

Assignment 1 – Data Analysis using R Programming

Group7

2024-02-11

```
knitr::opts_chunk$set(  
  echo = TRUE,  
  message = TRUE,  
  warning = TRUE  
)  
#Importing Libraries  
library(dplyr)
```

```
##  
## Attaching package: 'dplyr'  
  
## The following objects are masked from 'package:stats':  
##  
##   filter, lag  
  
## The following objects are masked from 'package:base':  
##  
##   intersect, setdiff, setequal, union
```

```
library(tidyr)  
  
#Print the structure of your dataset  
str(NY.House.Dataset)
```

```
## 'data.frame':   4801 obs. of  17 variables:  
## $ BROKERTITLE      : chr  "Brokered by Douglas Elliman -111 Fifth Ave" "Brokered by Serha  
## $ TYPE             : chr  "Condo for sale" "Condo for sale" "House for sale" "Condo for s  
## $ PRICE            : int  315000 195000000 260000 69000 55000000 690000 899500 16800000 2  
## $ BEDS            : int  2 7 4 3 7 5 2 8 1 2 ...  
## $ BATH             : int  2 10 2 1 2 2 2 16 1 1 ...  
## $ PROPERTYSQFT     : num  1400 17545 2015 445 14175 ...  
## $ ADDRESS         : chr  "2 E 55th St Unit 803" "Central Park Tower Penthouse-217 W 57th  
## $ STATE           : chr  "New York, NY 10022" "New York, NY 10019" "Staten Island, NY 10  
## $ MAIN_ADDRESS    : chr  "2 E 55th St Unit 803New York, NY 10022" "Central Park Tower Per  
## $ ADMINISTRATIVE_AREA_LEVEL_2: chr  "New York County" "United States" "United States" "United States  
## $ LOCALITY        : chr  "New York" "New York" "New York" "New York" ...  
## $ SUBLOCALITY     : chr  "Manhattan" "New York County" "Richmond County" "New York County  
## $ STREET_NAME     : chr  "East 55th Street" "New York" "Staten Island" "New York" ...  
## $ LONG_NAME       : chr  "Regis Residence" "West 57th Street" "Sinclair Avenue" "East 55  
## $ FORMATTED_ADDRESS: chr  "Regis Residence, 2 E 55th St #803, New York, NY 10022, USA" "2  
## $ LATITUDE        : num  40.8 40.8 40.5 40.8 40.8 ...  
## $ LONGITUDE       : num  -74 -74 -74.2 -74 -74 ...
```

```
#List the variables in your dataset
names(NY.House.Dataset)
```

```
## [1] "BROKERTITLE"      "TYPE"
## [3] "PRICE"            "BEDS"
## [5] "BATH"             "PROPERTYSQFT"
## [7] "ADDRESS"          "STATE"
## [9] "MAIN_ADDRESS"     "ADMINISTRATIVE_AREA_LEVEL_2"
## [11] "LOCALITY"         "SUBLOCALITY"
## [13] "STREET_NAME"      "LONG_NAME"
## [15] "FORMATTED_ADDRESS" "LATITUDE"
## [17] "LONGITUDE"
```

```
# Print the top 15 rows of your dataset
head(NY.House.Dataset, n=15)
```

```
##                                     BROKERTITLE
## 2                               Brokered by Douglas Elliman -111 Fifth Ave
## 3                               Brokered by Serhant
## 4                               Brokered by Sowae Corp
## 5                               Brokered by COMPASS
## 6 Brokered by Sotheby's International Realty - East Side Manhattan Brokerage
## 7                               Brokered by Sowae Corp
## 8                               Brokered by Douglas Elliman - 575 Madison Ave
## 9                               Brokered by Connie Profaci Realty
## 10                              Brokered by Pantiga Group Inc.
## 11                              Brokered by CENTURY 21 MK Realty
## 12                              Brokered by Engel & Volkers Americas
## 13                              Brokered by Re/Max Edge
## 14                              Brokered by COMPASS
## 15                              Brokered by Jamie & Connie Real Estate Grp
## 16                              Brokered by Corcoran Chelsea/Flatiron
##      TYPE      PRICE BEDS BATH PROPERTYSQFT
## 2      Condo for sale   315000      2      2      1400.000
## 3      Condo for sale 195000000      7     10     17545.000
## 4      House for sale   260000      4      2      2015.000
## 5      Condo for sale    69000      3      1       445.000
## 6      Townhouse for sale 55000000      7      2     14175.000
## 7      House for sale    690000      5      2      4004.000
## 8      Condo for sale    899500      2      2      2184.208
## 9      House for sale 16800000      8     16     33000.000
## 10     Co-op for sale    265000      1      1       750.000
## 11     Co-op for sale    440000      2      1       978.000
## 12     Co-op for sale    375000      2      1       850.000
## 13     Townhouse for sale 689000      3      2      1162.000
## 14     Co-op for sale    259000      3      1      2184.208
## 15     Co-op for sale    430000      2      2      2184.208
## 16     Co-op for sale    895000      3      1      2184.208
##                                     ADDRESS
## 2                               2 E 55th St Unit 803
## 3 Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse
## 4                               620 Sinclair Ave
## 5                               2 E 55th St Unit 908W33
```

## 6		5 E 64th St
## 7		584 Park Pl
## 8		157 W 126th St Unit 1B
## 9		177 Benedict Rd
## 10		875 Morrison Ave Apt 3M
## 11		1350 Ocean Pkwy Apt 5G
## 12		800 Grand Concourse Apt 2JS
## 13		456 Van Name Ave
## 14		34-41 85th St Unit 1D
## 15		91-15 Lamont Ave Unit 6D
## 16		61 Jane St Apt 6N
##	STATE	
## 2	New York, NY 10022	
## 3	New York, NY 10019	
## 4	Staten Island, NY 10312	
## 5	Manhattan, NY 10022	
## 6	New York, NY 10065	
## 7	Brooklyn, NY 11238	
## 8	New York, NY 10027	
## 9	Staten Island, NY 10304	
## 10	Bronx, NY 10473	
## 11	Brooklyn, NY 11230	
## 12	Bronx, NY 10451	
## 13	Staten Island, NY 10303	
## 14	Jackson Heights, NY 11372	
## 15	Elmhurst, NY 11373	
## 16	New York, NY 10014	
##		MAIN_ADDRESS
## 2		2 E 55th St Unit 803New York, NY 10022
## 3	Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse	New York, NY 10019
## 4		620 Sinclair AveStaten Island, NY 10312
## 5		2 E 55th St Unit 908W33Manhattan, NY 10022
## 6		5 E 64th StNew York, NY 10065
## 7		584 Park PlBrooklyn, NY 11238
## 8		157 W 126th St Unit 1BNew York, NY 10027
## 9		177 Benedict RdStaten Island, NY 10304
## 10		875 Morrison Ave Apt 3MBronx, NY 10473
## 11		1350 Ocean Pkwy Apt 5GBrooklyn, NY 11230
## 12		800 Grand Concourse Apt 2JSBronx, NY 10451
## 13		456 Van Name AveStaten Island, NY 10303
## 14		34-41 85th St Unit 1DJackson Heights, NY 11372
## 15		91-15 Lamont Ave Unit 6DElmhurst, NY 11373
## 16		61 Jane St Apt 6NNew York, NY 10014
##	ADMINISTRATIVE_AREA_LEVEL_2	LOCALITY SUBLOCALITY
## 2	New York County	New York Manhattan
## 3	United States	New York New York County
## 4	United States	New York Richmond County
## 5	United States	New York New York County
## 6	United States	New York New York County
## 7	United States	New York Kings County
## 8	New York	New York County New York
## 9	United States	New York Richmond County
## 10	Bronx County	The Bronx East Bronx
## 11	New York	Kings County Brooklyn

##	STREET_NAME	LONG_NAME	FORMATTED_ADDRESS	LATITUDE
## 12	New York	Bronx County	The Bronx	
## 13	United States	New York	Richmond County	
## 14	New York	Queens County	Queens	
## 15	New York	Queens County	Queens	
## 16	New York	New York County	New York	
## 2	East 55th Street	Regis Residence	Regis Residence, 2 E 55th St #803, New York, NY 10022, USA	40.76125
## 3	New York	West 57th Street	217 W 57th St, New York, NY 10019, USA	40.76639
## 4	Staten Island	Sinclair Avenue	620 Sinclair Ave, Staten Island, NY 10312, USA	40.54181
## 5	New York	East 55th Street	2 E 55th St, New York, NY 10022, USA	40.76140
## 6	New York	East 64th Street	5 E 64th St, New York, NY 10065, USA	40.76722
## 7	Brooklyn	Park Place	584 Park Pl, Brooklyn, NY 11238, USA	40.67436
## 8	Manhattan	157	157 W 126th St #1b, New York, NY 10027, USA	40.80945
## 9	Staten Island	Benedict Road	177 Benedict Rd, Staten Island, NY 10304, USA	40.59500
## 10	Morrison Avenue	Parking lot	Parking lot, 875 Morrison Ave #3m, Bronx, NY 10473, USA	40.82159
## 11	Midwood	1350	1350 Ocean Pkwy #5g, Brooklyn, NY 11230, USA	40.61574
## 12	Concourse Village	800	800 Grand Concourse #2j, Bronx, NY 10451, USA	40.82487
## 13	Staten Island	Van Name Avenue	456 Van Name Ave, Staten Island, NY 10303, USA	40.62500
## 14	Flushing	34-41	34-41 85th St #1b, Flushing, NY 11372, USA	40.75312
## 15	Elmhurst	91-15	91-15 Lamont Ave #6d, Elmhurst, NY 11373, USA	40.74386
## 16	Manhattan	61	61 Jane St #6n, New York, NY 10014, USA	40.73830
## 2				-73.97448
## 3				-73.98099
## 4				-74.19611
## 5				-73.97461
## 6				-73.96986
## 7				-73.95872
## 8				-73.94678
## 9				-74.10642
## 10				-73.87409
## 11				-73.96969
## 12				-73.92298
## 13				-74.15531
## 14				-73.88188
## 15				-73.87457
## 16				-74.00589

```
TOP_15_Rows= head(NY.House.Dataset, n=15)
TOP_15_Rows
```

```
##                                     BROKERTITLE
## 2                               Brokered by Douglas Elliman -111 Fifth Ave
## 3                               Brokered by Serhant
## 4                               Brokered by Sowae Corp
## 5                               Brokered by COMPASS
## 6 Brokered by Sotheby's International Realty - East Side Manhattan Brokerage
## 7                               Brokered by Sowae Corp
## 8                               Brokered by Douglas Elliman - 575 Madison Ave
## 9                               Brokered by Connie Profaci Realty
## 10                              Brokered by Pantiga Group Inc.
## 11                              Brokered by CENTURY 21 MK Realty
## 12                              Brokered by Engel & Volkers Americas
## 13                              Brokered by Re/Max Edge
## 14                              Brokered by COMPASS
## 15                              Brokered by Jamie & Connie Real Estate Grp
## 16                              Brokered by Corcoran Chelsea/Flatiron
##          TYPE      PRICE BEDS BATH PROPERTYSQFT
## 2      Condo for sale   315000      2      2      1400.000
## 3      Condo for sale 195000000      7     10     17545.000
## 4      House for sale   260000      4      2      2015.000
## 5      Condo for sale    69000      3      1       445.000
## 6      Townhouse for sale 55000000      7      2     14175.000
## 7      House for sale    690000      5      2      4004.000
## 8      Condo for sale    899500      2      2      2184.208
## 9      House for sale 16800000      8     16     33000.000
## 10     Co-op for sale    265000      1      1       750.000
## 11     Co-op for sale    440000      2      1       978.000
## 12     Co-op for sale    375000      2      1       850.000
## 13     Townhouse for sale 689000      3      2      1162.000
## 14     Co-op for sale    259000      3      1      2184.208
## 15     Co-op for sale    430000      2      2      2184.208
## 16     Co-op for sale    895000      3      1      2184.208
##                                     ADDRESS
## 2                               2 E 55th St Unit 803
## 3 Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse
## 4                               620 Sinclair Ave
## 5                               2 E 55th St Unit 908W33
## 6                               5 E 64th St
## 7                               584 Park Pl
## 8                               157 W 126th St Unit 1B
## 9                               177 Benedict Rd
## 10                              875 Morrison Ave Apt 3M
## 11                              1350 Ocean Pkwy Apt 5G
## 12                              800 Grand Concourse Apt 2JS
## 13                              456 Van Name Ave
## 14                              34-41 85th St Unit 1D
## 15                              91-15 Lamont Ave Unit 6D
## 16                              61 Jane St Apt 6N
##          STATE
## 2      New York, NY 10022
```

## 3	New York, NY 10019	
## 4	Staten Island, NY 10312	
## 5	Manhattan, NY 10022	
## 6	New York, NY 10065	
## 7	Brooklyn, NY 11238	
## 8	New York, NY 10027	
## 9	Staten Island, NY 10304	
## 10	Bronx, NY 10473	
## 11	Brooklyn, NY 11230	
## 12	Bronx, NY 10451	
## 13	Staten Island, NY 10303	
## 14	Jackson Heights, NY 11372	
## 15	Elmhurst, NY 11373	
## 16	New York, NY 10014	
##		MAIN_ADDRESS
## 2		2 E 55th St Unit 803New York, NY 10022
## 3	Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse	New York, NY 10019
## 4		620 Sinclair AveStaten Island, NY 10312
## 5		2 E 55th St Unit 908W33Manhattan, NY 10022
## 6		5 E 64th StNew York, NY 10065
## 7		584 Park PlBrooklyn, NY 11238
## 8		157 W 126th St Unit 1BNew York, NY 10027
## 9		177 Benedict RdStaten Island, NY 10304
## 10		875 Morrison Ave Apt 3MBronx, NY 10473
## 11		1350 Ocean Pkwy Apt 5GBrooklyn, NY 11230
## 12		800 Grand Concourse Apt 2JSBronx, NY 10451
## 13		456 Van Name AveStaten Island, NY 10303
## 14		34-41 85th St Unit 1DJackson Heights, NY 11372
## 15		91-15 Lamont Ave Unit 6DElmhurst, NY 11373
## 16		61 Jane St Apt 6NNew York, NY 10014
##	ADMINISTRATIVE_AREA_LEVEL_2	LOCALITY SUBLOCALITY
## 2	New York County	New York Manhattan
## 3	United States	New York New York County
## 4	United States	New York Richmond County
## 5	United States	New York New York County
## 6	United States	New York New York County
## 7	United States	New York Kings County
## 8	New York New York County	New York
## 9	United States	New York Richmond County
## 10	Bronx County	The Bronx East Bronx
## 11	New York	Kings County Brooklyn
## 12	New York	Bronx County The Bronx
## 13	United States	New York Richmond County
## 14	New York	Queens County Queens
## 15	New York	Queens County Queens
## 16	New York New York County	New York
##	STREET_NAME	LONG_NAME
## 2	East 55th Street	Regis Residence
## 3	New York West 57th Street	
## 4	Staten Island Sinclair Avenue	
## 5	New York East 55th Street	
## 6	New York East 64th Street	
## 7	Brooklyn	Park Place
## 8	Manhattan	157

```

## 9      Staten Island      Benedict Road
## 10     Morrison Avenue      Parking lot
## 11           Midwood           1350
## 12 Concourse Village           800
## 13      Staten Island Van Name Avenue
## 14           Flushing           34-41
## 15           Elmhurst           91-15
## 16      Manhattan           61
##
##                                     FORMATTED_ADDRESS LATITUDE
## 2  Regis Residence, 2 E 55th St #803, New York, NY 10022, USA 40.76125
## 3                217 W 57th St, New York, NY 10019, USA 40.76639
## 4                620 Sinclair Ave, Staten Island, NY 10312, USA 40.54181
## 5                2 E 55th St, New York, NY 10022, USA 40.76140
## 6                5 E 64th St, New York, NY 10065, USA 40.76722
## 7                584 Park Pl, Brooklyn, NY 11238, USA 40.67436
## 8                157 W 126th St #1b, New York, NY 10027, USA 40.80945
## 9                177 Benedict Rd, Staten Island, NY 10304, USA 40.59500
## 10   Parking lot, 875 Morrison Ave #3m, Bronx, NY 10473, USA 40.82159
## 11                1350 Ocean Pkwy #5g, Brooklyn, NY 11230, USA 40.61574
## 12                800 Grand Concourse #2j, Bronx, NY 10451, USA 40.82487
## 13                456 Van Name Ave, Staten Island, NY 10303, USA 40.62500
## 14                34-41 85th St #1b, Flushing, NY 11372, USA 40.75312
## 15                91-15 Lamont Ave #6d, Elmhurst, NY 11373, USA 40.74386
## 16                61 Jane St #6n, New York, NY 10014, USA 40.73830
##
## LONGITUDE
## 2  -73.97448
## 3  -73.98099
## 4  -74.19611
## 5  -73.97461
## 6  -73.96986
## 7  -73.95872
## 8  -73.94678
## 9  -74.10642
## 10 -73.87409
## 11 -73.96969
## 12 -73.92298
## 13 -74.15531
## 14 -73.88188
## 15 -73.87457
## 16 -74.00589

```

```

# Write a user defined function using any of the variables from the data set
Get_Max_Price = function(df, var){ return(max(df[[var]])) }
Get_Max_Price(NY.House.Dataset, "PRICE")

```

```
## [1] 2147483647
```

```

Get_Min_Price = function(df, var){ return(min(df[[var]])) }
Get_Min_Price(NY.House.Dataset, "PRICE")

```

```
## [1] 2494
```

```
Bed_Bath_Total = function(df, var1, var2) { return((df[[var1]])+(df[[var2]]))}
Bed_Bath_Total(NY.House.Dataset, "BEDS", "BATH")
```

```
##      [1]  4 17  6  4  9  7  4 24  2  3  3  5  4  4  4  4  5  4
##     [19]  2  4  5  4  9  2  4 10  2 14  2 16  7  3 18  9  2  2
##    [37] 15  2  2 11  8 12 12  2  3  7  5  4  3  4  4  6  3  6
##    [55]  4  4  8  7  7  5  2  2  2  4  4  4  2  5  8  5  6  5
##    [73]  4 11  7  5  7  5  5  7  4  4  9  5  7  8  5 12  4  2
##   [91]  2  4  6  4  9  4  6  4 10 16  2  5  4  7 10  6  7  3
##  [109]  4 11  8  6  6  6  7  6  7  4  5 14 13  8  5  6  5  8
## [127] 11  4  5  5  2  5  3 18  9  7  5  7  9 19  2 21  5  7
## [145]  3  6  2  6 11 11  4  4  4  6  7  5  7  4  5  5  5  5
## [163] 14 10  9 12  2  7  5  6  5  6  8  7  7  8  8  5  8  9
## [181]  5  6 10  5  2  8  7  6  4  5 10  7  7  8  4  5  5  5
## [199]  5  3 12  3  2  6  4  2  4  5  5  5  5  9  4 15  4  5
## [217]  2  5 15  5  3  4 22  3  3  8  2  8  6  5  7  8 24  2
## [235]  2  5  4  2  3  8  5  2  9  5  4  4  5  5  2 10  2  4
## [253]  2  5  2  2  4  3  2  3  4  5  2 12  4  3  5  3  2  7
## [271] 20 13  8  3  9  3  4  4  3  9  3  3  6 10 11  2  4  2
## [289]  3  5  9 10  8  8  7  6  6  4  2 11  3  7  7  6 13 15
## [307]  8  8  8  2  4  5  8  7  2 11  4  3  2  2  6  4  8  5
## [325]  9  3  7  5  5  8  4  4  4 12  9  9  3  9  6  4  5  6
## [343]  5  5  8  4  3  6  6  2  7  5  5  5  7  5  4  8  2  2
## [361]  5  8  4  4 10  4  4  8  3  5  7  4  3  4 18  6  8  5
## [379]  5  2  7  7  6  3  3  3  4  3  5  5  4  7  5 11  4 12
## [397]  4  5  5  4  5  5  5 11  7  9  5  5  5  5  5  5  5  5
## [415]  5  5  5  5  5  5  5  5  6  5  7  5  5  5  5  8  8  4  5
## [433]  3  9  3  6  2  6  5  5  5  5  5  6  3  7  4  3  5  5
## [451]  3  5  6  5  5  6  8  7  5  4  8  4 12  5  6 18  5  5
## [469]  3 21  4  3  3  6  4  5  8  6  5  7  4  5  7  9  5  2
## [487]  4  4  2  5  5  4  7 10  7  9  5  9  5  8 10 11  4  3
## [505]  6  5  4 11  4  4  2  7  3 14  6  5 15  4  5  3  6  8
## [523]  6  3 13 11  6  8  5  6  5  6 20  5  6  6  4  3  5  8
## [541]  2  5  5  5  6  8  5  8  5  4 22  7  4  4  5  4 12 14
## [559]  7  8  5  2  7  4  7  9  7  9  5  8  4  5  8  5  8  4
## [577]  4  5  4  4  4  5  2 14  4  3  3  5  5  3  5  5  7  6
## [595]  5  7  7  6  3  4  7 16  3  3  6  3  7  3  6  7  9  3
## [613]  6  6  7  5  3  3  3  3  3  3 35  9 17  7 12  5  4  9
## [631]  3 23  5  7  5  8  4  4  7  7  3  5  9  6 11  5  6  6
## [649]  8  5  8  8  5  2  5  6  9  2  7 10  6  7  3  2  4  7
## [667]  4  3  8  4  3  5  6  4  4  5  8  3  4  5 10  8  4  9
## [685] 10  8  7  2  4  7  7  5 11  2  6  5 11  6  5  5  2  3
## [703] 10  5  2  4  7  5  4  5  5  6  6  8 12  2  8  7  6  6
## [721]  5  8  7  4  8  4  2  8  4  3  5  6  4 24  5  5 11  8
## [739]  4  6  6  5  2  9 12  4  3  6  9  9 30  4  9  5  4  8
## [757]  7  4  5  2  9  3  2  9  5 51  8  6 10  4  3  4  4  7
## [775]  2  3  7 10  5  5  3  4  4  9  7  5  7  3  6  5  5  5
## [793]  3  4  5  6  2  5  3  5  6  5  6 12  6  2  5  7  2  3
## [811]  8  7  5  6  2  5  5  8  6  6  7  4  2  5  3  5  3  2
## [829]  5  2  3  3  2  5  5  2  5  5  7  4 15  2  4  4  6  9
## [847]  6  6  2  9 11  4 11  4  5  2  4  8  3  3  8  5  3  4
## [865]  7  7  6  7  4  3  2  7  7  6  5  4  5  8  7  5  5  4
## [883]  4  3  4  7 10  6  9  4  6  5  5  2  8  2  8  8  3  8
```


##	[901]	5	3	5	5	5	5	4	5	7	2	7	4	2	7	6	2	5	9
##	[919]	4	2	6	14	8	4	9	11	7	5	8	17	3	3	2	13	17	3
##	[937]	32	13	6	7	5	4	15	4	4	4	10	4	4	3	8	6	8	5
##	[955]	4	9	9	5	3	4	14	7	2	5	7	6	10	3	2	13	8	2
##	[973]	13	10	8	8	11	3	8	4	6	5	6	5	7	5	7	5	5	8
##	[991]	7	9	9	3	3	4	4	3	11	5	5	8	9	8	6	11	5	3
##	[1009]	8	2	7	5	2	2	8	5	8	4	3	3	4	5	5	10	6	5
##	[1027]	7	8	4	4	8	5	2	7	6	6	2	4	15	2	9	2	6	3
##	[1045]	5	3	5	6	2	6	5	4	10	2	8	2	5	9	4	2	5	4
##	[1063]	5	15	3	4	5	10	10	5	2	8	20	7	6	16	2	12	5	7
##	[1081]	4	6	3	2	5	4	7	8	2	9	5	6	32	3	5	4	6	6
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## [4429]	9	2	8	8	4	4	3	9	4	3	3	2	4	5	6	7	5	2
## [4447]	2	11	3	6	14	2	6	12	5	2	6	8	4	5	4	2	6	4
## [4465]	2	12	10	5	5	5	4	6	3	11	4	2	10	3	7	3	6	4
## [4483]	6	2	16	7	4	5	2	2	6	8	7	4	2	10	5	2	2	6
## [4501]	2	20	2	2	2	6	2	6	5	3	5	2	9	2	3	10	3	4
## [4519]	14	6	5	8	3	20	4	2	4	5	3	5	2	3	8	7	8	7
## [4537]	4	4	2	6	2	7	2	2	9	2	8	3	4	3	12	8	6	4
## [4555]	4	2	3	5	2	9	2	5	4	4	12	11	6	5	11	5	5	5
## [4573]	4	6	2	2	9	4	5	4	2	11	6	4	2	4	7	6	8	4
## [4591]	3	3	6	4	8	16	4	2	2	5	4	4	4	8	4	6	4	3
## [4609]	8	4	5	5	8	2	4	5	5	4	6	3	8	10	4	5	3	2
## [4627]	4	8	2	4	2	5	5	10	4	3	6	2	11	4	4	5	7	3
## [4645]	4	11	2	9	8	6	5	17	4	4	2	2	5	2	4	3	4	4
## [4663]	3	3	3	9	10	2	10	3	4	2	11	2	2	3	5	6	6	5
## [4681]	4	7	3	6	4	6	5	5	6	18	9	23	2	4	3	6	4	2
## [4699]	8	2	8	8	10	2	4	3	5	3	6	4	2	3	3	3	2	2
## [4717]	4	7	2	3	4	11	10	2	2	5	4	5	8	4	4	3	2	5
## [4735]	5	4	4	2	3	5	7	3	2	3	3	17	5	4	5	4	4	3
## [4753]	4	2	2	2	4	3	4	5	10	5	2	5	4	7	4	7	6	2
## [4771]	5	5	2	3	7	5	5	5	6	5	10	4	5	8	3	11	15	4

```
## [4789] 5 2 5 4 10 6 4 24 2 2 2 3 2
```

```
#Use data manipulation techniques and filter rows based on any logical criteria that exist in your data.
filtered_dataset = filter(NY.House.Dataset, TYPE == "House for sale" & LOCALITY == "New York")
#View(filtered_dataset)
head(filtered_dataset, n=5)
```

```
##          BROKERTITLE          TYPE    PRICE BEDS BATH
## 1    Brokered by Sowae Corp House for sale 260000    4    2
## 2    Brokered by Sowae Corp House for sale 690000    5    2
## 3 Brokered by Connie Profaci Realty House for sale 16800000    8   16
## 4    Brokered by Radiant Estates LLC House for sale 639999    3    2
## 5    Brokered by Elizabeth Marra House for sale 750000    2    2
##  PROPERTYSQFT      ADDRESS          STATE
## 1      2015 620 Sinclair Ave Staten Island, NY 10312
## 2      4004      584 Park Pl      Brooklyn, NY 11238
## 3     33000  177 Benedict Rd Staten Island, NY 10304
## 4      1260      27 Clove Way Staten Island, NY 10301
## 5      1330     280 Loretto St Staten Island, NY 10307
##          MAIN_ADDRESS ADMINISTRATIVE_AREA_LEVEL_2 LOCALITY
## 1 620 Sinclair AveStaten Island, NY 10312      United States New York
## 2      584 Park PlBrooklyn, NY 11238      United States New York
## 3 177 Benedict RdStaten Island, NY 10304      United States New York
## 4      27 Clove WayStaten Island, NY 10301      United States New York
## 5 280 Loretto StStaten Island, NY 10307      United States New York
##    SUBLOCALITY  STREET_NAME      LONG_NAME
## 1 Richmond County Staten Island Sinclair Avenue
## 2    Kings County      Brooklyn      Park Place
## 3 Richmond County Staten Island  Benedict Road
## 4 Richmond County Staten Island      Clove Way
## 5 Richmond County Staten Island  Loretto Street
##          FORMATTED_ADDRESS LATITUDE LONGITUDE
## 1 620 Sinclair Ave, Staten Island, NY 10312, USA 40.54181 -74.19611
## 2      584 Park Pl, Brooklyn, NY 11238, USA 40.67436 -73.95872
## 3 177 Benedict Rd, Staten Island, NY 10304, USA 40.59500 -74.10642
## 4      27 Clove Way, Staten Island, NY 10301, USA 40.62074 -74.11144
## 5 280 Loretto St, Staten Island, NY 10307, USA 40.50398 -74.23966
```

```
#Identify the dependent & independent variables and use reshaping techniques and create a new data frame
House_address = cbind(NY.House.Dataset$ADDRESS, NY.House.Dataset$STATE, NY.House.Dataset$LOCALITY, NY.H
#View(House_address)
head(House_address, n=5)
```

```
##      [,1]
## [1,] "2 E 55th St Unit 803"
## [2,] "Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse"
## [3,] "620 Sinclair Ave"
## [4,] "2 E 55th St Unit 908W33"
## [5,] "5 E 64th St"
##      [,2]          [,3]          [,4]
## [1,] "New York, NY 10022" "New York" "Manhattan"
## [2,] "New York, NY 10019" "New York" "New York County"
## [3,] "Staten Island, NY 10312" "New York" "Richmond County"
```

```
## [4,] "Manhattan, NY 10022"      "New York" "New York County"
## [5,] "New York, NY 10065"      "New York" "New York County"
```

```
# Remove missing values in your dataset.
NY.House.Dataset = na.omit(NY.House.Dataset)
#Identify and remove duplicated data in your dataset
Duplicate_Values = duplicated(NY.House.Dataset)
head(Duplicate_Values, n=5)
```

```
## [1] FALSE FALSE FALSE FALSE FALSE
```

```
#Deleting Duplicate rows if any
Delete_duplicate = NY.House.Dataset[!duplicated(NY.House.Dataset), ]
#View(Delete_duplicate)
#NY.House.Dataset[!duplicated(NY.House.Dataset), ]
NY.House.Dataset = NY.House.Dataset[!duplicated(NY.House.Dataset), ]
```

```
# Reorder multiple rows in descending order
library(dplyr)
library(tidyr)
Ordered_DataSet = NY.House.Dataset %>% arrange(desc(PRICE) , desc(PROPERTYSQFT) , desc(BEDS) , desc(BATH))
#View(Ordered_DataSet)
head(Ordered_DataSet, n=5)
```

```
##                                     BROKERTITLE
## 1                               Brokered by ANNE LOPA REAL ESTATE
## 2                               Brokered by Serhant
## 3 Brokered by Sotheby's International Realty - East Side Manhattan Brokerage
## 4                               Brokered by COMPASS
## 5                               Brokered by Douglas Elliman - 575 Madison Ave
```

```
##          TYPE      PRICE BEDS BATH PROPERTYSQFT
## 1 House for sale 2147483647    7    6    10000.000
## 2 Condo for sale 1950000000    7   10    17545.000
## 3 Townhouse for sale 650000000    3    2    15200.000
## 4 Co-op for sale 600000000    8    8     2184.208
## 5 House for sale 560000000   11   10    24000.000
```

```
##                                     ADDRESS
## 1                               6659-6675 Amboy Rd
## 2 Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse
## 3                               4 E 79th St
## 4                               960 5th Ave Unit 12
## 5                               9 W 54th St
```

```
##          STATE
## 1 New York, NY 10309
## 2 New York, NY 10019
## 3 New York, NY 10075
## 4 Manhattan, NY 10075
## 5 New York, NY 10019
```

```
##                                     MAIN_ADDRESS
## 1                               6659-6675 Amboy RdNew York, NY 10309
## 2 Central Park Tower Penthouse-217 W 57th New York St Unit PenthouseNew York, NY 10019
## 3                               4 E 79th StNew York, NY 10075
```

```
## 4          960 5th Ave Unit 12Manhattan, NY 10075
## 5          9 W 54th StNew York, NY 10019
##  ADMINISTRATIVE_AREA_LEVEL_2      LOCALITY      SUBLOCALITY      STREET_NAME
## 1          United States      New York Richmond County Staten Island
## 2          United States      New York New York County      New York
## 3          United States      New York New York County      New York
## 4          New York New York County      New York      Manhattan
## 5          United States      New York New York County      New York
##      LONG_NAME      FORMATTED_ADDRESS LATITUDE
## 1      Amboy Road 6659 Amboy Rd, Staten Island, NY 10309, USA 40.51848
## 2 West 57th Street      217 W 57th St, New York, NY 10019, USA 40.76639
## 3 East 79th Street      4 E 79th St, New York, NY 10075, USA 40.77656
## 4          960      960 5th Ave #12, New York, NY 10075, USA 40.77564
## 5 West 54th Street      9 W 54th St, New York, NY 10019, USA 40.76160
##      LONGITUDE
## 1 -74.22442
## 2 -73.98099
## 3 -73.96332
## 4 -73.96425
## 5 -73.97619
```

#Rename some of the column names in your dataset

```
library(dplyr)
```

```
NY.House.Dataset = NY.House.Dataset %>% rename(BROKER = BROKERTITLE, HOUSE_TYPE = TYPE, PROPERTY_SQFT =
```

```
#View(NY.House.Dataset)
```

```
head(NY.House.Dataset, n=5)
```

```
##      BROKER
## 2      Brokered by Douglas Elliman -111 Fifth Ave
## 3      Brokered by Serhant
## 4      Brokered by Sowae Corp
## 5      Brokered by COMPASS
## 6 Brokered by Sotheby's International Realty - East Side Manhattan Brokerage
##      HOUSE_TYPE      PRICE BEDS BATH PROPERTY_SQFT
## 2      Condo for sale      315000      2      2      1400
## 3      Condo for sale 195000000      7      10      17545
## 4      House for sale      260000      4      2      2015
## 5      Condo for sale      69000      3      1      445
## 6 Townhouse for sale 55000000      7      2      14175
##      ADDRESS
## 2      2 E 55th St Unit 803
## 3 Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse
## 4      620 Sinclair Ave
## 5      2 E 55th St Unit 908W33
## 6      5 E 64th St
##      STATE
## 2      New York, NY 10022
## 3      New York, NY 10019
## 4 Staten Island, NY 10312
## 5      Manhattan, NY 10022
## 6      New York, NY 10065
##      MAIN_ADDRESS
## 2      2 E 55th St Unit 803New York, NY 10022
## 3 Central Park Tower Penthouse-217 W 57th New York St Unit PenthouseNew York, NY 10019
```

```
## 4          620 Sinclair Ave Staten Island, NY 10312
## 5          2 E 55th St Unit 908W33 Manhattan, NY 10022
## 6          5 E 64th St New York, NY 10065
##  ADMINISTRATIVE_AREA_LEVEL_2 LOCALITY      SUBLOCALITY      STREET_NAME
## 2          New York County New York      Manhattan East 55th Street
## 3          United States New York New York County      New York
## 4          United States New York Richmond County      Staten Island
## 5          United States New York New York County      New York
## 6          United States New York New York County      New York
##      LONG_NAME      FORMATTED_ADDRESS
## 2  Regis Residence Regis Residence, 2 E 55th St #803, New York, NY 10022, USA
## 3 West 57th Street      217 W 57th St, New York, NY 10019, USA
## 4  Sinclair Avenue      620 Sinclair Ave, Staten Island, NY 10312, USA
## 5 East 55th Street      2 E 55th St, New York, NY 10022, USA
## 6 East 64th Street      5 E 64th St, New York, NY 10065, USA
##  LATITUDE LONGITUDE
## 2 40.76125 -73.97448
## 3 40.76639 -73.98099
## 4 40.54181 -74.19611
## 5 40.76140 -73.97461
## 6 40.76722 -73.96986
```

```
#Add new variables in your data frame by using a mathematical function (for e.g. - multiply an existing
library(dplyr)
NY.House.Dataset = NY.House.Dataset %>% mutate(MORTGAGE = ((0.03/12)*PRICE))
head(NY.House.Dataset, n=5)
```

```
##      BROKER
## 2      Brokered by Douglas Elliman -111 Fifth Ave
## 3      Brokered by Serhant
## 4      Brokered by Sowae Corp
## 5      Brokered by COMPASS
## 6 Brokered by Sotheby's International Realty - East Side Manhattan Brokerage
##      HOUSE_TYPE      PRICE BEDS BATH PROPERTY_SQFT
## 2      Condo for sale      315000      2      2      1400
## 3      Condo for sale 195000000      7      10      17545
## 4      House for sale      260000      4      2      2015
## 5      Condo for sale      69000      3      1      445
## 6 Townhouse for sale 55000000      7      2      14175
##      ADDRESS
## 2          2 E 55th St Unit 803
## 3 Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse
## 4          620 Sinclair Ave
## 5          2 E 55th St Unit 908W33
## 6          5 E 64th St
##      STATE
## 2      New York, NY 10022
## 3      New York, NY 10019
## 4      Staten Island, NY 10312
## 5      Manhattan, NY 10022
## 6      New York, NY 10065
##      MAIN_ADDRESS
## 2          2 E 55th St Unit 803 New York, NY 10022
## 3 Central Park Tower Penthouse-217 W 57th New York St Unit Penthouse New York, NY 10019
```



```
## 4          620 Sinclair Ave Staten Island, NY 10312
## 5          2 E 55th St Unit 908W33 Manhattan, NY 10022
## 6          5 E 64th St New York, NY 10065
##   ADMINISTRATIVE_AREA_LEVEL_2 LOCALITY      SUBLOCALITY      STREET_NAME
## 2          New York County New York      Manhattan East 55th Street
## 3          United States New York New York County      New York
## 4          United States New York Richmond County      Staten Island
## 5          United States New York New York County      New York
## 6          United States New York New York County      New York
##           LONG_NAME                                FORMATTED_ADDRESS
## 2   Regis Residence Regis Residence, 2 E 55th St #803, New York, NY 10022, USA
## 3   West 57th Street                                217 W 57th St, New York, NY 10019, USA
## 4   Sinclair Avenue                                620 Sinclair Ave, Staten Island, NY 10312, USA
## 5   East 55th Street                                2 E 55th St, New York, NY 10022, USA
## 6   East 64th Street                                5 E 64th St, New York, NY 10065, USA
##   LATITUDE LONGITUDE MORTGAGE
## 2 40.76125 -73.97448   787.5
## 3 40.76639 -73.98099 487500.0
## 4 40.54181 -74.19611   650.0
## 5 40.76140 -73.97461   172.5
## 6 40.76722 -73.96986 137500.0
```

#Create a training set using random number generator engine.

```
library(dplyr)
library(tidyr)
set.seed(123)
n_train = 40
train_indices <- sample(1:nrow(NY.House.Dataset), n_train)
train_set <- NY.House.Dataset[train_indices, ]
#View(train_set)
head(train_set, n=5)
```

```
##                                     BROKER      HOUSE_TYPE
## 2559 Brokered by Charles Rutenberg Realty Inc      House for sale
## 2612          Brokered by B Square Realty          Condo for sale
## 2312          Brokered by Werba Realty Llc Multi-family home for sale
## 543   Brokered by Premium Choice Realty Corp      House for sale
## 4485   Brokered by E Realty International Corp      Co-op for sale
##           PRICE BEDS BATH PROPERTY_SQFT      ADDRESS      STATE
## 2559  999000    4    3    2184.208      78-27 268th St Glen Oaks, NY 11004
## 2612  528000    2    1    753.000 69-88 136th St Unit B Flushing, NY 11367
## 2312 1245000    5    2    1800.000 64-56 Woodbine St Ridgewood, NY 11385
## 543   609000    3    2    1620.000 4384 Locust Point Dr Bronx, NY 10465
## 4485  289000    1    1    2184.208 97-40 62nd Dr Unit 11C Rego Park, NY 11374
##           MAIN_ADDRESS ADMINISTRATIVE_AREA_LEVEL_2
## 2559      78-27 268th StGlen Oaks, NY 11004      United States
## 2612 69-88 136th St Unit BFlushing, NY 11367      United States
## 2312 64-56 Woodbine StRidgewood, NY 11385      United States
## 543   4384 Locust Point DrBronx, NY 10465      United States
## 4485 97-40 62nd Dr Unit 11CRego Park, NY 11374      New York
##           LOCALITY      SUBLOCALITY STREET_NAME      LONG_NAME
## 2559      New York Queens County      Queens      268th Street
## 2612      New York Queens County      Queens      136th Street
## 2312      New York Queens County      Queens      Woodbine Street
```

```
## 543      New York  Bronx County  The Bronx Locust Point Drive
## 4485 Queens County      Queens  Rego Park      97-40
##
##          FORMATTED_ADDRESS LATITUDE LONGITUDE MORTGAGE
## 2559      78-27 268th St, Glen Oaks, NY 11004, USA 40.74920 -73.70451 2497.5
## 2612      6988 136th St, Flushing, NY 11367, USA 40.72676 -73.82946 1320.0
## 2312 64-56 Woodbine St, Ridgewood, NY 11385, USA 40.70859 -73.89344 3112.5
## 543      4384 Locust Point Dr, Bronx, NY 10465, USA 40.81658 -73.80070 1522.5
## 4485 97-40 62nd Dr #11c, Rego Park, NY 11374, USA 40.73254 -73.86015 722.5
```

#Print the summary statistics of your dataset

```
library(dplyr)
library(tidyr)
Summary_stats = summary(NY.House.Dataset)
Summary_stats
```

```
##      BROKER      HOUSE_TYPE      PRICE      BEDS
## Length:4587      Length:4587      Min.   :2.494e+03      Min.   : 1.000
## Class :character      Class :character      1st Qu.:4.990e+05      1st Qu.: 2.000
## Mode  :character      Mode  :character      Median :8.250e+05      Median : 3.000
##                                     Mean  :2.381e+06      Mean   : 3.366
##                                     3rd Qu.:1.498e+06      3rd Qu.: 4.000
##                                     Max.   :2.147e+09      Max.   :50.000
##      BATH      PROPERTY_SQFT      ADDRESS      STATE
## Min.   : 0.000      Min.   : 230      Length:4587      Length:4587
## 1st Qu.: 1.000      1st Qu.: 1200      Class :character      Class :character
## Median : 2.000      Median : 2184      Mode  :character      Mode  :character
## Mean   : 2.354      Mean   : 2178
## 3rd Qu.: 3.000      3rd Qu.: 2184
## Max.   :50.000      Max.   :65535
## MAIN_ADDRESS      ADMINISTRATIVE_AREA_LEVEL_2      LOCALITY
## Length:4587      Length:4587      Length:4587
## Class :character      Class :character      Class :character
## Mode  :character      Mode  :character      Mode  :character
##
##
##
## SUBLOCALITY      STREET_NAME      LONG_NAME      FORMATTED_ADDRESS
## Length:4587      Length:4587      Length:4587      Length:4587
## Class :character      Class :character      Class :character      Class :character
## Mode  :character      Mode  :character      Mode  :character      Mode  :character
##
##
##
##      LATITUDE      LONGITUDE      MORTGAGE
## Min.   :40.50      Min.   : -74.25      Min.   :      6
## 1st Qu.:40.64      1st Qu.: -73.99      1st Qu.:     1248
## Median :40.73      Median : -73.95      Median :     2062
## Mean   :40.71      Mean   : -73.94      Mean   :     5953
## 3rd Qu.:40.77      3rd Qu.: -73.87      3rd Qu.:     3746
## Max.   :40.91      Max.   : -73.70      Max.   :    5368709
```

#Use any of the numerical variables from the dataset and perform the following statistical functions
#Mean

```

#Median
#Mode
#Range
library(dplyr)
library(tidyr)
mean_value <- mean(NY.House.Dataset$PRICE)
median_value = median(NY.House.Dataset$PRICE)
mode_value <- table(NY.House.Dataset$PRICE)[which.max(table(NY.House.Dataset$PRICE))]
range_value = range(NY.House.Dataset$PRICE)
print(paste0("mean: ", mean_value))

```

```
## [1] "mean: 2381171.6823632"
```

```
print(paste0("median: ", median_value))
```

```
## [1] "median: 825000"
```

```
print(paste0("mode: ", mode_value))
```

```
## [1] "mode: 51"
```

```
print(paste0("range: ", range_value))
```

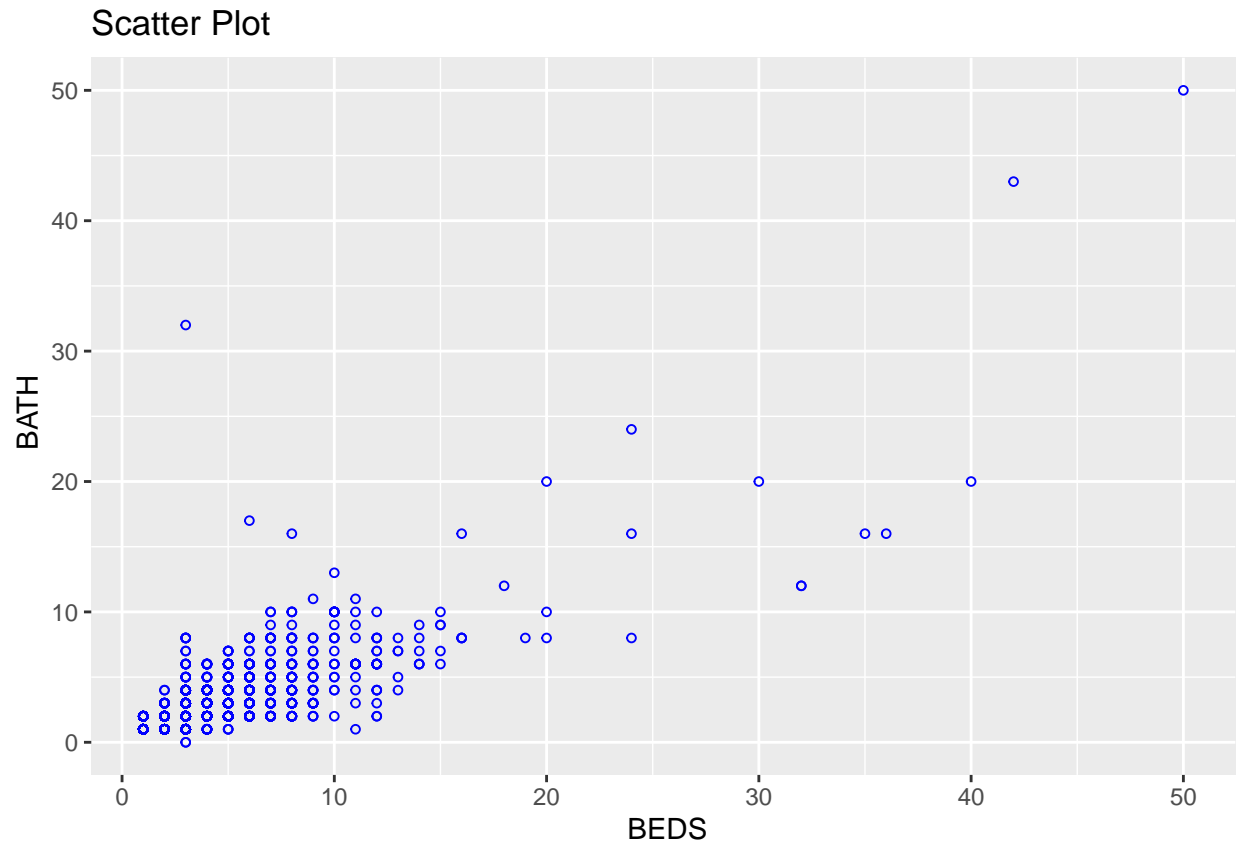
```
## [1] "range: 2494"          "range: 2147483647"
```

```

library(dplyr)
library(tidyr)
library(ggplot2)
#Plot a scatter plot for any 2 variables in your dataset

ggplot(NY.House.Dataset, aes(x = BEDS, y = BATH)) +
geom_point(size = 1.2, color = "blue", shape = 21) + labs(x = " BEDS", y = " BATH", title = "Scatter Pl

```



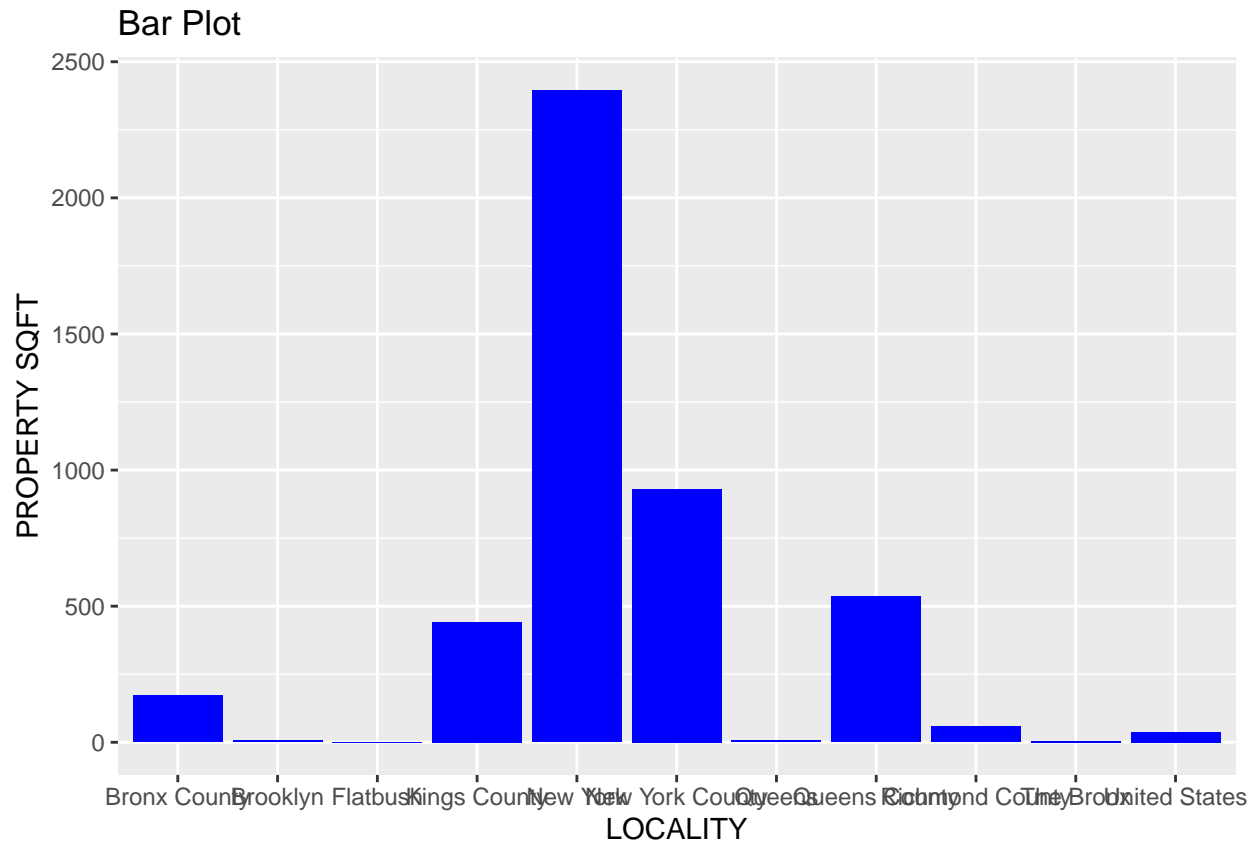
```
# Plot a bar plot for any 2 variables in your dataset
```

```
library(dplyr)
```

```
library(tidyr)
```

```
library(ggplot2)
```

```
ggplot(NY.House.Dataset, aes(x = LOCALITY, fill = PROPERTYSQFT)) + geom_bar(fill = "blue") + labs(x = "LOCALITY", y = "COUNT")
```



```
#Find the correlation between any 2 variables by applying least square linear regression model
library(dplyr)
library(tidyr)
library(ggplot2)
ggplot(NY.House.Dataset, aes(x = LATITUDE, y = LONGITUDE)) +
  geom_smooth(method = "lm", se = FALSE) +
  labs(x = "LATITUDE", y = "LONGITUDE", title = "Linear Regression Correlation Plot")
```

```
## 'geom_smooth()' using formula = 'y ~ x'
```

Linear Regression Correlation Plot

