Lab 9 - Data Transformation

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Using your own dataset (which may include more than one table) carry out the following data cleaning steps. Knit together the PDF document and commit both the Lab 9 RMD file and the PDF document to Git. Push the changes to GitHub so both documents are visible in your public GitHub repository.

git add . git commit -m “”

1. In addition to simply naming variable names in select you can also use `:` to select a range of variables and `-` to exclude some variables, similar to indexing a `data.frame` with square brackets. You can use both variable's names as well as integer indexes.

a. Use `select()` to print out a tbl that contains only the first 3 columns of your dataset, called by name.
b. Print out a `tbl` with the last 3 columns of your dataset, called by name.
c. Find the most concise way to select the first 3 columns and the last 3 columns by name.

```
library(tidyverse)
```

```
## Loading tidyverse: ggplot2
## Loading tidyverse: tibble
## Loading tidyverse: tidyr
## Loading tidyverse: readr
## Loading tidyverse: purrr
## Loading tidyverse: dplyr
```

```
## Warning: package 'dplyr' was built under R version 3.4.2
```

```
## Conflicts with tidy packages ----------------------------------------------
```

```
## filter(): dplyr, stats
## lag():    dplyr, stats
```

```
setwd("/Users/marakage/Desktop/Honors/STAT/Labs/Lab-9")
load("lab8.RData")

#a.
select(barpop, POPGROUP.id, Asiansubgroup, subpoptotal)
```

```
## # A tibble: 10 x 3
## # Groups:   POPGROUP.id [10]
##    POPGROUP.id              Asiansubgroup subpoptotal
##          <chr>                      <chr>       <dbl>
##  1         012      Asian alone (400-499)      280815
##  2         015  Cambodian alone (405-409)        1955
##  3         016    Chinese alone (410-419)       59682
##  4         018  Taiwanese alone (412-419)         681
##  5         019   Filipino alone (420-421)       31990
##  6         020          Hmong alone (422)         175
##  7         022   Japanese alone (430-439)        6097
##  8         023     Korean alone (440-441)       16467
##  9         024        Laotian alone (442)        1286
## 10         029 Vietnamese alone (450-459)       28964
```

```
#b.
select(barpop, Asiansubgroup, subpoptotal, subgroup_prop)
```

```
## Adding missing grouping variables: `POPGROUP.id`
```

```
## # A tibble: 10 x 4
## # Groups:   POPGROUP.id [10]
##    POPGROUP.id              Asiansubgroup subpoptotal subgroup_prop
##          <chr>                      <chr>       <dbl>         <dbl>
##  1         012      Asian alone (400-499)      280815       0.14943
##  2         015  Cambodian alone (405-409)        1955       0.00104
##  3         016    Chinese alone (410-419)       59682       0.03176
##  4         018  Taiwanese alone (412-419)         681       0.00036
##  5         019   Filipino alone (420-421)       31990       0.01702
##  6         020          Hmong alone (422)         175       0.00009
##  7         022   Japanese alone (430-439)        6097       0.00324
##  8         023     Korean alone (440-441)       16467       0.00876
##  9         024        Laotian alone (442)        1286       0.00068
## 10         029 Vietnamese alone (450-459)       28964       0.01541
```

```
#c. besides calling the specific subroup name as above, maybe? Select(barpop, num_range(barpop, 1:3)) o
```

2. `dplyr` comes with a set of helper functions that can help you select groups of variables inside a `select()` call:

- `starts_with("X")`: every name that starts with "X",
- `ends_with("X")`: every name that ends with "X",
- `contains("X")`: every name that contains "X",
- `matches("X")`: every name that matches "X", where "X" can be a regular expression,
- `num_range("x", 1:5)`: the variables named x01, x02, x03, x04 and x05,
- `one_of(x)`: every name that appears in x, which should be a character vector.

```
library(dplyr)

select(AsianAlone, starts_with("A"))
```

```
## # A tibble: 1,360 x 0
```

```
select(AsianAlone, ends_with("n"))
```

```
## # A tibble: 1,360 x 0
```

```
select(AsianAlone, contains("a"))
```

```
## # A tibble: 1,360 x 2
##                                                    `POPGROUP.display-label`
##                                                                       <chr>
##  1                                                    Asian alone (400-499)
##  2                                                  Chinese alone (410-419)
##  3                                                 Filipino alone (420-421)
##  4 Asian alone or in combination with one or more other races  (400-499) & (10
##  5                                                    Asian alone (400-499)
##  6                                                  Chinese alone (410-419)
##  7                                                 Filipino alone (420-421)
##  8                                                 Japanese alone (430-439)
##  9                                                   Korean alone (440-441)
## 10                                                Vietnamese alone (450-459)
## # ... with 1,350 more rows, and 1 more variables:
```

```
## #   `GEO.display-label` <chr>
```

```
select(AsianAlone, matches("c"))
```

```
## # A tibble: 1,360 x 0
```

```
select(AsianAlone, num_range("019", 1:5))
```

```
## # A tibble: 1,360 x 0
```

```
Asiansubgroups <- c("GEO.id","GEO.id2")
select(AsianAlone, one_of(Asiansubgroups))
```

```
## # A tibble: 1,360 x 2
##                   GEO.id     GEO.id2
##                    <chr>       <chr>
##  1 1400000US53033000100 53033000100
##  2 1400000US53033000100 53033000100
##  3 1400000US53033000100 53033000100
##  4 1400000US53033000100 53033000100
##  5 1400000US53033000200 53033000200
##  6 1400000US53033000200 53033000200
##  7 1400000US53033000200 53033000200
##  8 1400000US53033000200 53033000200
##  9 1400000US53033000200 53033000200
## 10 1400000US53033000200 53033000200
## # ... with 1,350 more rows
```

Pay attention here: When you refer to columns directly inside `select()`, you don't use quotes. If you use the helper functions, you do use quotes.

a. Use `select()` and a helper function to print out a `tbl` that selects only variables that contain a specific character string.

b. Use `select()` and a helper function to print out a `tbl` that selects only variables that start with a certain letter or string of letters.

```
#a.
select(AsianAlone, contains("laotian"))
```

```
## # A tibble: 1,360 x 0
```

```
#b.
select(AsianAlone, starts_with("l"))
```

```
## # A tibble: 1,360 x 0
```

4. Are there any mutations you wish to carry out on your data (i.e. new variables you wish to create based upon the values of already existing variables)? If so, describe what they are and what you will name them.

For the barchart, I will need to create proportion column with the proportion of each subgroup population in comparison with total population in King County. It will be named "prop". The mutation will happen as I first need to summarize the total count for each subgroup, and remove the Asian Alone in combination with as it is not clear how the individuals of this category were grouped, mutate to create a new total population column, adding the proportional relation between subgroup and total population.

5. You can use mutate() to add multiple variables at once. To create more than one variable, place a comma between each variable that you define inside `mutate()`.

a. Carry out any and all of the mutations you wish to perform on your dataset and print the results to the console.

```
Data_Asian_Alone %>%
group_by(POPGROUP.id) %>% # Group by ethnicity/subgroup
  summarise(Total_pop = sum(Count)) %>% #Sum within subgroup
  filter(POPGROUP.id != 031) %>% #Remove asian and other
  mutate(Total_Asian = sum(Total_pop), #Create total asian pop variable
         proportion = Total_pop/Total_Asian) # Creating proportion of subgroup of total Asians
```

```
## # A tibble: 11 x 4
##    POPGROUP.id Total_pop Total_Asian   proportion
##          <chr>     <dbl>       <dbl>        <dbl>
##  1         012    280815      757540 0.3706932967
##  2         015      1955      757540 0.0025807218
##  3         016     59682      757540 0.0787839586
##  4         018       681      757540 0.0008989624
##  5         019     31990      757540 0.0422287932
##  6         020       175      757540 0.0002310109
##  7         022      6097      757540 0.0080484199
##  8         023     16467      757540 0.0217374660
##  9         024      1286      757540 0.0016976001
## 10         029     28964      757540 0.0382342847
## 11         031    329428      757540 0.4348654857
```

6. `R` comes with a set of logical operators that you can use inside `filter()`:

- `x < y`, `TRUE` if `x` is less than `y`
- `x <= y`, `TRUE` if `x` is less than or equal to `y`
- `x == y`, `TRUE` if `x` equals `y`
- `x != y`, `TRUE` if `x` does not equal `y`
- `x >= y`, `TRUE` if `x` is greater than or equal to `y`
- `x > y`, `TRUE` if `x` is greater than `y`
- `x %in% c(a, b, c)`, `TRUE` if `x` is in the vector `c(a, b, c)`

a. What are some potential subsets of your data that seem interesting and worth investigation to you?

I will be investigating the proportionality of the population of each Asian subgroup in relationship with total population of King County for the first visual, and faceting 11 maps depicting each Asian subgroup, plus Asian alone group and total population to geographicly represent each group by tract representation for the second visual representation.

b. Use at least two of the logical operators presented above to print these subsets of your data.

```
testAsian <- Data_Asian_Alone %>%
  filter (Count  >= 100 & Count <= 200)
```

7. `R` also comes with a set of boolean operators that you can use to combine multiple logical tests into a single test. These include `&` (and), `|` (or), and `!` (not). Instead of using the `&` operator, you can also pass several logical tests to `filter()`, separated by commas. `is.na()` will also come in handy.

```
  #filter(Data_Asian_Alone, Count > 100 & POPGROUP.id == "015")
Data_Asian_Alone %>%
  filter(!is.na(Count))
```

```
## # A tibble: 1,360 x 7
##    POPGROUP.id
##          <chr>
##  1         012
```

```
##  2         016
##  3         019
##  4         031
##  5         012
##  6         016
##  7         019
##  8         022
##  9         023
## 10         029
## # ... with 1,350 more rows, and 6 more variables:
## #   `POPGROUP.display-label` <chr>, GEO.id <chr>, GEO.id2 <chr>,
## #   `GEO.display-label` <chr>, D001 <chr>, Count <dbl>
```

a. Use R's logical and boolean operators to select just the rows in your data that meet a specific boolean condition.
b. Print out all of the observations in your data in which none of variables are NA.

```
is.na(AsianAlone)
```

```
##         POPGROUP.id POPGROUP.display-label GEO.id GEO.id2
##    [1,]       FALSE                  FALSE  FALSE   FALSE
##    [2,]       FALSE                  FALSE  FALSE   FALSE
##    [3,]       FALSE                  FALSE  FALSE   FALSE
##    [4,]       FALSE                  FALSE  FALSE   FALSE
##    [5,]       FALSE                  FALSE  FALSE   FALSE
##    [6,]       FALSE                  FALSE  FALSE   FALSE
##    [7,]       FALSE                  FALSE  FALSE   FALSE
##    [8,]       FALSE                  FALSE  FALSE   FALSE
##    [9,]       FALSE                  FALSE  FALSE   FALSE
##   [10,]       FALSE                  FALSE  FALSE   FALSE
##   [11,]       FALSE                  FALSE  FALSE   FALSE
##   [12,]       FALSE                  FALSE  FALSE   FALSE
##   [13,]       FALSE                  FALSE  FALSE   FALSE
##   [14,]       FALSE                  FALSE  FALSE   FALSE
##   [15,]       FALSE                  FALSE  FALSE   FALSE
##   [16,]       FALSE                  FALSE  FALSE   FALSE
##   [17,]       FALSE                  FALSE  FALSE   FALSE
##   [18,]       FALSE                  FALSE  FALSE   FALSE
##   [19,]       FALSE                  FALSE  FALSE   FALSE
##   [20,]       FALSE                  FALSE  FALSE   FALSE
##   [21,]       FALSE                  FALSE  FALSE   FALSE
##   [22,]       FALSE                  FALSE  FALSE   FALSE
##   [23,]       FALSE                  FALSE  FALSE   FALSE
##   [24,]       FALSE                  FALSE  FALSE   FALSE
##   [25,]       FALSE                  FALSE  FALSE   FALSE
##   [26,]       FALSE                  FALSE  FALSE   FALSE
##   [27,]       FALSE                  FALSE  FALSE   FALSE
##   [28,]       FALSE                  FALSE  FALSE   FALSE
##   [29,]       FALSE                  FALSE  FALSE   FALSE
##   [30,]       FALSE                  FALSE  FALSE   FALSE
##   [31,]       FALSE                  FALSE  FALSE   FALSE
##   [32,]       FALSE                  FALSE  FALSE   FALSE
##   [33,]       FALSE                  FALSE  FALSE   FALSE
##   [34,]       FALSE                  FALSE  FALSE   FALSE
##   [35,]       FALSE                  FALSE  FALSE   FALSE
```

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##   [36,]       FALSE                FALSE  FALSE   FALSE
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##   [39,]       FALSE                FALSE  FALSE   FALSE
##   [40,]       FALSE                FALSE  FALSE   FALSE
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##   [46,]       FALSE                FALSE  FALSE   FALSE
##   [47,]       FALSE                FALSE  FALSE   FALSE
##   [48,]       FALSE                FALSE  FALSE   FALSE
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##   [59,]       FALSE                FALSE  FALSE   FALSE
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##   [63,]       FALSE                FALSE  FALSE   FALSE
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##   [90,]       FALSE                FALSE  FALSE   FALSE
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#there are no observations NA in AsianALone table
```

8. `arrange()` can be used to rearrange rows according to any type of data. If you pass `arrange()` a character variable, for example, `R` will rearrange the rows in alphabetical order according to values of the variable. If you pass a factor variable, `R` will rearrange the rows according to the order of the levels in your factor (running `levels()` on the variable reveals this order).

```
testAsian_b <-
  select(AsianAlone, starts_with("A")) %>%
         arrange(Asiansubgroups)
```

By default, `arrange()` arranges the rows from smallest to largest. Rows with the smallest value of the variable will appear at the top of the data set. You can reverse this behavior with the `desc()` function. `arrange()` will reorder the rows from largest to smallest values of a variable if you wrap the variable name in `desc()` before passing it to `arrange()`.

a. Which variable(s) in your dataset would be logical to arrange your data on? Explain your reasoning.

From the main AsianAlone dataset,it is not important to arrange the data in a specific order as it is a categorical descriptive analysis of each subgroup and its population represented.

b. Arrange your data by this/these variables and print the results.

NA

9. You can use any function you like in `summarise()` so long as the function can take a vector of data and return a single number. `R` contains many aggregating functions, as `dplyr` calls them:

- `min(x)` - minimum value of vector `x`.
- `max(x)` - maximum value of vector `x`.
- `mean(x)` - mean value of vector `x`.
- `median(x)` - median value of vector `x`.
- `quantile(x, p)` - pth quantile of vector `x`.
- `sd(x)` - standard deviation of vector `x`.
- `var(x)` - variance of vector `x`.
- `IQR(x)` - Inter Quartile Range (IQR) of vector `x`.
- `diff(range(x))` - total range of vector `x`.

a. Pick at least one variable of interest to your project analysis.
b. Print out at least three summary statistics using `summarise()`.

```
as.numeric(AsianAlone$D001)
```

```
##    [1]  904  282  184 1073 1325  475  226  119  124  123 1554  374  126
##   [14]  469  735  183  148  156  855  402  132  522  217  280 1403  478
##   [27]  235  141 1617  720  226  135  835  289  125  365  196  256  260
##   [40]  108  313  301  121  358 1056  346  145  140 1227  687  200  171
##   [53]  792  346  463  130  244  339  431  116  546  419  124  508  608
##   [66]  177  766  554  152  688  283  113  385  400  138  494  549  254
##   [79]  685  273  102  375  235  324  366  116  519  386  121  549  246
##   [92]  400  176  273  228  355  239  373  284  434  324  467  127  189
##  [105]  139  219  520  137  703  202  274  327  139  433  247  105  313
##  [118]  817  308  139  183 1030  683  209  124  110  921  444  149  110
##  [131]  578  656  314  787  804  290  119 1033  169  259  187  268  375
##  [144]  523  242  342  361  528  250  333  246  359 1621  636  117  109
##  [157]  149  315  123 1872 1861  759  157  111  469  149 2136 1781  761
##  [170]  147  114  129  317  176 2135  399  553  285  417  451  166  601
##  [183]  321  118  445  347  480  398  592  309  443  373  481  235  333
##  [196]  186  288  145  224  243  328  339  424  596  162  781  145  226
##  [209]  199  326  474  115  631  288  345  818  221  112  109  943  528
##  [222]  144  634  336  450  461  110  591  499  143  650  211  304  295
##  [235]  422  255  428  372  105  515  884  255 1017  263  324  421  122
##  [248]  482  452  106  523  351  100  398  471  150  574  507  178  555
##  [261]  937  228  165  119  138 1094  342  443  151  252  412  117  540
##  [274]  884  170  107  211  158  176  974 1572 1026  139  103  203 1640
##  [287]  675  400  727  534  207  599 2027 1138  299  120  250 2168  984
##  [300]  159  122  397 1168  301  418  253  347  183  310  317  477  402
##  [313]  138  513 1343  484  280  105  276 1481 1696  853  427  159  113
##  [326] 1865 1361  231  365  134  388 1570  813  199  177  124  196  928
```

```
##   [339] 1489  207  600  420 1658 2572 1171  373  189  565 2722 2515 1215
##   [352]  695  113  294 2679  355  527  352  550  550  132  203  628  508
##   [365]  213  571 1126  309  445 1254  126  140 1981  486  293  846 2098
##   [378] 2547 1283  425  549 2677 2098  244  667  143  821 2233 1216  123
##   [391]  403  310 1311  617  147  271  671 1212  154  373  418 1398  616
##   [404]  224  157  749  689  287  178  784  293  109  408  273  415 2768
##   [417]  749  657  111  151  842 2902 1949  108  229  632  196  544 2123
##   [430] 2357  317  744  187  278  608 2606  195  303  131  210  248  351
##   [443]  643  263  129  745 1383  341  244  388  147 1553  444  120  555
##   [456]  649  127  133  114  805 1073  323  270  122  106 1235  738  198
##   [469]  208  821  563  164  145  647  323  122  411  518  168  108  594
##   [482] 1011  222  283  129  150 1167  624  174  130  746  504  128  136
##   [495]  616  197  294  340  102  481  457  162  556  929  263  165  136
##   [508] 1119  989  139 1118  244  349  247  317  590  108  117  719 1210
##   [521]  138  225  175 1324  510  134  614  616  185  100  701  463  151
##   [534]  561  516  102  649  718  131  849  467  117  100  548  435  132
##   [547]  532  698  278  863  263  337  679  153  103  901  526  182  671
##   [560]  164  231  544  186  739  618  162  815  955  274 1117  532  133
##   [573]  652 1144  292 1277  954  303  106 1071  305  349  285  371  296
##   [586]  349 3312  655 3495 1218  423 1320 1982  490 2107  727  308  812
##   [599] 1295  475  134 1453  907  346  113 1059  714  262  823 3063  461
##   [612]  102 3170 1171  316  147 1237 1112  389  103  175 1281  891  299
##   [625]  127  994  585  204  674  362  146  435  719  232  110  109  822
##   [638]  931  410  152 1006 2192  425 2327 1392  469  118  131 1533  629
##   [651]  266  748  486  166  137  544 1116  310  280 1179 1278  439  129
##   [664]  291 1347  939  379  117  172 1115 1682  588  110  544 1884  492
##   [677]  168  143  606  347  139  427 1364  618  167  226 1588  572  215
##   [690]  157  646  675  340  810  545  279  100  650  459  209  585  911
##   [703]  384  186 1014 1656  614  215  225  267 1823 1935  791  139  483
##   [716] 2102 1901 1094  108  221  252 2055 1049  523  104  208 1165 2567
##   [729] 1294  152  291  478  100 2798 1008  464  170  132 1145 1674  708
##   [742]  167  325 1878 1308  448  119  248  134 1498 1049  385  295 1179
##   [755]  965  282  152  256 1056 2413  736  259  657 2635 1492  352  193
##   [768]  432 1699  604  131  112  145  736  643  110  185  718  926  131
##   [781]  164  340 1089  836  119  117  332  974 1462  256  304  510 1591
##   [794] 1289  328  173  457 1430  792  184  199  925  669  199  146  760
##   [807]  566  253  715  477  246  569  871  119  250  180  994 1587  237
##   [820]  439  391 1762 1369  219  352  147  149  346 1533 1751  325  568
##   [833]  128  447 1931 2006  287  533  107  241  631 2199  794  106  151
##   [846]  190  948  520  127  238  539  681  133  159  807 1002  227  519
##   [859] 1086  527  105  244  580  721  101  290  849 1088  200  112  566
##   [872] 1193 1232  145  161  676 1337  635  101  274  698  472  163  538
##   [885]  531  109  215  598 1122  123  144  241 1266 1105  175  155  506
##   [898] 1219  650  106  357  756  273  368  175  121  114  186  337  442
##   [911]  341  416  535  112  571  716  111  252  812 1113  118  203  260
##   [924] 1274  734  125  112  871  460  148  549  410  116  505  383  521
##   [937]  396  113  497  250  309  863  233  191 1004  319  126  402  595
##   [950]  251  109  721  409  128  104  480  945  263  105  226 1093  210
##   [963]  262  921  139  331  145 1026  452  152  542  330  392 1224  100
##   [976]  109  304  223 1405  531  118  685  345  127  430 2054  412  469
##   [989]  457 2261  985  229  260  168 1126 1024  110  240  197 1102  954
## [1002]  147  231  223 1041  588  131  726 1583  159  328  249 1744 1281
## [1015]  141  319  256 1457 1403  117  178  320  189 1584  906  180  199
## [1028] 1019  793  224  130  913 1674  102  103  281  341 1860 1523  260
```

```
## [1041]  183 1721  662  150  130  822 1442  367  301 1645  959  142  177
## [1054] 1120  446  101  584  859  191  131 1036 1268  123  296  302  147
## [1067] 1497  483  157  571  644  119  212  113  739  672  204  107  814
## [1080] 1193  113  313  206  235 1390  579  144  110  116  691  434  222
## [1093]  498  841  126  379  988  617  171  175  775  766  205  269  924
## [1106]  401  201  478  443  108  143  581  502  105  176  658 1241  118
## [1119]  250  566 1431 1073  120  157  488 1251 1512  134  254  715  160
## [1132] 1682  332  121  472  506  147  649  388  174  466  550  157  146
## [1145]  648 1298  191  633 1497  674  105  306  783  366  184  446  363
## [1158]  135  434  205  269  228  306  156  213  130  209  165  240  397
## [1171]  148  473  541  269  656  289  393  325  117  455  135  190  147
## [1184]  239  922  172  125  149 1043  509  164  589  195  291  229  344
## [1197]  249  397  108  604  153  757  748  199  143  925  376  121  458
## [1210]  795  237  987  692  143  812  413  102  531  143  521  128  615
## [1223] 1597  345  414  138  113  229 1874  443  104  568  541  135  124
## [1236]  654  141  142  233  405  120  192  140  188  232  375  192  296
## [1249]  105  150  291  109  400  365  168  490 1112  447 1250  407  178
## [1262]  480 1185  342  111  160 1325 2723  792  150  114  499 3053 1092
## [1275]  476  111  115 1241 1862  689  159  176 2092  597  203  119  694
## [1288] 2099  674  108 2277 1168  435  120 1321  252  407 1422  376  149
## [1301]  105 1544  229  343 1973  353 2073  233  360  985  411 1115  672
## [1314]  244  823 1207  541 1379  376  455  224  320 1102  375 1239  323
## [1327]  406 1066  350 1194  740  202  876 1253  335 1414  249  314  262
## [1340]  112  313  192  263 2047  511  125 2241  133  226  151  269  158
## [1353]  225 1020  199  121  100 1285  171  132
```

```
testasian_c <- summarise(AsianAlone,
                         mean(as.numeric(D001), na.rm = TRUE))
```

10. `dplyr` provides several helpful aggregate functions of its own, in addition to the ones that are already defined in `R`. These include:

- `first(x)` - The first element of vector `x`.
- `last(x)` - The last element of vector `x`.
- `nth(x, n)` - The nth element of vector `x`.
- `n()` - The number of rows in the data.frame or group of observations that `summarise()` describes.
- `n_distinct(x)` - The number of unique values in vector `x`.

Next to these `dplyr`-specific functions, you can also turn a logical test into an aggregating function with `sum()` or `mean()`. A logical test returns a vector of TRUE's and FALSE's. When you apply `sum()` or `mean()` to such a vector, `R` coerces each `TRUE` to a `1` and each `FALSE` to a `0`. `sum()` then represents the total number of observations that passed the test; `mean()` represents the proportion.

a. Print out a summary of your data using at least two of these `dplyr`-specific aggregate functions.
b. Why did you choose the ones you did? What did you learn about your data from these summaries?

11. You can also combine `group_by()` with `mutate()`. When you mutate grouped data, `mutate()` will calculate the new variables independently for each group. This is particularly useful when `mutate()` uses the `rank()` function, that calculates within-group rankings. `rank()` takes a group of values and calculates the rank of each value within the group, e.g.

```
rank(c(21, 22, 24, 23))
```

has the output

```
[1] 1 2 4 3
```

As with `arrange()`, `rank()` ranks values from the smallest to the largest.

a. Using the %>% operator, first group your dataset by a meaningful variable, then perform a mutation that you're interested in.

b. What do the results tell you about different groups in you data?

```
#a.
  barpop <- mergedata %>%
  mutate(Asiansubgroup = `POPGROUP.display-label`) %>%
  group_by(POPGROUP.id, Asiansubgroup) %>%
  summarise(subpoptotal = sum(Count)) %>%
  mutate(subgroup_prop = round(subpoptotal/sum(data_subset_total$TotalCount), 5)) %>%
  filter(POPGROUP.id != "031")

#b. The results show the proportion of each Asian subgroup with the total population in King County. Th
```

12. The exercises so far have tried to get you to think about how to apply the five verbs of `dplyr` to your data.

a. Are there any specific transformations you want to make to your data? What are they and what aspect of your research question will they help you to answer?

The transformations have been divided in two groups. One is the above mentioend population representation of each Asian subgroup in relationship with the total population. The other is the representation of eah subgroup in each tract in King County. With both visual representations, I hope to convey the diversity of the Asian population, emphasizing the large gap in population representation, and other socioeconomic variables, to debunk pervasive narratives that group together "Asians", and outcomes in narrative, discourse and policies that affect particularly the subgroups mariginalized voices.

b. In a code chunk below, carry out all the data transformations you wish to perform on your data. Utilize the %>% operator to tie multiple commands together and make your code more readable and efficient. Remember to comment your code so it is clear why you doing things a certain way.

```
#this is the same code performed in Lab8

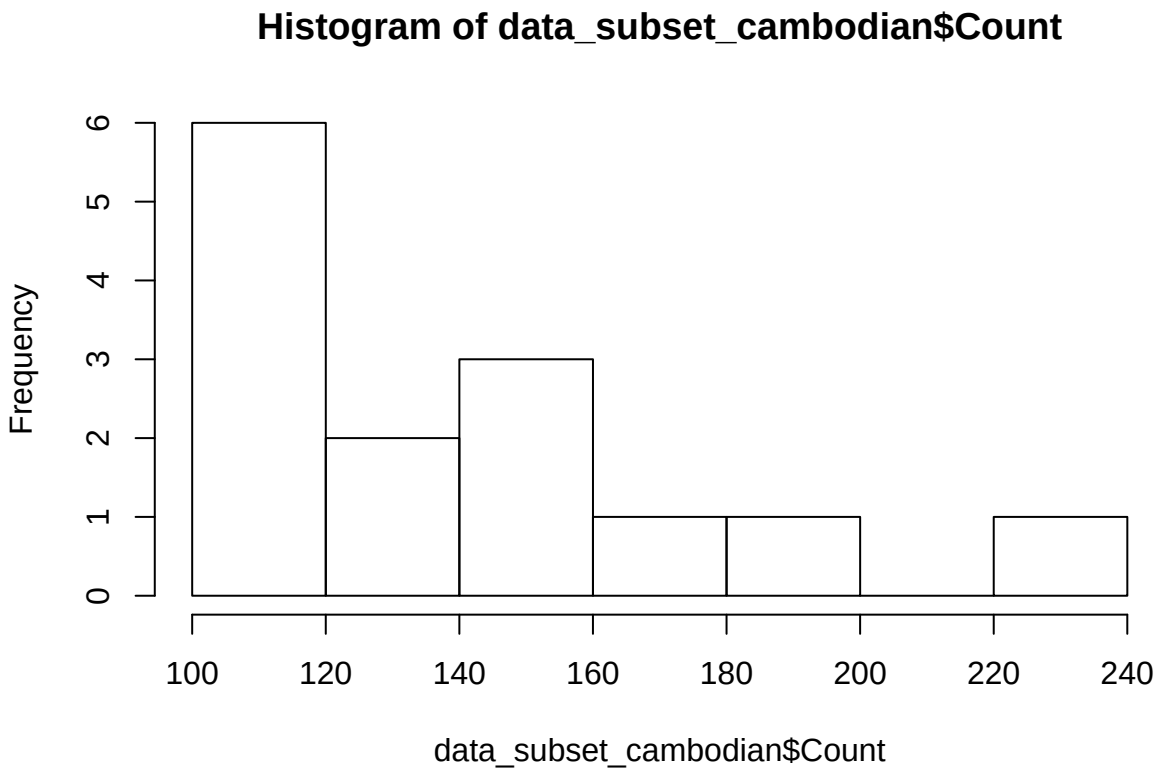
  AsianAlone <- AsianAlone[-1,]
prop_data <- AsianAlone %>%
  mutate(Count = as.numeric(as.character(D001)),
         POPGROUP.id = as.numeric(as.character(POPGROUP.id)))
# Make new count variable which is numeric version of D001

prop_data %>%
  group_by(POPGROUP.id) %>% # Group by ethnicity/subgroup
  summarise(Total_pop = sum(Count)) %>% #Sum within subgroup
  filter(POPGROUP.id != 031) %>% #Remove asian and other
  mutate(Total_Asian = sum(Total_pop), #Create total asian pop variable
         proportion = Total_pop/Total_Asian) # Creating proportion of subgroup of total Asians
```

```
## # A tibble: 10 x 4
##    POPGROUP.id Total_pop Total_Asian   proportion
##          <dbl>     <dbl>       <dbl>        <dbl>
##  1          12    279911      427208 0.6552101084
##  2          15      1955      427208 0.0045762252
##  3          16     59682      427208 0.1397024400
##  4          18       681      427208 0.0015940713
##  5          19     31990      427208 0.0748815565
##  6          20       175      427208 0.0004096365
##  7          22      6097      427208 0.0142717365
##  8          23     16467      427208 0.0385456265
```

```
##  9          24      1286      427208 0.0030102433
## 10          29     28964      427208 0.0677983558
```

```
hist(data_subset_cambodian$Count)
```




```
#Changing factors to numeric on D001 column/population

pop.chinese <- sum(as.numeric(data_subset_chinese$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.cambodian <- sum(as.numeric(data_subset_cambodian$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.japanese <- sum(as.numeric(data_subset_japanese$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.korean <- sum(as.numeric(data_subset_korean$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.laotian <- sum(as.numeric(data_subset_laotian$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.hmong <- sum(as.numeric(data_subset_hmong$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.taiwanese <- sum(as.numeric(data_subset_taiwanese$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.vietnames <- sum(as.numeric(data_subset_vietnamese$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop.filipino <- sum(as.numeric(data_subset_filipino$D001), na.rm=FALSE)
```

```
## Warning: Unknown or uninitialised column: 'D001'.
```

```
pop <- c(pop.chinese, pop.cambodian, pop.japanese, pop.korean, pop.laotian,
                 pop.hmong, pop.taiwanese, pop.vietnames, pop.filipino) %>% as.data.frame() %>% t()

colnames(pop) <- c("Chinese", "Cambodian", "Japanese", "Korean", "Laotian",
                   "Hmong", "Taiwanese", "Vietnames", "Filipino")


asian.pop <- data.frame("Chinese", pop.chinese, stringsAsFactors = FALSE)
names(asian.pop) <- c("Asian Population", "Total Population")
asian.pop[nrow(asian.pop) + 1,] = c("Cambodian", pop.cambodian)
```