1          | Total population       | 897698        | 89.0     | 26.1       |
| 33 | 05000000US12057 | 12057 | Hillsborough County, Florida               | 1          | Total population       | 1316298       | 87.3     | 29.8       |
| 34 | 05000000US12071 | 12071 | Lee County, Florida                        | 1          | Total population       | 679513        | 86.3     | 26.5       |
| 35 | 05000000US12086 | 12086 | Miami-Dade County, Florida                 | 1          | Total population       | 2662874       | 80.9     | 26.6       |
| 36 | 05000000US12095 | 12095 | Orange County, Florida                     | 1          | Total population       | 1253001       | 87.9     | 31.4       |
| 37 | 05000000US12099 | 12099 | Palm Beach County, Florida                 | 1          | Total population       | 1397710       | 87.7     | 33.0       |
| 38 | 05000000US12103 | 12103 | Pinellas County, Florida                   | 1          | Total population       | 938098        | 90.1     | 29.5       |
| 39 | 05000000US12105 | 12105 | Polk County, Florida                       | 1          | Total population       | 634638        | 84.9     | 19.7       |
| 40 | 05000000US12127 | 12127 | Volusia County, Florida                    | 1          | Total population       | 507531        | 88.9     | 22.5       |
| 41 | 05000000US13067 | 13067 | Cobb County, Georgia                       | 1          | Total population       | 730981        | 90.3     | 43.7       |
| 42 | 05000000US13089 | 13089 | DeKalb County, Georgia                     | 1          | Total population       | 722161        | 88.4     | 41.7       |
| 43 | 05000000US13121 | 13121 | Fulton County, Georgia                     | 1          | Total population       | 996319        | 91.3     | 49.2       |
| 44 | 05000000US13135 | 13135 | Gwinnett County, Georgia                   | 1          | Total population       | 877922        | 88.0     | 35.4       |
| 45 | 05000000US15003 | 15003 | Honolulu County, Hawaii                    | 1          | Total population       | 991788        | 91.8     | 32.6       |
| 46 | 05000000US17031 | 17031 | Cook County, Illinois                      | 1          | Total population       | 5246456       | 85.5     | 36.2       |
| 47 | 05000000US17043 | 17043 | DuPage County, Illinois                    | 1          | Total population       | 932708        | 92.3     | 48.0       |
| 48 | 05000000US17089 | 17089 | Kane County, Illinois                      | 1          | Total population       | 527306        | 82.9     | 32.6       |
| 49 | 05000000US17097 | 17097 | Lake County, Illinois                      | 1          | Total population       | 705186        | 90.3     | 44.0       |
| 50 | 05000000US17197 | 17197 | Will County, Illinois                      | 1          | Total population       | 685419        | 90.7     | 33.1       |
| 51 | 05000000US18097 | 18097 | Marion County, Indiana                     | 1          | Total population       | 934243        | 85.0     | 28.8       |
| 52 | 05000000US20091 | 20091 | Johnson County, Kansas                     | 1          | Total population       | 574272        | 95.5     | 52.8       |
| 53 | 05000000US20173 | 20173 | Sedgwick County, Kansas                    | 1          | Total population       | 508803        | 88.8     | 30.7       |
| 54 | 05000000US21111 | 21111 | Jefferson County, Kentucky                 | 1          | Total population       | 760026        | 88.5     | 31.6       |
| 55 | 05000000US24003 | 24003 | Anne Arundel County, Maryland              | 1          | Total population       | 560133        | 91.9     | 38.8       |
| 56 | 05000000US24005 | 24005 | Baltimore County, Maryland                 | 1          | Total population       | 826925        | 90.4     | 37.2       |
| 57 | 05000000US24031 | 24031 | Montgomery County, Maryland                | 1          | Total population       | 1030447       | 90.9     | 58.5       |
| 58 | 05000000US24033 | 24033 | Prince George's County, Maryland           | 1          | Total population       | 904430        | 85.5     | 31.0       |
| 59 | 05000000US24510 | 24510 | Baltimore city, Maryland                   | 1          | Total population       | 622793        | 84.4     | 30.0       |
| 60 | 05000000US25005 | 25005 | Bristol County, Massachusetts              | 1          | Total population       | 554194        | 82.5     | 25.7       |
| 61 | 05000000US25009 | 25009 | Essex County, Massachusetts                | 1          | Total population       | 769091        | 89.1     | 38.9       |
| 62 | 05000000US25017 | 25017 | Middlesex County, Massachusetts            | 1          | Total population       | 1570315       | 92.3     | 52.3       |
| 63 | 05000000US25021 | 25021 | Norfolk County, Massachusetts              | 1          | Total population       | 692254        | 94.1     | 51.9       |
| 64 | 05000000US25023 | 25023 | Plymouth County, Massachusetts             | 1          | Total population       | 507022        | 92.2     | 34.1       |
| 65 | 05000000US25025 | 25025 | Suffolk County, Massachusetts              | 1          | Total population       | 767254        | 83.9     | 42.3       |
| 66 | 05000000US25027 | 25027 | Worcester County, Massachusetts            | 1          | Total population       | 813475        | 90.1     | 34.6       |
| 67 | 05000000US26081 | 26081 | Kent County, Michigan                      | 1          | Total population       | 629237        | 89.1     | 33.7       |
| 68 | 05000000US26099 | 26099 | Macomb County, Michigan                    | 1          | Total population       | 860112        | 89.3     | 23.9       |
| 69 | 05000000US26125 | 26125 | Oakland County, Michigan                   | 1          | Total population       | 1237868       | 93.6     | 44.8       |
| 70 | 05000000US26163 | 26163 | Wayne County, Michigan                     | 1          | Total population       | 1764804       | 84.9     | 22.1       |
| 71 | 05000000US27053 | 27053 | Hennepin County, Minnesota                 | 1          | Total population       | 1212064       | 93.2     | 47.3       |
| 72 | 05000000US27123 | 27123 | Ramsey County, Minnesota                   | 1          | Total population       | 532655        | 89.9     | 40.9       |
| 73 | 05000000US29095 | 29095 | Jackson County, Missouri                   | 1          | Total population       | 683191        | 90.0     | 29.5       |
| 74 | 05000000US29189 | 29189 | St. Louis County, Missouri                 | 1          | Total population       | 1001876       | 93.2     | 42.8       |
| 75 | 05000000US31055 | 31055 | Douglas County, Nebraska                   | 1          | Total population       | 543244        | 88.2     | 36.3       |
| 76 | 05000000US32003 | 32003 | Clark County, Nevada                       | 1          | Total population       | 2069681       | 84.5     | 22.7       |
| 77 | 05000000US34003 | 34003 | Bergen County, New Jersey                  | 1          | Total population       | 933572        | 91.5     | 46.2       |
| 78 | 05000000US34007 | 34007 | Camden County, New Jersey                  | 1          | Total population       | 511038        | 88.3     | 31.3       |

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79 05000000US34013 34013 Essex County, New Jersey 1 Total population 795723 85.5 32.7
80 05000000US34017 34017 Hudson County, New Jersey 1 Total population 669115 83.4 38.2
81 05000000US34023 34023 Middlesex County, New Jersey 1 Total population 836297 89.1 41.0
82 05000000US34025 34025 Monmouth County, New Jersey 1 Total population 629279 93.1 43.7
83 05000000US34029 34029 Ocean County, New Jersey 1 Total population 586301 91.7 28.6
84 05000000US34031 34031 Passaic County, New Jersey 1 Total population 508856 83.8 28.6
85 05000000US34039 34039 Union County, New Jersey 1 Total population 552939 86.2 33.0
86 05000000US35001 35001 Bernalillo County, New Mexico 1 Total population 675551 88.0 32.7
87 05000000US36005 36005 Bronx County, New York 1 Total population 1438159 70.5 19.3
88 05000000US36029 36029 Erie County, New York 1 Total population 922835 90.6 31.3
89 05000000US36047 36047 Kings County, New York 1 Total population 2621793 80.0 34.3
90 05000000US36055 36055 Monroe County, New York 1 Total population 749857 90.3 35.9
91 05000000US36059 36059 Nassau County, New York 1 Total population 1358627 90.7 43.2
92 05000000US36061 36061 New York County, New York 1 Total population 1636268 86.8 59.9
93 05000000US36081 36081 Queens County, New York 1 Total population 2321580 80.4 29.8
94 05000000US36103 36103 Suffolk County, New York 1 Total population 1502968 89.8 34.0
95 05000000US36119 36119 Westchester County, New York 1 Total population 972634 87.4 47.1
96 05000000US37081 37081 Guilford County, North Carolina 1 Total population 512119 89.0 33.3
97 05000000US37119 37119 Mecklenburg County, North Carolina 1 Total population 1012539 89.5 43.0
98 05000000US37183 37183 Wake County, North Carolina 1 Total population 998691 92.4 49.2
99 05000000US39035 39035 Cuyahoga County, Ohio 1 Total population 1259828 88.1 31.0
100 05000000US39049 39049 Franklin County, Ohio 1 Total population 1231393 90.0 38.0
101 05000000US39061 39061 Hamilton County, Ohio 1 Total population 806631 90.5 35.6
102 05000000US39113 39113 Montgomery County, Ohio 1 Total population 533116 89.7 25.7
103 05000000US39153 39153 Summit County, Ohio 1 Total population 541943 91.1 30.3
104 05000000US40109 40109 Oklahoma County, Oklahoma 1 Total population 766215 86.8 30.6
105 05000000US40143 40143 Tulsa County, Oklahoma 1 Total population 629598 88.6 30.7
106 05000000US41051 41051 Multnomah County, Oregon 1 Total population 776712 91.1 41.6
107 05000000US41067 41067 Washington County, Oregon 1 Total population 562998 90.2 39.7
108 05000000US42003 42003 Allegheny County, Pennsylvania 1 Total population 1231255 93.9 37.7
109 05000000US42017 42017 Bucks County, Pennsylvania 1 Total population 626685 93.9 37.7
110 05000000US42029 42029 Chester County, Pennsylvania 1 Total population 512784 92.3 49.3
111 05000000US42045 42045 Delaware County, Pennsylvania 1 Total population 562960 91.5 36.3
112 05000000US42071 42071 Lancaster County, Pennsylvania 1 Total population 533320 84.9 26.0
113 05000000US42091 42091 Montgomery County, Pennsylvania 1 Total population 816857 93.7 47.3
114 05000000US42101 42101 Philadelphia County, Pennsylvania 1 Total population 1560297 82.6 26.0
115 05000000US44007 44007 Providence County, Rhode Island 1 Total population 631974 82.0 25.2
116 05000000US47037 47037 Davidson County, Tennessee 1 Total population 668347 86.7 37.3
117 05000000US47157 47157 Shelby County, Tennessee 1 Total population 938803 87.4 29.9
118 05000000US48029 48029 Bexar County, Texas 1 Total population 1855866 83.0 26.3
119 05000000US48085 48085 Collin County, Texas 1 Total population 885241 93.7 50.0
120 05000000US48113 48113 Dallas County, Texas 1 Total population 2518638 77.6 29.1
121 05000000US48121 48121 Denton County, Texas 1 Total population 753363 91.9 41.5
122 05000000US48141 48141 El Paso County, Texas 1 Total population 833487 75.8 21.1
123 05000000US48157 48157 Fort Bend County, Texas 1 Total population 685345 88.6 44.1
124 05000000US48201 48201 Harris County, Texas 1 Total population 4441370 79.8 29.7
125 05000000US48215 48215 Hidalgo County, Texas 1 Total population 831073 62.2 17.9
[ reached 'max' / getOption("max.print") -- omitted 11 rows ]
>
>
> ## Load the 'data/acs-14-1yr-s0201.csv'
> acs_df <- read.csv("data/acs-14-1yr-s0201.csv")
> acs_df
  id id2 Geography PopGroupID POPGROUP.display.label RacesReported HSDegree BachDegree
1 05000000US01073 1073 Jefferson County, Alabama 1 Total population 660793 89.1 30.5
2 05000000US04013 4013 Maricopa County, Arizona 1 Total population 4087191 86.8 30.2
3 05000000US04019 4019 Pima County, Arizona 1 Total population 1004516 88.0 30.8
4 05000000US06001 6001 Alameda County, California 1 Total population 1610921 86.9 42.8
5 05000000US06013 6013 Contra Costa County, California 1 Total population 1111339 88.8 39.7
6 05000000US06019 6019 Fresno County, California 1 Total population 965974 73.6 19.7
7 05000000US06029 6029 Kern County, California 1 Total population 874589 74.5 15.4
8 05000000US06037 6037 Los Angeles County, California 1 Total population 10116705 77.5 30.3
9 05000000US06059 6059 Orange County, California 1 Total population 3145515 84.6 38.0
10 05000000US06065 6065 Riverside County, California 1 Total population 2329271 80.6 20.7
11 05000000US06067 6067 Sacramento County, California 1 Total population 1482026 86.8 28.9
12 05000000US06071 6071 San Bernardino County, California 1 Total population 2112619 78.6 18.9
13 05000000US06073 6073 San Diego County, California 1 Total population 3263431 86.6 37.1
14 05000000US06075 6075 San Francisco County, California 1 Total population 852469 88.1 54.2
15 05000000US06077 6077 San Joaquin County, California 1 Total population 715597 77.6 18.3
16 05000000US06081 6081 San Mateo County, California 1 Total population 758581 88.1 47.5
17 05000000US06085 6085 Santa Clara County, California 1 Total population 1894605 87.4 48.4
18 05000000US06097 6097 Sonoma County, California 1 Total population 500292 87.6 34.8
19 05000000US06099 6099 Stanislaus County, California 1 Total population 531997 78.4 17.0
20 05000000US06111 6111 Ventura County, California 1 Total population 846178 83.6 31.6
21 05000000US08005 8005 Arapahoe County, Colorado 1 Total population 618821 91.9 40.9
22 05000000US08031 8031 Denver County, Colorado 1 Total population 663862 85.5 44.3
23 05000000US08041 8041 El Paso County, Colorado 1 Total population 663519 92.8 36.5
24 05000000US08059 8059 Jefferson County, Colorado 1 Total population 558503 94.1 42.0
25 05000000US09001 9001 Fairfield County, Connecticut 1 Total population 945438 89.8 46.7
26 05000000US09003 9003 Hartford County, Connecticut 1 Total population 897985 89.3 36.8
27 05000000US09009 9009 New Haven County, Connecticut 1 Total population 861277 89.5 34.5
28 05000000US10003 10003 New Castle County, Delaware 1 Total population 552778 90.1 35.8
29 05000000US11001 11001 District of Columbia, District of Columbia 1 Total population 658893 90.2 55.0
30 05000000US12009 12009 Brevard County, Florida 1 Total population 556885 91.6 27.2
31 05000000US12011 12011 Broward County, Florida 1 Total population 1869235 88.4 30.5
32 05000000US12031 12031 Duval County, Florida 1 Total population 897698 89.0 26.1
33 05000000US12057 12057 Hillsborough County, Florida 1 Total population 1316298 87.3 29.8
34 05000000US12071 12071 Lee County, Florida 1 Total population 679513 86.3 26.5
35 05000000US12086 12086 Miami-Dade County, Florida 1 Total population 2662874 80.9 26.6
36 05000000US12095 12095 Orange County, Florida 1 Total population 1253001 87.9 31.4
37 05000000US12099 12099 Palm Beach County, Florida 1 Total population 1397710 87.7 33.0
38 05000000US12103 12103 Pinellas County, Florida 1 Total population 938098 90.1 29.5
39 05000000US12105 12105 Polk County, Florida 1 Total population 634638 84.9 19.7
40 05000000US12127 12127 Volusia County, Florida 1 Total population 507531 88.9 22.5
41 05000000US13067 13067 Cobb County, Georgia 1 Total population 730981 90.3 43.7
42 05000000US13089 13089 DeKalb County, Georgia 1 Total population 722161 88.4 41.7

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|    |                 |       |                                  |   |                  |         |      |      |
|----|-----------------|-------|----------------------------------|---|------------------|---------|------|------|
| 43 | 05000000U513121 | 13121 | Fulton County, Georgia           | 1 | Total population | 996319  | 91.3 | 49.2 |
| 44 | 05000000U51335  | 13135 | Gwinnett County, Georgia         | 1 | Total population | 877922  | 88.0 | 35.4 |
| 45 | 05000000U515003 | 15003 | Honolulu County, Hawaii          | 1 | Total population | 991788  | 91.8 | 32.6 |
| 46 | 05000000U517031 | 17031 | Cook County, Illinois            | 1 | Total population | 5246456 | 95.5 | 36.2 |
| 47 | 05000000U517043 | 17043 | DuPage County, Illinois          | 1 | Total population | 932708  | 92.3 | 48.0 |
| 48 | 05000000U517089 | 17089 | Kane County, Illinois            | 1 | Total population | 527306  | 82.9 | 32.6 |
| 49 | 05000000U517097 | 17097 | Lake County, Illinois            | 1 | Total population | 705186  | 90.3 | 44.0 |
| 50 | 05000000U517197 | 17197 | Will County, Illinois            | 1 | Total population | 685419  | 90.7 | 33.1 |
| 51 | 05000000U518097 | 18097 | Marion County, Indiana           | 1 | Total population | 934243  | 85.0 | 28.8 |
| 52 | 05000000U520091 | 20091 | Johnson County, Kansas           | 1 | Total population | 574272  | 95.5 | 52.8 |
| 53 | 05000000U520173 | 20173 | Sedgewick County, Kansas         | 1 | Total population | 508803  | 88.8 | 30.7 |
| 54 | 05000000U521111 | 21111 | Jefferson County, Kentucky       | 1 | Total population | 760026  | 88.5 | 31.6 |
| 55 | 05000000U524003 | 24003 | Anne Arundel County, Maryland    | 1 | Total population | 560133  | 91.9 | 38.8 |
| 56 | 05000000U524005 | 24005 | Baltimore County, Maryland       | 1 | Total population | 826925  | 90.4 | 37.2 |
| 57 | 05000000U524031 | 24031 | Montgomery County, Maryland      | 1 | Total population | 1030447 | 90.9 | 58.5 |
| 58 | 05000000U524033 | 24033 | Prince George's County, Maryland | 1 | Total population | 9040430 | 85.5 | 31.0 |
| 59 | 05000000U524510 | 24510 | Baltimore city, Maryland         | 1 | Total population | 622793  | 84.4 | 30.0 |
| 60 | 05000000U525005 | 25005 | Bristol County, Massachusetts    | 1 | Total population | 554194  | 82.5 | 25.7 |
| 61 | 05000000U525009 | 25009 | Essex County, Massachusetts      | 1 | Total population | 769091  | 89.1 | 38.9 |
| 62 | 05000000U525017 | 25017 | Middlesex County, Massachusetts  | 1 | Total population | 1570315 | 92.3 | 52.3 |
| 63 | 05000000U525021 | 25021 | Norfolk County, Massachusetts    | 1 | Total population | 692254  | 94.1 | 51.9 |
| 64 | 05000000U525023 | 25023 | Plymouth County, Massachusetts   | 1 | Total population | 570222  | 92.2 | 34.1 |
| 65 | 05000000U525025 | 25025 | Suffolk County, Massachusetts    | 1 | Total population | 767254  | 83.9 | 42.3 |
| 66 | 05000000U525027 | 25027 | Worcester County, Massachusetts  | 1 | Total population | 813475  | 90.1 | 34.6 |
| 67 | 05000000U526081 | 26081 | Kent County, Michigan            | 1 | Total population | 629237  | 89.1 | 33.7 |
| 68 | 05000000U526099 | 26099 | Macomb County, Michigan          | 1 | Total population | 860112  | 93.3 | 23.9 |
| 69 | 05000000U526125 | 26125 | Oakland County, Michigan         | 1 | Total population | 1237868 | 93.6 | 44.8 |
| 70 | 05000000U526163 | 26163 | Wayne County, Michigan           | 1 | Total population | 1764804 | 94.9 | 22.1 |
| 71 | 05000000U527053 | 27053 | Hennepin County, Minnesota       | 1 | Total population | 1212064 | 93.2 | 47.3 |
| 72 | 05000000U527123 | 27123 | Ramsey County, Minnesota         | 1 | Total population | 532655  | 89.9 | 40.9 |
| 73 | 05000000U529095 | 29095 | Jackson County, Missouri         | 1 | Total population | 683191  | 90.0 | 29.5 |
| 74 | 05000000U529189 | 29189 | St. Louis County, Missouri       | 1 | Total population | 1001876 | 93.2 | 42.8 |
| 75 | 05000000U53005  | 31005 | Douglas County, Nebraska         | 1 | Total population | 543244  | 88.2 | 36.3 |
| 76 | 05000000U532003 | 32003 | Clark County, Nevada             | 1 | Total population | 2066811 | 84.5 | 22.7 |
| 77 | 05000000U534003 | 34003 | Bergen County, New Jersey        | 1 | Total population | 933572  | 91.5 | 46.2 |
| 78 | 05000000U534007 | 34007 | Camden County, New Jersey        | 1 | Total population | 511038  | 88.3 | 31.3 |
| 79 | 05000000U534013 | 34013 | Essex County, New Jersey         | 1 | Total population | 795723  | 85.5 | 32.7 |
| 80 | 05000000U534017 | 34017 | Hudson County, New Jersey        | 1 | Total population | 666115  | 83.4 | 38.2 |
| 81 | 05000000U534023 | 34023 | Middlesex County, New Jersey     | 1 | Total population | 836297  | 89.1 | 41.0 |
| 82 | 05000000U534025 | 34025 | Monmouth County, New Jersey      | 1 | Total population | 629279  | 93.1 | 43.7 |
| 83 | 05000000U534029 | 34029 | Ocean County, New Jersey         | 1 | Total population | 586301  | 91.7 | 28.6 |
| 84 | 05000000U534031 | 34031 | Passaic County, New Jersey       | 1 | Total population | 508586  | 83.8 | 28.6 |
| 85 | 05000000U534039 | 34039 | Union County, New Jersey         | 1 | Total population | 552939  | 86.2 | 33.0 |
| 86 | 05000000U535001 | 35001 | Bernalillo County, New Mexico    | 1 | Total population | 675551  | 88.0 | 32.7 |
| 87 | 05000000U536005 | 36005 |                                  |   |                  |         |      |      |

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6 2006-01-03 00:00:00      184667      1      15 18 51      R1      8101 229TH D... 98053 NA      REDMOND      -122. 47.7      7      4160      4
7 2006-01-04 00:00:00      1050000      1      3 NA      R1      21634 NE 87T... 98053 NA      REDMOND      -122. 47.7      10      3960      5
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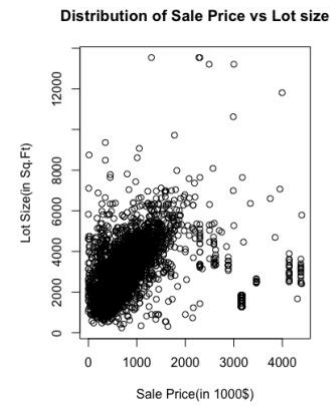
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[766] 215.83333 291.90751 261.75563 305.29595 217.83626 190.70513 234.40053 233.17073 219.64925 312.98959 230.63910 252.55155 281.53846 264.15094 278.10651
[781] 268.51852 763.15789 193.46734 63.10680 31.98003 354.83871 246.57534 229.81056 378.30688 245.48736 227.18000 268.59223 215.44715 236.18730 247.64047
[796] 282.17244 248.85827 245.75000 233.03704 326.92308 271.42857 77.62557 236.82222 230.00000 307.01754 253.36149 256.00000 260.41667 280.44780 306.47417
[811] 569.25996 274.36441 218.45103 980.48780 265.34653 322.18698 238.07823 265.48673 243.95833 249.50000 282.24852 292.72152 259.43396 195.16484 375.00000
[826] 288.33731 368.02920 299.23077 222.08122 306.85668 303.46821 345.86466 88.49558 257.35294 223.51471 253.06859 167.74194 208.06452 306.95652 81.93966
[841] 244.76440 240.75521 285.17647 308.44444 273.13084 336.71833 239.04444 260.46931 362.66667 247.70642 308.00000 68.87052 459.65418 280.17589 246.03175
[856] 218.75000 246.12500 214.95327 344.34783 273.84615 293.02326 258.06452 266.65333 270.18634 236.75487 339.00709 285.69498 254.46768 411.48649 277.75000
[871] 271.31783 267.21825 216.16541 209.76608 219.38724 267.44106 33.83621 290.20867 224.77064 244.81132 219.55026 240.92141 228.07018 266.33354 276.28289
[886] 225.77231 105.26316 276.17460 272.26429 272.86996 278.74396 261.68224 262.25490 290.44385 234.45385 186.27451 233.69589 271.13402 285.71053 257.35294
[901] 147.78325 240.22380 282.24526 239.04444 225.00000 249.97396 305.16129 279.47431 304.70588 255.97270 255.93870 239.13043 239.84064 228.97196 297.11098
[916] 58.90052 268.84615 293.63319 230.20833 268.27236 313.36898 259.89329 276.01156 298.44702 213.63636 294.10224 213.11475 183.67347 276.02524 242.03993
[931] 242.85714 218.67220 220.27419 523.85892 321.46799 257.46269 185.71429 258.50000 328.38710 165.39924 228.26087 250.68871 249.98611 213.22751 211.95652
[946] 251.68367 244.64286 339.18129 328.66889 281.98718 285.82090 225.77231 298.49948 260.66351 273.71875 185.07712 238.89078 249.99569 225.00000 243.05556
[961] 287.87879 283.95062 238.50267 311.35531 236.50154 357.75862 256.12536 236.03352 276.33136 119.14062 464.26786 272.95285 247.78761 316.73681 425.47872
[976] 164.80496 314.91713 239.49580 333.57086 285.14286 237.20207 289.31034 239.23611 254.23729 321.62162 331.42857 237.85597 344.59820 183.50340 266.44670
[991] 247.61905 281.16298 312.05185 269.23077 204.45833 241.68798 200.82742 117.33333 262.90323 288.59060
```

```
[ reached getOption("max.print") -- omitted 11865 entries ]
>
> ##Use the aggregate function on a variable in your dataset
> mean_sale_price_by_zip <- aggregate(housing_data$Sale Price',list(housing_data$zip5),mean)
> mean_sale_price_by_zip
  Group.1      x
1  98052 649375.4
2  98053 672623.7
3  98059 645000.0
4  98074 951543.8
>
> ##Use the plyr function on a variable in your dataset – more specifically, I want to see you split some data, perform a modification to the data, and then bring it back together
> library(dplyr)
> library(tidyverse)
> housing_data <- read_excel("data/week-6-housing.xlsx")
> housing_data <- housing_data %>%
+   mutate(ctname = case_when(is.na(ctname) & zip5 <= 98502 ~ "REDMOND",
+                             TRUE ~ ctname))
> housing_data
# A tibble: 12,865 x 24
  'Sale Date'      'Sale Price' sale_reason sale_instrument sale_warning sitetype addr_full      zip5 ctname postalctyn lon lat building_grade square_feet_total_... bedrooms
  <dtm>           <dbl>         <dbl>      <chr>      <chr>      <chr>      <dbl> <chr>      <chr>      <dbl>      <dbl>      <dbl>      <dbl>      <dbl>
1 2006-01-03 00:00:00 698000      1      3 NA      R1      17021 NE 113... 98052 REDMOND REDMOND -122. 47.7      9      2810      4
2 2006-01-03 00:00:00 649990      1      3 NA      R1      11927 178TH ... 98052 REDMOND REDMOND -122. 47.7      9      2880      4
3 2006-01-03 00:00:00 572500      1      3 NA      R1      13315 174TH ... 98052 REDMOND REDMOND -122. 47.7      8      2770      4
4 2006-01-03 00:00:00 420000      1      3 NA      R1      3303 178TH A... 98052 REDMOND REDMOND -122. 47.6      8      1620      3
5 2006-01-03 00:00:00 369900      1      3 15      R1      16126 NE 108... 98052 REDMOND REDMOND -122. 47.7      7      1440      3
6 2006-01-03 00:00:00 184667      1      15 18 51      R1      8101 229TH D... 98053 REDMOND REDMOND -122. 47.7      7      4160      4
7 2006-01-04 00:00:00 1050000      1      3 NA      R1      21634 NE 87T... 98053 REDMOND REDMOND -122. 47.7      10     3960      5
```

```

8 2006-01-04 00:00:00 875000 1 3 NA R1 21404 NE 67T... 98053 REDMOND REDMOND -122. 47.7 10 3720 4
9 2006-01-04 00:00:00 660000 1 3 NA R1 7525 238TH A... 98053 REDMOND REDMOND -122. 47.7 9 4160 4
10 2006-01-04 00:00:00 650000 1 3 NA R1 17703 NE 26T... 98052 REDMOND REDMOND -122. 47.6 8 2760 4
# ... with 12,855 more rows, and 9 more variables: bath_full_count <dbl>, bath_half_count <dbl>, bath_3qtr_count <dbl>, year_built <dbl>, year_renovated <dbl>, current_zoning <chr>,
# sq_ft_lot <dbl>, prop_type <chr>, present_use <dbl>
> ##Check distributions of the data
> plot(housing_data$`Sale Price`/1000, housing_data$`square_feet_total_living`, xlab = "Sale Price(in 1000$)", ylab = "Lot Size(in Sq.Ft)", main = "Distribution of Sale Price vs Lot size")

```



```

>
> ##Identify if there are any outliers
> summary(housing_data$`Sale Price`)
  Min. 1st Qu.  Median    Mean 3rd Qu.   Max.
  698  460000  593000  660738  750000 4400000
> #Based on the above summary and also the data distribution plot shared above there are outliers in the data. The min sale price is shown as $698 while Mean & Median are around $600000
> ##Create at least 2 new variables
> housing_data <- read_excel("data/week-6-housing.xlsx")
> sale_price <- housing_data$`Sale Price`
> square_footage <- housing_data$`square_feet_total_living`
> sale_price_per_feet_living_space <- mapply(function(x, y) x/y, sale_price, square_footage)
> mean_sale_price_by_zip <- aggregate(housing_data$`Sale Price`, list(housing_data$zip5), mean)

```