

# Assignment1

Pooja Nagaraju

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##The following link contains the link to the Dataset source: <https://www.kaggle.com/datasets/reenapinto/electric-vehicle-population-data/data>

The following packages were installed to run the following code.

Loading the dataset :

```
#evp <- load("~/mydataset.RData")
#head(evp)
evp <- read_excel("evp.xls")
head(evp)

## # A tibble: 6 x 17
##   'VIN (1-10)' County   City   State 'Postal Code' 'Model Year' Make   Model
##   <chr>         <chr>   <chr>   <chr>      <dbl>      <dbl> <chr> <chr>
## 1 3C3CFFGE4E   Yakima   Yakima   WA          98902        2014 FIAT   500
## 2 5YJXCBE40H   Thurston Olympia WA          98513        2017 TESLA MODEL X
## 3 3MW39FS03P   King     Renton   WA          98058        2023 BMW   330E
## 4 7PDSGABA8P   Snohomish Bothell WA          98012        2023 RIVIAN R1S
## 5 5YJ3E1EB8L   King     Kent     WA          98031        2020 TESLA MODEL 3
## 6 5UX43EU02R   Kitsap   Poulsbo WA          98370        2024 BMW   X5
## # i 9 more variables: 'Electric Vehicle Type' <chr>,
## #   'Clean Alternative Fuel Vehicle (CAFV) Eligibility' <chr>,
## #   'Electric Range' <dbl>, 'Base MSRP' <dbl>, 'Legislative District' <dbl>,
## #   'DOL Vehicle ID' <dbl>, 'Vehicle Location' <chr>, 'Electric Utility' <chr>,
## #   '2020 Census Tract' <dbl>
```

The `quantitative_var` shows the descriptive statistics for the quantitative variables “Electric Range” and “Base MSRP” which includes the summary for the same

```
quantitative_var <- c("Electric Range", "Base MSRP")
summary(evp[quantitative_var])
```

```
##   Electric Range      Base MSRP
##   Min.   : 0.00   Min.   :    0
##   1st Qu.: 0.00   1st Qu.:    0
##   Median : 0.00   Median :    0
##   Mean   : 61.79   Mean   : 1159
##   3rd Qu.: 84.00   3rd Qu.:    0
##   Max.   :337.00   Max.   :184400
```

{r catvar} shows the descriptive statistics for the categorical variable “Electric Vehicle Type”, “State”, “Make”, “Model”) which gives the summary for the same

```
categorical_var<- c("Electric Vehicle Type", "State","Make","Model")
for(var in categorical_var){
  cat(paste("summary for", var, ":\n"))
  print(table(evp[var]))
}
```

```
## summary for Electric Vehicle Type :
## Electric Vehicle Type
##      Battery Electric Vehicle (BEV) Plug-in Hybrid Electric Vehicle (PHEV)
##                                51704                                13831
## summary for State :
## State
##      AE      BC      WA
##      1      1 65533
## summary for Make :
## Make
##      ALFA ROMEO      AUDI      AZURE DYNAMICS
##              17      1440      2
##      BENTLEY      BMW      CADILLAC
##              1      3059      83
##      CHEVROLET      CHRYSLER      DODGE
##              4735      1171      7
##      FIAT      FISKER      FORD
##              353      9      2699
##      GENESIS      GMC      HONDA
##              60      2      281
##      HYUNDAI      JAGUAR      JEEP
##              1612      92      1823
##      KIA      LAND ROVER      LEXUS
##              2635      13      119
##      LINCOLN      LUCID      MAZDA
##              62      93      116
##      MERCEDES-BENZ      MINI      MITSUBISHI
##              575      383      306
##      NISSAN      POLESTAR      PORSCHE
##              5409      378      464
##      RIVIAN      SMART      SUBARU
##              1402      106      407
##      TESLA      THINK      TOYOTA
##              30008      2      2121
##      VOLKSWAGEN      VOLVO WHEEGO ELECTRIC CARS
##              1786      1703      1
## summary for Model :
## Model
##              330E      500      530E
##              165      353      172
##              740E      745E      A3
##              8      4      264
##              A7      A8 E      ACCORD
##              3      1      3
##              AIR      ARIYA      AVIATOR
```

##	93	181	40
##	B-CLASS	BLAZER EV	BOLT EUV
##	55	4	696
##	BOLT EV	BZ4X	C-CLASS
##	2431	71	9
##	C-MAX	C40	CAYENNE
##	473	153	152
##	CITY	CLARITY	CORSAIR
##	2	278	22
##	COUNTRYMAN	CROSSTREK	CT6
##	89	20	3
##	CX-90	E-GOLF	E-TRON
##	115	452	414
##	E-TRON GT	E-TRON SPORTBACK	EDV
##	52	55	53
##	ELR	EQ FORTWO	EQB-CLASS
##	23	23	112
##	EQE-CLASS SEDAN	EQE-CLASS SUV	EQS-CLASS SEDAN
##	32	98	72
##	EQS-CLASS SUV	ESCAPE	EV6
##	89	137	726
##	EV9	F-150	FLYING SPUR
##	2	367	1
##	FOCUS	FORTWO	FORTWO ELECTRIC DRIVE
##	69	27	56
##	FUSION	G80	GLC-CLASS
##	516	13	89
##	GLE-CLASS	GRAND CHEROKEE	GV60
##	15	358	40
##	GV70	HARDTOP	HORNET
##	7	294	7
##	HUMMER EV PICKUP	I-MIEV	I-PACE
##	2	20	92
##	I3	I4	I5
##	828	432	7
##	I7	I8	ID.4
##	1	26	1334
##	IONIQ	IONIQ 5	IONIQ 6
##	87	847	91
##	IX	KARMA	KONA
##	280	4	91
##	KONA ELECTRIC	LEAF	LYRIQ
##	326	5228	57
##	MODEL 3	MODEL S	MODEL X
##	11575	2962	2267
##	MODEL Y	MUSTANG MACH-E	MX-30
##	13180	1046	1
##	NIRO	NX	OCEAN
##	1264	67	5
##	OPTIMA	OUTLANDER	PACIFICA
##	39	286	1171
##	PANAMERA	PRIUS	PRIUS PLUG-IN
##	52	28	341
##	PRIUS PRIME	PS2	Q4

##	935	378	194
##	Q5	Q5 E	Q8
##	60	296	86
##	R1S	R1T	RANGE ROVER
##	743	606	2
##	RANGE ROVER SPORT	RANGER	RAV4
##	11	4	22
##	RAV4 PRIME	ROADSTER	RS E-TRON GT
##	724	24	14
##	RZ 450E	S-CLASS	S60
##	52	4	57
##	S90	SANTA FE	SOLTERRA
##	10	72	387
##	SONATA	SORENTO	SOUL
##	24	183	148
##	SOUL EV	SPARK	SPORTAGE
##	88	91	185
##	SQ8	TAYCAN	TONALE
##	1	260	17
##	TRANSIT TRANSIT CONNECT ELECTRIC		TUCSON
##	87	2	74
##	V60	VOLT	WHEEGO
##	17	1513	1
##	WRANGLER	X3	X5
##	1465	142	994
##	XC40	XC60	XC90
##	437	438	591

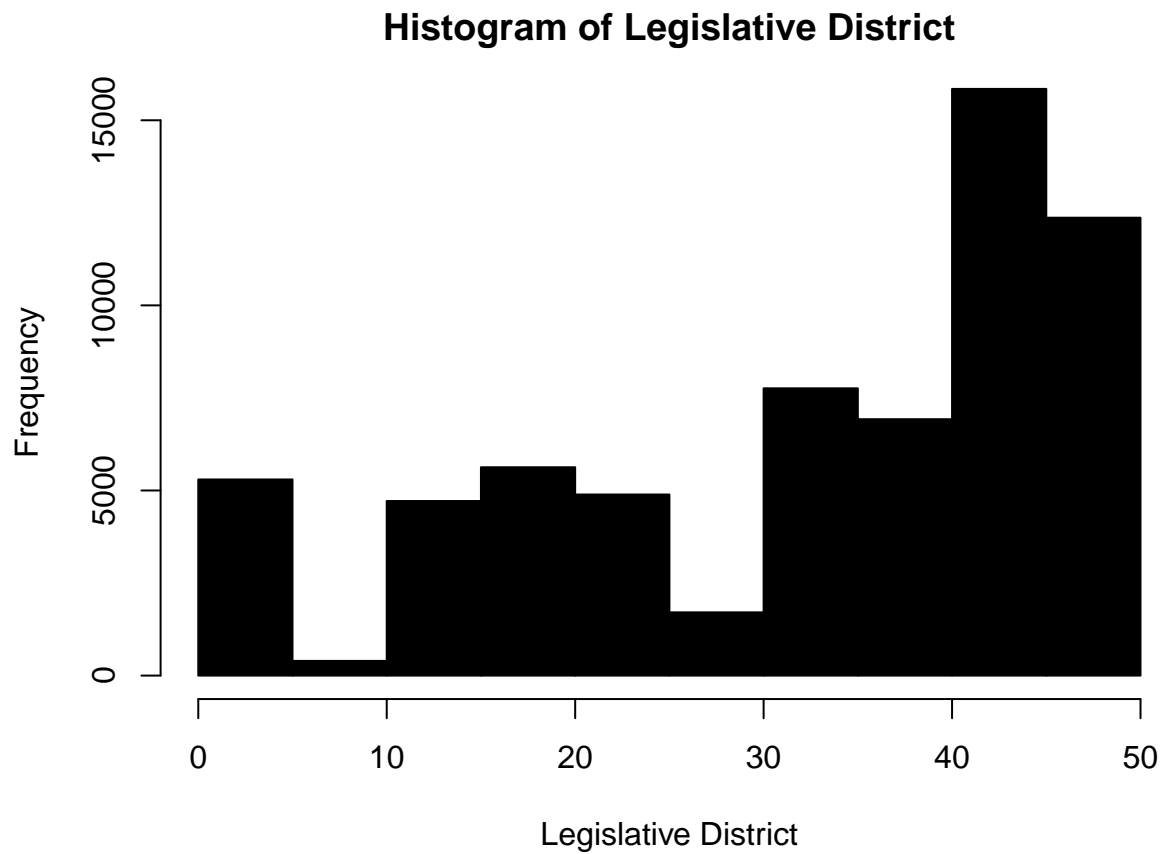
{r transform} depicts the transformation for the variable “Electric Range” which depicts the results after the number are squared from the original variable.

```
evp$transformed_var<-evp$'Electric Range'^2
head(evp)
```

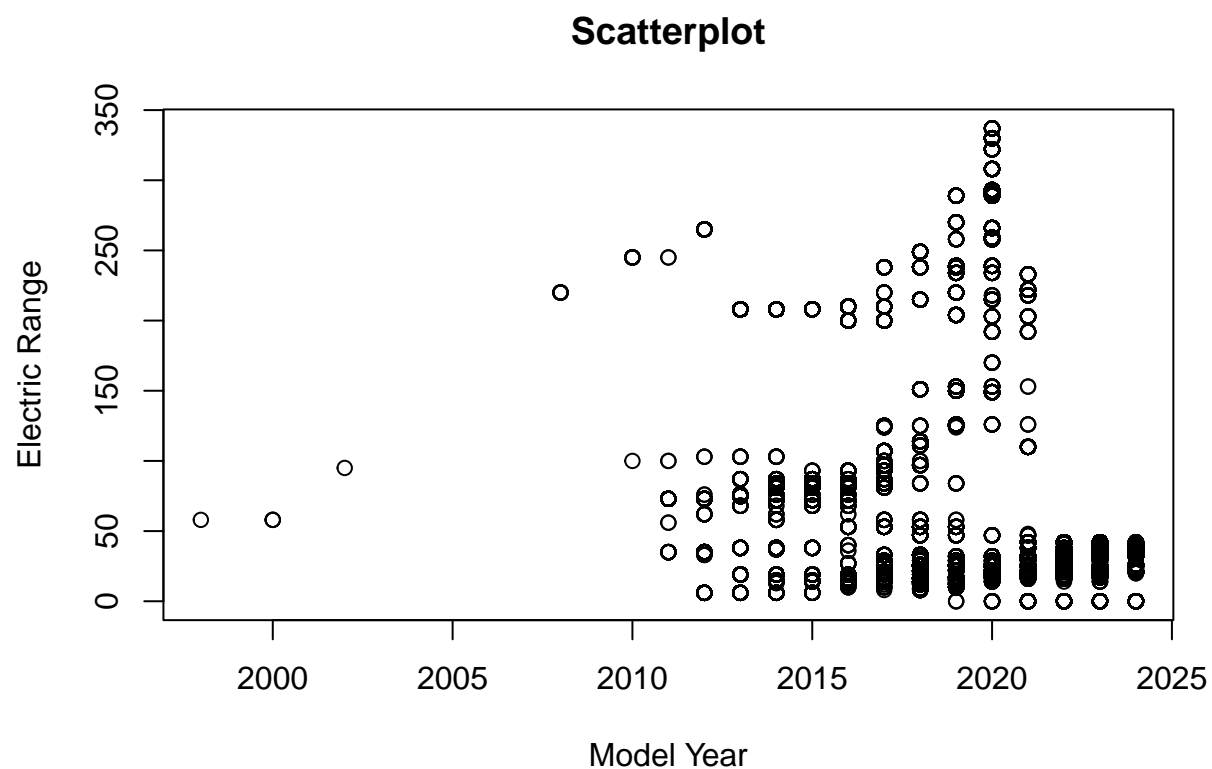
```
## # A tibble: 6 x 18
##   'VIN (1-10)' County   City   State 'Postal Code' 'Model Year' Make   Model
##   <chr>         <chr>   <chr>  <chr>    <dbl>        <dbl> <chr>  <chr>
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## #   'DOL Vehicle ID' <dbl>, 'Vehicle Location' <chr>, 'Electric Utility' <chr>,
## #   '2020 Census Tract' <dbl>, transformed_var <dbl>
```

{r hist} This command contains the histogram graph for Legislative District which is a quantitative variable

```
par(mar=c(4,4,2,2))
hist(evp$'Legislative District', main="Histogram of Legislative District",xlab="Legislative District",col="black",lty="n",las=1)
```



## Including Plots The final command shows the scatterplot which has the X axis label = “Model Year”, and y axis label “Electric Range”)



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.