Machine Learning - Assignment 1

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```
Laya_dataset <- read.csv("C:/Users/gauth/OneDrive/Desktop/Kent State University/volcanic-eruptions.csv")
#Following is the dataset that has been imported. The dataset represents Volcanic eruptions by countries
View(Laya_dataset)
```

```
mean(Laya_dataset$Latitude)
```

```
## [1] 15.38975
```

```
sd(Laya_dataset$Latitude)
```

```
## [1] 25.80702
```

```
# The above values represent descriptive statistics for a selection of quantitative  variables. The abo
```

```
table(Laya_dataset$Location)
```

```
##
## Admiralty Is-SW Paci             Africa-C             Africa-E
##                    2                    5                    5
##            Africa-NE             Africa-W             Alaska-E
##                    6                    3                    2
##            Alaska-SW     Alaska Peninsula          Aleutian Is
##                    6                    3                    8
##           Antarctica             Arabia-S             Arabia-W
##                    1                    2                    1
##               Azores            Banda Sea Bougainville-SW Paci
##                    6                   10                    3
##               Canada            Canary Is        Cape Verde Is
##                    1                    4                    3
##              Chile-C             Chile-Is              Chile-S
##                    9                    1                    9
##              China-E             China-S             Colombia
##                    1                    1                   10
##           Costa Rica             Ecuador          El Salvador
##                    6                   22                    6
##            Galapagos              Greece            Guatemala
##                    1                    8                   19
##  Halmahera-Indonesia          Hawaiian Is       Hokkaido-Japan
##                   17                   20                   17
```

```
##         Honshu-Japan           Iceland-NE            Iceland-S
##                   51                   16                   33
##           Iceland-SE           Iceland-SW           Indian O-W
##                    3                    1                    7
##            Indonesia                Italy         Izu Is-Japan
##                    8                   57                   19
##                 Java            Kamchatka          Kermadec Is
##                  101                   14                    2
##             Kuril Is         Kyushu-Japan      Lesser Sunda Is
##                    6                   44                   25
##           Luzon-N of    Luzon-Philippines Mariana Is-C Pacific
##                    1                   35                    2
##               Mexico Mindanao-Philippines   New Britain-SW Pac
##                   12                    7                   12
##           New Guinea     New Guinea-NE of          New Zealand
##                    2                   19                   11
##            Nicaragua                Peru        Philippines-C
##                    7                    4                    1
##              Red Sea            Ryukyu Is     Samoa-SW Pacific
##                    2                    3                    3
## Sangihe Is-Indonesia Santa Cruz Is-SW Pac              SE Asia
##                   21                    4                    1
## Solomon Is-SW Pacifi   Sulawesi-Indonesia              Sumatra
##                    3                    6                   15
##          Taiwan-E of     Tonga-SW Pacific             Trinidad
##                    1                    4                    1
##               Turkey            US-Oregon        US-Washington
##                    1                    2                    2
##           US-Wyoming   Vanuatu-SW Pacific              W Indies
##                    1                   17                   17
```

```
str(Laya_dataset$Country)
```

```
##  chr [1:822] "United States" "United States" "Greece" "United States" ...
```

```
# The above values represent categorical descriptive analysis of the variables.
```

```
Layadataset_Trasnformed = (Laya_dataset$Latitude - mean(Laya_dataset$Latitude)/sd(Laya_dataset$Latitude)
Layadataset_Trasnformed
```

```
##   [1]  55.57366024  56.28366024  35.80766024  59.88366024 -39.41633976
##   [6]  -6.17633976  14.53366024  -2.06333976  -1.27333976 -29.86633976
##  [11]  35.80766024  -2.97633976  37.13766024  52.82366024  11.64566024
##  [16]  35.80766024 -16.84633976  60.78366024  40.22466024  15.03366024
##  [21] -39.41633976  51.20366024  58.77366024  -6.69833976  13.07566024
##  [26]  15.03366024  13.13966024  26.48366024  -5.65233976  -4.86733976
##  [31]  -6.17633976  30.98366024  30.98366024  40.22466024  60.78366024
##  [36]  63.03366024  20.52866024  63.03366024  63.03366024  41.38366024
##  [41]  35.80766024  63.38366024  63.33366024  63.38366024  37.13766024
##  [46]  37.13766024  63.03366024  63.38366024   8.37866024  63.03366024
##  [51]  -1.44633976  63.38366024  40.13366024  63.03366024  -8.52633976
##  [56]  37.13766024  37.13766024  32.28366024  -8.52633976  63.38366024
```

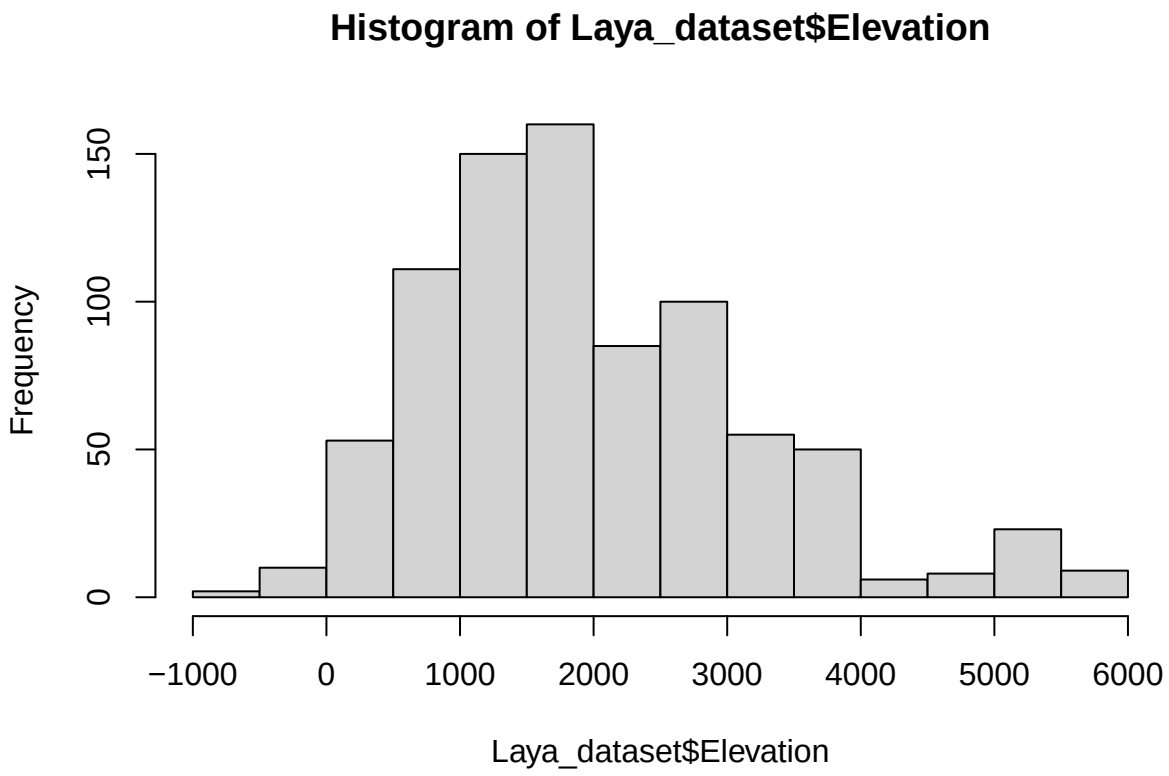
```
##  [61]  63.03366024  63.40366024  16.76366024  -8.52633976  -8.52633976
##  [66]  63.38366024  36.52366024 -17.42533976  30.98366024  64.03366024
##  [71]  32.28366024  63.03366024  63.38366024  63.38366024  37.13766024
##  [76]  40.23066024  58.77366024   1.08366024   0.77866024  13.78466024
##  [81]  31.33366024  -9.72633976  11.22966024  18.91766024  38.05366024
##  [86]  63.03366024  -6.68833976  13.87666024  -8.52633976  -8.13833976
##  [91]  18.91766024  -8.72133976   4.29866024  35.80366024  63.38366024
##  [96]  -8.72133976  35.80366024  -5.12133976 -17.20433976  32.53366024
## [101]   0.20366024  24.72366024  -5.12133976  13.87666024  63.03366024
## [106]  63.82366024  37.17366024  10.68366024  40.22466024  63.38366024
## [111]  -8.72133976  41.47366024  -2.06333976  -0.27633976  35.80766024
## [116]  13.13966024  -7.51633976  -7.51633976  63.03366024  -5.95433976
## [121]  41.93366024  32.15366024  27.25366024  37.13766024  37.13766024
## [126] -15.99633976  38.00366024  -8.13833976   0.77866024  27.98366024
## [131]  13.42366024  40.22466024  63.82366024  40.22466024  -7.72633976
## [136]  -6.89633976  37.13766024  63.38366024  -5.12133976  40.22466024
## [141]  -7.48833976  -1.27333976  27.67466024  35.80766024  34.75366024
## [146]   3.07366024  64.03366024  40.22466024  -8.52633976  13.40566024
## [151]  64.03366024  31.33366024  31.33366024  64.03366024  13.87666024
## [156]  37.87366024  63.03366024  35.80366024  64.03366024  63.40366024
## [161]  64.03366024  65.13366024  28.43366024  -8.72133976  54.52366024
## [166]  40.22466024  40.90366024  -1.27333976  -1.27333976  13.40566024
## [171]  63.82366024  13.40566024  63.03366024  38.05366024  -0.27633976
## [176]  55.46066024  63.38366024  12.66066024  -1.27333976   0.20366024
## [181]  -7.91633976   0.20366024   0.20366024   0.76166024  47.69566024
## [186]  40.22466024  30.98366024  30.98366024  31.85366024  30.98366024
## [191]  30.98366024  30.98366024  35.80366024  63.82366024 -16.37633976
## [196]  19.09566024  31.85366024  -7.79633976  34.13366024  18.82866024
## [201]  32.15366024  40.22466024  38.05366024  -7.72633976  12.66066024
## [206]  -9.82633976  45.60366024  19.09566024  38.48366024  35.80366024
## [211]  35.80366024  42.10366024  40.22466024  12.73366024   3.07366024
## [216]  40.22466024  12.66066024  -8.84633976  32.28366024  -8.65433976
## [221]  -8.72133976  18.91766024  19.07366024  53.92366024  -5.12133976
## [226]  41.93366024  -7.84633976  -8.13833976  18.82866024  54.15366024
## [231]  -6.42633976  -8.52633976  -7.79633976  32.28366024  52.65866024
## [236]  52.65866024  -7.72633976  37.13766024  -8.13833976  -4.11633976
## [241]  12.38366024  -5.12133976   4.31766024   0.20366024 -34.21633976
## [246]   0.20366024  18.82866024  39.10366024  -9.72633976 -10.97633976
## [251]  29.83366024  16.77366024  15.45366024  -8.59633976  37.13766024
## [256]   0.51166024   4.29866024  63.38366024 -39.41633976  -7.36633976
## [261]  41.20366024  14.35366024  -7.79633976  -8.52633976  -4.86733976
## [266] -16.19633976  12.66066024  23.40366024  56.05666024  32.28366024
## [271]  50.26166024   3.07366024  54.15366024  41.47366024  -6.18533976
## [276]  12.66066024  35.97366024  35.97366024  -8.70433976  13.87666024
## [281]  63.82366024  12.98366024  63.82366024  -0.27633976 -20.11633976
## [286]  -8.52633976  35.80766024 -14.77133976  37.55366024  18.87866024
## [291]  37.13766024  -9.12633976  -8.59633976   1.68366024  -9.13633976
## [296] -15.99633976   1.68366024   8.60666024   0.20366024  12.66066024
## [301]  -8.13833976  -8.13833976  40.22466024  -8.13833976  32.28366024
## [306]  48.27866024   7.07366024  40.22466024  33.48366024  13.40566024
## [311]  -8.52633976  64.43366024  12.66066024  18.87866024  -1.27333976
## [316] -20.11633976  -4.86733976 -20.11633976  52.82366024  38.19266024
## [321] -12.34633976  -6.69833976  58.77366024  -6.69833976  -6.73633976
## [326]  -6.69833976  -8.70433976   1.72366024  -2.06333976 -38.71633976
```

```
## [331] -16.19633976  12.66066024  -6.11633976  37.00366024   2.54166024
## [336]  -0.27633976  -9.79633976   0.08966024   3.07366024 -20.34633976
## [341] -41.92233976  37.13366024 -16.84633976  -8.70433976  -5.24533976
## [346]  31.33366024  -5.65233976  31.33366024 -10.97633976  12.66066024
## [351]   0.87366024  -4.69633976  35.80366024  31.33366024  37.02366024
## [356]   7.56166024  -8.52633976 -17.27633976  14.22366024  12.73366024
## [361]  14.22366024  14.22366024  29.88366024  14.22366024  14.15966024
## [366]  -8.13833976 -38.71633976 -12.34633976 -12.34633976  40.22466024
## [371] -14.20833976  40.22466024 -21.97633976  12.28366024  -9.12633976
## [376] -14.20833976   3.60666024  -8.70433976 -39.41633976  41.93366024
## [381]  13.40566024  35.80366024  35.80366024   9.40366024  -8.70433976
## [386]  57.67366024  -2.00433976  18.91766024   3.07366024  35.80366024
## [391]  -8.70433976 -16.84633976  30.98366024  -6.17633976 -38.11633976
## [396] -15.99633976  -2.06333976  38.19266024  -3.34733976 -38.71633976
## [401] -41.92233976  13.13966024   2.54166024  63.03366024  18.42666024
## [406]   2.54166024  -8.52633976  38.19266024  36.52366024  18.87866024
## [411]  -8.13833976  13.21666024  36.52366024   9.56166024  -7.91633976
## [416]  -7.36633976  31.33366024  18.82866024  42.82366024  -8.91633976
## [421]  63.67366024  35.80766024  12.66066024  -6.69833976  -7.79633976
## [426]  -8.91633976  37.13766024 -41.92233976  41.47366024  37.13766024
## [431]  14.15966024  -6.69833976  35.80366024  38.19266024  -8.13833976
## [436]  35.80366024  13.87666024  -8.13833976  36.02366024  48.52366024
## [441]  34.62366024  29.83366024  12.17366024  44.77766024  35.80366024
## [446] -39.28833976  -4.86733976  -2.00433976  37.00366024  12.66066024
## [451]  35.80366024  11.70366024  29.88366024  -7.79633976   2.18366024
## [456]  33.48366024  -3.34733976  35.80366024  -8.70433976  18.88366024
## [461]  -1.49633976  40.22466024  52.22366024  41.93366024  38.19266024
## [466]  41.93366024  -7.79633976  30.98366024  -8.70433976  -8.70433976
## [471]  47.49566024  12.66066024  35.80366024  35.93366024  63.38366024
## [476]  -9.13633976 -40.01633976   1.72366024   8.60666024  -8.70433976
## [481]   8.60666024  35.80366024  -9.54633976  12.38366024  -8.52633976
## [486]  34.62366024   8.60666024  -9.61633976  34.62366024  31.50366024
## [491]  31.50366024  31.50366024  31.50366024  16.72366024  31.50366024
## [496]  -8.13833976  31.50366024  32.28366024  -2.97633976  -9.10633976
## [501]  34.62366024  34.13366024 -39.87633976  38.19266024  35.97366024
## [506]  -4.19633976   8.60666024 -40.94633976  30.98366024  55.38166024
## [511]  52.53366024  32.15366024  34.13366024  32.28366024   0.76166024
## [516]  43.08366024 -17.42533976 -41.18633976 -41.92233976  35.97366024
## [521]  -8.13833976  43.08366024  35.80366024  42.82366024  -8.13833976
## [526]   0.20366024   9.38266024  -8.93833976  -8.70433976  -8.93833976
## [531] -40.01633976  -8.83833976  13.87666024   9.38266024  -8.91633976
## [536] -40.01633976  -7.79633976  13.40566024  11.70366024 -10.97633976
## [541]  -8.52633976   3.07366024  -3.34733976  -3.34733976  -8.70433976
## [546] -63.56633976  12.66066024   9.86666024  -8.13833976  -9.47633976
## [551]  18.48066024  38.13366024  40.23066024  63.38366024 -46.49633976
## [556] -10.97633976  13.87666024  27.98366024 -40.01633976  36.02366024
## [561] -21.82533976  34.62366024  -6.11633976  62.83366024  -8.91633976
## [566] -46.49633976  -9.13633976   2.18366024  30.98366024  36.32366024
## [571]  30.98366024  13.87666024  -6.11633976  -8.13833976  -0.97733976
## [576]   9.86666024  18.82866024  36.02366024  -2.62633976  -8.70433976
## [581]   2.18366024  -8.13833976  -2.11633976 -12.34633976  65.13366024
## [586]  55.46066024  41.93366024  41.93366024  12.17366024  14.15966024
## [591]  -8.70433976  -7.36633976  -7.79633976  -5.24533976  12.73366024
## [596]  37.13766024  -9.13633976  32.28366024  45.60366024  63.38366024
```

```
## [601]  44.77766024  37.13766024  -8.70433976  50.26166024  -8.70433976
## [606]  12.66066024  -8.91633976  52.08366024  16.76366024  16.76366024
## [611]  -7.84633976  16.76366024  55.46066024  -0.76633976  -9.13633976
## [616]  33.48366024   5.65366024  12.66066024  35.30366024  37.13766024
## [621]  -8.70433976   4.29866024  37.13766024  39.37366024  38.19266024
## [626]   5.65366024  -8.13833976  34.13366024  13.78466024  37.13766024
## [631]  -9.10633976  -5.12133976   9.86666024  -8.70433976 -38.97333976
## [636]  39.37366024  32.28366024  31.33366024  56.05666024  -8.52633976
## [641]  32.28366024  32.28366024 -16.37633976  -4.86733976  14.15966024
## [646]  32.28366024  -2.11633976  -8.52633976  32.15366024  14.53366024
## [651]  51.85666024 -12.34633976 -46.49633976   0.76166024  37.13766024
## [656]   2.18366024  -7.79633976  11.90966024   2.18366024  -0.97733976
## [661]  14.53366024  60.70366024  -8.70433976   0.62366024  -7.72133976
## [666]  12.66066024  -0.76733976  18.82866024  -6.69833976  32.15366024
## [671]  14.53366024  14.53366024 -20.11633976  -8.70433976  32.28366024
## [676]   2.32366024  -4.86733976  -9.01633976  -8.13833976 -20.11633976
## [681]  35.62366024  14.35366024  13.78466024  -9.35433976   5.52366024
## [686]  53.45366024  18.42666024   9.81566024  10.84966024  63.82366024
## [691]  -4.69633976  -8.13833976   2.18366024  16.12366024  40.05366024
## [696]  16.12366024  -8.70433976  37.02366024  32.28366024  16.12366024
## [701]  18.82866024  -8.52633976  12.10566024  16.12366024  13.87666024
## [706]  56.05666024  -0.76733976  -2.06333976  33.48366024  -8.70433976
## [711]   9.86666024  18.82866024  -8.13833976  37.13766024  37.13766024
## [716]  -8.13833976  38.19266024   2.18366024  -2.11633976  37.13766024
## [721]  -0.67433976  38.19266024  -8.70433976  16.12366024  -9.26633976
## [726]  -8.53833976  -4.69633976  -4.69633976  13.25666024 -12.34633976
## [731] -29.86633976  16.12366024  12.17366024  -8.13833976  -2.06333976
## [736]  -2.06333976  12.66066024  -4.69633976   2.32366024  -7.31633976
## [741]  15.10366024 -43.42933976  51.58366024  -2.06333976   2.32366024
## [746]  59.88366024  18.82866024  -2.06333976  63.03366024  13.78466024
## [751]  16.11166024   2.18366024   2.57366024  -8.13833976  -2.06333976
## [756]  -8.53833976  -8.13833976  31.33366024  12.17366024   2.18366024
## [761]  -2.06333976 -41.18633976  12.77366024  63.03366024   0.76166024
## [766]   0.20366024  18.82866024  18.82866024  55.23366024  -8.13833976
## [771]  -8.91633976  12.66066024  -8.91633976 -16.95133976  30.98366024
## [776]   2.57366024 -38.71633976   2.57366024  -8.52633976  35.30366024
## [781]  18.82866024  14.35366024   0.20366024   2.57366024 -41.92233976
## [786]   2.18366024  -4.69633976   2.57366024 -38.71633976   2.57366024
## [791]   2.57366024  43.83366024  -9.01633976  32.28366024  37.13766024
## [796]   2.57366024  13.87666024  -7.79633976  40.23066024 -15.99633976
## [801]  -8.13833976   2.57366024  -4.21633976  12.66066024  36.02366024
## [806]  18.82866024  -4.21633976  -8.65433976 -15.99633976  18.82866024
## [811]  13.87666024  18.82866024  -4.69633976 -16.84633976  -6.69833976
## [816]  37.13766024  -4.69633976   2.57366024  -5.64633976  -4.69633976
## [821]  38.19266024  38.19266024
```

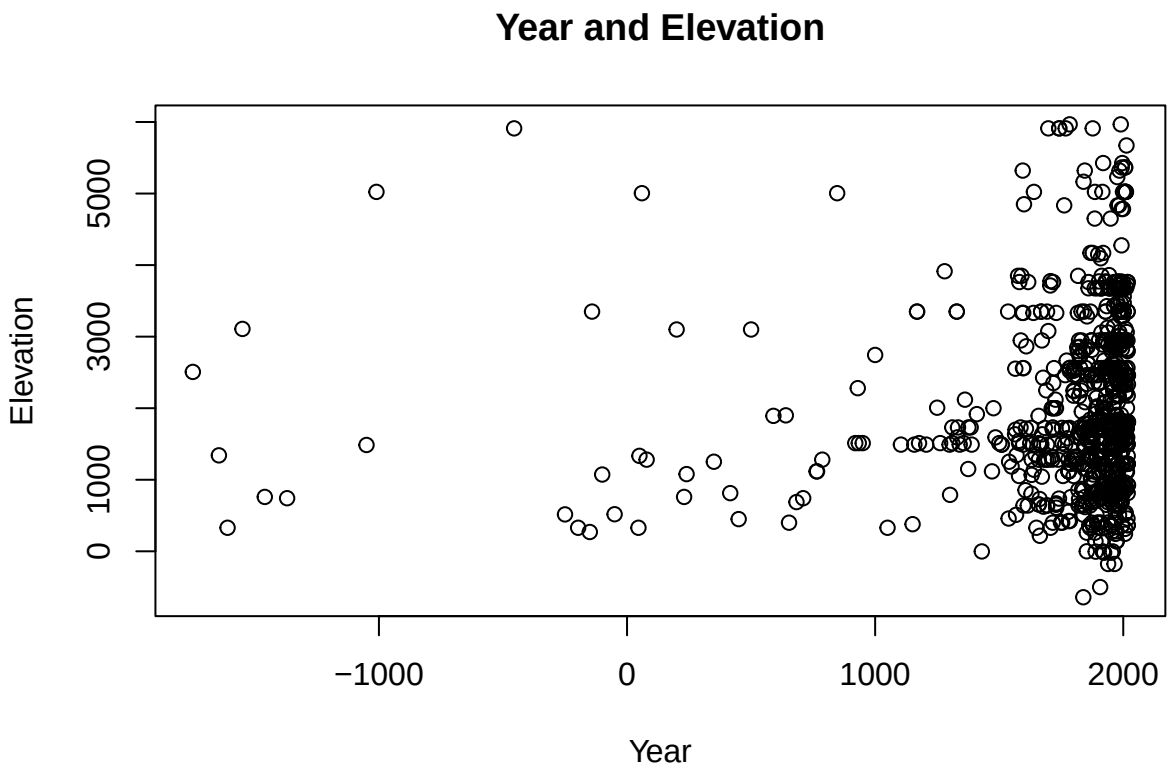
```
#Transformation of variables has been done above.
```

```
hist(Laya_dataset$Elevation)
```




```
#The above graphical representation is a histogram.  The selected variable is the Elevation.
```

```
x <- Laya_dataset$Year
y <- Laya_dataset$Elevation
plot(x,y, main = "Year and Elevation", xlab = "Year",ylab = "Elevation")
```




```
#The above graphical representation is a scatterplot.
#The selected variables are Year and Elevation
```