

IP week 12

2022-05-30

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

Defining the question

Identifying which individuals are most likely to click on an online cryptography course

Defining the metric of success

The metric of success for this project will be identifying which individuals click on the course

Understanding the context

A Kenyan entrepreneur has created an online cryptography course and would want to advertise it on her blog. She currently targets audiences originating from various countries. She would now like to employ your services as a Data Science Consultant to help her identify which individuals are most likely to click on her ads.

Recordingg the experimental design

1. Reading and understanding the data
2. Clean the dataset
3. Perform univariate and bivariate analysis
4. Find insights and give a recommendation

Data relevance

The data provided is valid

```
# Importing the dataset
df = read.csv("C:\\Users\\USER\\Documents\\Moringa School\\R Programming\\Fundermentals\\IP\\advertising.csv")

# Preview the top of the dataset
head(df)
```

```
##   Daily.Time.Spent.on.Site Age Area.Income Daily.Internet.Usage
## 1                68.95  35    61833.90                256.09
## 2                80.23  31    68441.85                193.77
## 3                69.47  26    59785.94                236.50
## 4                74.15  29    54806.18                245.89
## 5                68.37  35    73889.99                225.58
## 6                59.99  23    59761.56                226.74
##                                Ad.Topic.Line      City Male      Country
```

```
## 1    Cloned 5thgeneration orchestration    Wrightburgh    0    Tunisia
## 2    Monitored national standardization    West Jodi    1    Nauru
## 3    Organic bottom-line service-desk    Davidton    0    San Marino
## 4    Triple-buffered reciprocal time-frame    West Terrifurt    1    Italy
## 5    Robust logistical utilization    South Manuel    0    Iceland
## 6    Sharable client-driven software    Jamieberg    1    Norway
##      Timestamp Clicked.on.Ad
## 1 2016-03-27 00:53:11    0
## 2 2016-04-04 01:39:02    0
## 3 2016-03-13 20:35:42    0
## 4 2016-01-10 02:31:19    0
## 5 2016-06-03 03:36:18    0
## 6 2016-05-19 14:30:17    0
```

```
# Preview the bottom of the dataset
tail(df)
```

```
##      Daily.Time.Spent.on.Site Age Area.Income Daily.Internet.Usage
## 995          43.70  28    63126.96          173.01
## 996          72.97  30    71384.57          208.58
## 997          51.30  45    67782.17          134.42
## 998          51.63  51    42415.72          120.37
## 999          55.55  19    41920.79          187.95
## 1000         45.01  26    29875.80          178.35
##      Ad.Topic.Line      City Male
## 995    Front-line bifurcated ability    Nicholasland    0
## 996    Fundamental modular algorithm    Duffystad    1
## 997    Grass-roots cohesive monitoring    New Darlene    1
## 998    Expanded intangible solution    South Jessica    1
## 999    Proactive bandwidth-monitored policy    West Steven    0
## 1000    Virtual 5thgeneration emulation    Ronniemouth    0
##      Country      Timestamp Clicked.on.Ad
## 995    Mayotte 2016-04-04 03:57:48    1
## 996    Lebanon 2016-02-11 21:49:00    1
## 997    Bosnia and Herzegovina 2016-04-22 02:07:01    1
## 998    Mongolia 2016-02-01 17:24:57    1
## 999    Guatemala 2016-03-24 02:35:54    0
## 1000    Brazil 2016-06-03 21:43:21    1
```

```
# Check the shape of the dataset
dim(df)
```

```
## [1] 1000  10
```

```
# Checking the datatype in the dataset
str(df)
```

```
## 'data.frame':    1000 obs. of  10 variables:
## $ Daily.Time.Spent.on.Site: num  69 80.2 69.5 74.2 68.4 ...
## $ Age : int  35 31 26 29 35 23 33 48 30 20 ...
## $ Area.Income : num  61834 68442 59786 54806 73890 ...
## $ Daily.Internet.Usage : num  256 194 236 246 226 ...
## $ Ad.Topic.Line : chr  "Cloned 5thgeneration orchestration" "Monitored national standardi
## $ City : chr  "Wrightburgh" "West Jodi" "Davidton" "West Terrifurt" ...
## $ Male : int  0 1 0 1 0 1 0 1 1 1 ...
## $ Country : chr  "Tunisia" "Nauru" "San Marino" "Italy" ...
## $ Timestamp : chr  "2016-03-27 00:53:11" "2016-04-04 01:39:02" "2016-03-13 20:35:42"
```

```
## $ Clicked.on.Ad : int 0 0 0 0 0 0 0 1 0 0 ...
```

```
# Checking for missing values
```

```
colSums(is.na(df))
```

```
## Daily.Time.Spent.on.Site      Age      Area.Income
##           0           0           0
##   Daily.Internet.Usage      Ad.Topic.Line      City
##           0           0           0
##           Male      Country      Timestamp
##           0           0           0
##           Clicked.on.Ad
##           0
```

```
# Checking for duplicates in our dataset
```

```
duplicates_df = df[duplicated(df), ]
duplicates_df
```

```
## [1] Daily.Time.Spent.on.Site Age      Area.Income
## [4] Daily.Internet.Usage      Ad.Topic.Line      City
## [7] Male      Country      Timestamp
## [10] Clicked.on.Ad
## <0 rows> (or 0-length row.names)
```

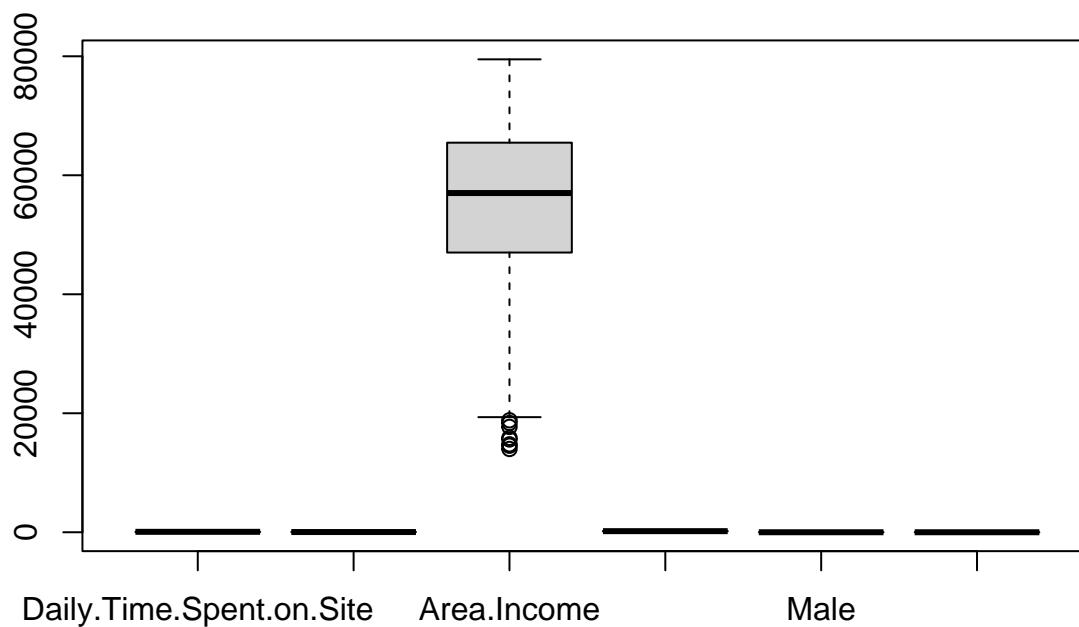
```
# Checking for outliers using the boxplot
```

```
# Outline the numeric columns
```

```
numeric <- df[,unlist(lapply(df, is.numeric))]
head(numeric)
```

```
##   Daily.Time.Spent.on.Site Age Area.Income Daily.Internet.Usage Male
## 1           68.95 35      61833.90           256.09 0
## 2           80.23 31      68441.85           193.77 1
## 3           69.47 26      59785.94           236.50 0
## 4           74.15 29      54806.18           245.89 1
## 5           68.37 35      73889.99           225.58 0
## 6           59.99 23      59761.56           226.74 1
##   Clicked.on.Ad
## 1           0
## 2           0
## 3           0
## 4           0
## 5           0
## 6           0
```

```
boxplot(numeric)
```



Univariate Analysis

Mean

```
summary(numeric)
```

```
##   Daily.Time.Spent.on.Site   Age   Area.Income   Daily.Internet.Usage
##   Min.   :32.60           Min.   :19.00   Min.   :13996   Min.   :104.8
##   1st Qu.:51.36           1st Qu.:29.00   1st Qu.:47032   1st Qu.:138.8
##   Median :68.22           Median :35.00   Median :57012   Median :183.1
##   Mean   :65.00           Mean   :36.01   Mean   :55000   Mean   :180.0
##   3rd Qu.:78.55           3rd Qu.:42.00   3rd Qu.:65471   3rd Qu.:218.8
##   Max.   :91.43           Max.   :61.00   Max.   :79485   Max.   :270.0
##           Male           Clicked.on.Ad
##   Min.   :0.000           Min.   :0.0
##   1st Qu.:0.000           1st Qu.:0.0
##   Median :0.000           Median :0.5
##   Mean   :0.481           Mean   :0.5
##   3rd Qu.:1.000           3rd Qu.:1.0
##   Max.   :1.000           Max.   :1.0
```

Checking the variance

```
var(numeric)
```

```
##           Daily.Time.Spent.on.Site           Age   Area.Income
##   Daily.Time.Spent.on.Site      251.3370949 -4.617415e+01  6.613081e+04
##   Age                          -46.1741459  7.718611e+01 -2.152093e+04
```

```
## Area.Income          66130.8109082 -2.152093e+04  1.799524e+08
## Daily.Internet.Usage  360.9918827 -1.416348e+02  1.987625e+05
## Male                 -0.1501864 -9.242142e-02  8.867509e+00
## Clicked.on.Ad        -5.9331431  2.164665e+00 -3.195989e+03
##                      Daily.Internet.Usage      Male Clicked.on.Ad
## Daily.Time.Spent.on.Site  3.609919e+02 -0.15018639 -5.933143e+00
## Age                     -1.416348e+02 -0.09242142  2.164665e+00
## Area.Income             1.987625e+05  8.86750903 -3.195989e+03
## Daily.Internet.Usage    1.927415e+03  0.61476667 -1.727409e+01
## Male                    6.147667e-01  0.24988889 -9.509510e-03
## Clicked.on.Ad          -1.727409e+01 -0.00950951  2.502503e-01
```

```
# Checking standard deviation
# For the age column
sd(df$Age)
```

```
## [1] 8.785562
```

```
# For the area income column
sd(df$Area.Income)
```

```
## [1] 13414.63
```

```
# For the internet usage column
sd(df$Daily.Internet.Usage)
```

```
## [1] 43.90234
```

```
# Frequency table for age column
table(df$Age)
```

```
##
## 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44
##  6  6  6 13 19 21 27 37 33 48 48 39 60 38 43 39 39 50 36 37 30 36 32 26 23 21
## 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61
## 30 18 13 16 18 20 12 15 10  9  7  2  6  4  2  4  1
```

```
# Frequency table for income column
```

```
table(df$Area.Income)
```

```
##
## 13996.5 14548.06 14775.5 15598.29 15879.1 17709.98 18368.57 18819.34
##      1      1      1      1      1      1      1      1
## 19345.36 19991.72 20592.99 20856.54 21644.91 21773.22 22205.74 22456.04
##      1      1      1      1      1      1      1      1
## 22473.08 23410.75 23821.72 23936.86 23942.61 23975.35 24030.06 24078.93
##      1      1      1      1      1      1      1      1
## 24316.61 24593.33 24852.9 25371.52 25408.21 25583.29 25598.75 25603.93
##      1      1      1      1      1      1      1      1
## 25682.65 25686.34 25739.09 25767.16 26023.99 26130.93 27073.27 27086.4
##      1      1      1      1      1      1      1      1
## 27241.11 27262.51 27508.41 27964.6 28019.09 28028.74 28186.65 28210.03
##      1      1      1      1      1      1      1      1
## 28265.81 28271.84 28275.48 28357.27 28387.42 28495.21 28679.93 29359.2
##      1      1      1      1      1      1      1      1
## 29398.61 29727.79 29875.8 30227.98 30487.48 30726.26 30976 31072.44
##      1      1      1      1      1      1      1      1
```

| | | | | | | | | |
|----|----------|----------|----------|----------|----------|----------|----------|----------|
| ## | 31087.54 | 31092.93 | 31215.88 | 31265.75 | 31281.01 | 31343.39 | 31523.09 | 31947.65 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 31998.72 | 32006.82 | 32252.38 | 32536.98 | 32549.95 | 32593.59 | 32635.7 | 32689.04 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 32708.94 | 32847.53 | 33147.19 | 33239.2 | 33258.09 | 33293.78 | 33502.57 | 33553.9 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 33601.84 | 33813.08 | 33951.63 | 33987.27 | 34127.21 | 34191.13 | 34191.23 | 34309.24 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 34418.09 | 34886.01 | 34903.67 | 34942.26 | 35253.98 | 35349.26 | 35350.55 | 35466.8 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 35521.88 | 35684.82 | 35764.49 | 36037.33 | 36424.94 | 36497.22 | 36752.24 | 36782.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 36834.04 | 36884.23 | 36913.51 | 37212.54 | 37334.78 | 37345.24 | 37345.34 | 37605.11 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 37713.23 | 37838.72 | 37908.29 | 38067.08 | 38260.89 | 38349.78 | 38427.66 | 38609.2 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 38641.2 | 38645.4 | 38745.29 | 38817.4 | 38987.42 | 39031.89 | 39131.53 | 39132.64 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 39193.45 | 39211.49 | 39552.49 | 39616 | 39699.13 | 39723.97 | 39799.73 | 39809.69 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 39840.55 | 39939.39 | 40135.06 | 40159.2 | 40182.84 | 40183.75 | 40243.82 | 40345.49 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 40468.53 | 40478.83 | 40763.13 | 40926.93 | 41059.64 | 41097.17 | 41229.16 | 41232.89 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 41335.84 | 41356.31 | 41417.27 | 41521.28 | 41547.62 | 41629.86 | 41768.13 | 41851.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 41866.55 | 41884.64 | 41920.79 | 42042.95 | 42078.89 | 42136.33 | 42162.9 | 42191.61 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 42251.59 | 42362.49 | 42415.72 | 42581.23 | 42650.32 | 42696.67 | 42760.22 | 42838.29 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 42861.42 | 42898.21 | 42907.89 | 42993.48 | 42995.8 | 43073.78 | 43111.41 | 43155.19 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 43241.19 | 43241.88 | 43299.63 | 43313.73 | 43386.07 | 43444.86 | 43450.11 | 43573.66 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 43662.1 | 43698.53 | 43708.88 | 43778.88 | 43870.51 | 43881.73 | 43974.49 | 44078.24 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 44174.25 | 44217.68 | 44248.52 | 44275.13 | 44304.13 | 44307.18 | 44490.09 | 44559.43 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 44893.71 | 45400.5 | 45465.25 | 45522.44 | 45580.92 | 45593.93 | 45632.51 | 45716.48 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 45800.48 | 45945.88 | 45959.86 | 46004.31 | 46024.29 | 46033.73 | 46132.18 | 46160.63 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 46179.97 | 46197.59 | 46239.14 | 46339.25 | 46403.18 | 46422.76 | 46473.14 | 46500.11 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 46557.92 | 46653.75 | 46693.76 | 46722.07 | 46737.34 | 46780.09 | 46868.53 | 46931.03 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 46964.11 | 46974.15 | 47051.02 | 47139.21 | 47160.53 | 47169.14 | 47258.59 | 47314.45 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 47338.94 | 47357.39 | 47391.95 | 47447.89 | 47510.42 | 47575.44 | 47638.3 | 47682.28 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 47708.42 | 47861.93 | 47929.83 | 47968.32 | 47997.75 | 48098.86 | 48206.04 | 48246.6 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 48335.2 | 48347.64 | 48376.14 | 48453.55 | 48467.68 | 48537.18 | 48554.45 | 48679.54 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

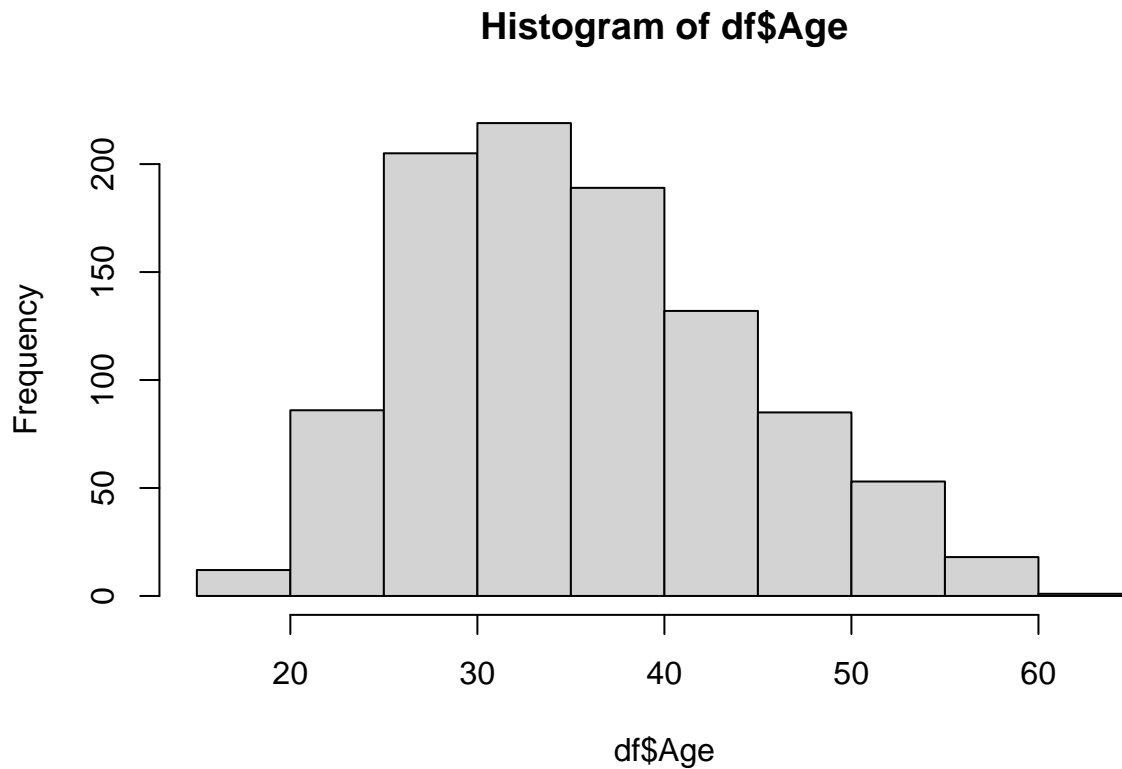
| | | | | | | | | |
|----|----------|----------|----------|----------|----------|----------|----------|----------|
| ## | 48758.92 | 48761.14 | 48826.14 | 48852.58 | 48867.36 | 48867.67 | 48913.07 | 48918.55 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 49030.03 | 49090.51 | 49101.67 | 49111.47 | 49158.5 | 49206.4 | 49269.98 | 49282.87 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 49309.14 | 49325.48 | 49457.48 | 49525.37 | 49544.41 | 49597.08 | 49742.83 | 49822.78 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 49850.52 | 49911.25 | 49942.66 | 49957 | 49995.63 | 50038.65 | 50055.33 | 50086.17 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 50147.72 | 50199.77 | 50216.01 | 50278.89 | 50333.72 | 50335.46 | 50337.93 | 50356.06 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 50439.49 | 50457.01 | 50468.36 | 50491.45 | 50506.44 | 50628.31 | 50666.5 | 50671.6 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 50711.68 | 50723.67 | 50760.23 | 50820.74 | 50950.24 | 50960.08 | 50971.73 | 50983.75 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 51013.37 | 51015.11 | 51049.47 | 51067.54 | 51119.93 | 51163.14 | 51171.23 | 51257.26 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 51315.38 | 51317.33 | 51363.16 | 51409.45 | 51463.17 | 51473.28 | 51501.38 | 51510.18 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 51512.66 | 51593.46 | 51600.47 | 51633.34 | 51636.12 | 51636.92 | 51662.24 | 51691.55 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 51739.63 | 51772.58 | 51812.71 | 51816.27 | 51824.01 | 51847.26 | 51864.77 | 51868.85 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 51869.87 | 51900.03 | 51920.49 | 51975.41 | 52011 | 52079.18 | 52097.32 | 52140.04 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 52177.4 | 52178.98 | 52182.23 | 52252.91 | 52261.73 | 52336.64 | 52340.1 | 52400.88 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 52416.18 | 52462.04 | 52520.75 | 52530.1 | 52563.22 | 52581.16 | 52656.13 | 52686.47 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 52691.79 | 52723.34 | 52736.33 | 52802 | 52802.58 | 52968.22 | 53012.94 | 53041.77 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 53042.51 | 53049.44 | 53058.91 | 53167.68 | 53185.34 | 53188.69 | 53223.58 | 53309.61 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 53336.76 | 53350.11 | 53412.32 | 53431.35 | 53441.69 | 53549.94 | 53575.48 | 53647.81 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 53673.08 | 53700.57 | 53767.12 | 53817.02 | 53852.85 | 53898.89 | 53922.43 | 54045.39 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 54106.21 | 54251.78 | 54286.1 | 54324.73 | 54429.17 | 54520.14 | 54541.56 | 54645.2 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 54725.87 | 54755.71 | 54773.99 | 54774.77 | 54787.37 | 54806.18 | 54875.95 | 54952.42 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 54989.93 | 55002.05 | 55015.08 | 55041.6 | 55121.65 | 55130.96 | 55187.85 | 55195.61 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 55316.97 | 55336.18 | 55353.41 | 55358.88 | 55368.67 | 55411.06 | 55424.24 | 55479.62 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 55499.69 | 55605.92 | 55642.32 | 55677.12 | 55764.43 | 55787.58 | 55901.12 | 55942.04 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 55984.89 | 55993.68 | 56067.38 | 56113.37 | 56129.89 | 56180.93 | 56194.56 | 56216.57 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 56242.7 | 56366.88 | 56369.74 | 56379.3 | 56394.82 | 56435.6 | 56457.01 | 56570.06 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 56593.8 | 56605.12 | 56637.59 | 56681.65 | 56683.32 | 56694.12 | 56725.47 | 56729.78 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 56735.14 | 56735.83 | 56759.48 | 56770.79 | 56782.18 | 56791.75 | 56884.74 | 56909.3 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | | |
|----|----------|----------|----------|----------|----------|----------|----------|----------|
| ## | 56974.51 | 56984.09 | 56986.73 | 57009.76 | 57014.84 | 57032.36 | 57179.91 | 57195.96 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 57260.41 | 57330.43 | 57425.87 | 57518.73 | 57519.64 | 57545.56 | 57587 | 57594.7 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 57667.99 | 57669.41 | 57691.95 | 57737.51 | 57739.03 | 57756.89 | 57777.11 | 57806.03 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 57844.96 | 57846.68 | 57868.44 | 57877.15 | 57887.64 | 57983.3 | 58019.64 | 58037.66 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 58114.3 | 58151.87 | 58183.04 | 58235.21 | 58287.86 | 58295.82 | 58337.18 | 58342.63 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 58348.41 | 58363.12 | 58443.99 | 58476.57 | 58526.04 | 58543.94 | 58576.12 | 58633.63 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 58638.75 | 58677.69 | 58776.67 | 58820.16 | 58847.07 | 58849.77 | 58909.36 | 58920.44 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 58953.01 | 58966.22 | 58996.12 | 58996.56 | 59047.91 | 59106.12 | 59144.02 | 59240.24 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 59243.46 | 59340.99 | 59397.89 | 59419.78 | 59422.47 | 59448.44 | 59457.52 | 59550.05 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 59593.56 | 59610.81 | 59621.02 | 59677.64 | 59683.16 | 59761.56 | 59784.18 | 59785.94 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 59797.64 | 59886.58 | 59967.19 | 59998.5 | 60015.57 | 60082.66 | 60151.77 | 60188.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 60192.72 | 60223.52 | 60248.97 | 60283.47 | 60283.98 | 60309.58 | 60315.19 | 60333.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 60372.64 | 60465.72 | 60514.05 | 60550.66 | 60575.99 | 60583.02 | 60637.62 | 60638.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 60641.09 | 60803 | 60803.37 | 60805.93 | 60812.77 | 60843.32 | 60845.55 | 60879.48 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 60938.73 | 60953.93 | 60968.62 | 60997.84 | 61004.51 | 61005.87 | 61009.1 | 61039.13 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 61067.58 | 61068.26 | 61117.5 | 61142.33 | 61161.29 | 61172.07 | 61227.59 | 61228.96 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 61230.03 | 61270.14 | 61275.18 | 61383.79 | 61389.5 | 61428.18 | 61467.33 | 61526.25 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 61601.05 | 61608.23 | 61610.05 | 61617.98 | 61625.87 | 61628.72 | 61652.53 | 61690.93 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 61747.98 | 61757.12 | 61770.34 | 61771.9 | 61806.31 | 61833.9 | 61840.26 | 61922.06 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 62053.37 | 62060.11 | 62109.8 | 62161.26 | 62204.93 | 62238.58 | 62312.23 | 62318.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 62330.75 | 62336.39 | 62378.05 | 62430.55 | 62463.7 | 62466.1 | 62475.99 | 62491.01 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 62572.88 | 62589.84 | 62657.53 | 62667.51 | 62669.59 | 62722.57 | 62729.4 | 62772.42 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 62784.85 | 62790.96 | 62792.43 | 62927.96 | 62939.5 | 63001.03 | 63006.14 | 63060.55 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 63071.34 | 63100.13 | 63102.19 | 63107.88 | 63109.74 | 63115.34 | 63126.96 | 63274.88 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 63296.87 | 63319.99 | 63336.85 | 63363.04 | 63373.7 | 63394.41 | 63429.18 | 63430.33 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 63450.96 | 63493.6 | 63497.62 | 63528.8 | 63551.67 | 63580.22 | 63649.04 | 63664.32 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 63727.5 | 63764.28 | 63879.72 | 63883.81 | 63891.29 | 63924.82 | 63936.5 | 63965.16 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | | |
|----|----------|----------|----------|----------|----------|----------|----------|----------|
| ## | 63966.72 | 63976.44 | 64008.55 | 64011.26 | 64021.55 | 64045.93 | 64122.36 | 64147.86 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 64188.5 | 64235.51 | 64238.71 | 64264.25 | 64267.88 | 64287.78 | 64395.85 | 64410.8 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 64433.99 | 64447.77 | 64564.07 | 64631.22 | 64654.66 | 64698.58 | 64775.1 | 64802.33 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 64828 | 64902.47 | 64927.19 | 64929.61 | 65044.59 | 65120.86 | 65172.22 | 65180.97 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 65186.58 | 65227.79 | 65229.13 | 65280.16 | 65421.39 | 65461.92 | 65496.78 | 65499.93 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 65576.05 | 65620.25 | 65653.47 | 65704.79 | 65756.36 | 65773.49 | 65791.17 | 65816.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 65826.53 | 65834.97 | 65856.74 | 65882.81 | 65883.39 | 65899.68 | 65953.76 | 65956.71 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 65963.37 | 66025.11 | 66027.31 | 66050.63 | 66107.84 | 66176.97 | 66187.58 | 66193.81 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 66198.66 | 66200.96 | 66217.31 | 66225.72 | 66262.59 | 66263.37 | 66265.34 | 66269.49 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 66281.46 | 66291.67 | 66345.1 | 66348.95 | 66359.32 | 66412.04 | 66429.84 | 66431.87 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 66504.16 | 66522.79 | 66524.8 | 66541.05 | 66572.39 | 66574 | 66618.21 | 66624.6 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 66629.61 | 66636.84 | 66691.23 | 66699.12 | 66744.65 | 66773.83 | 66784.81 | 66815.54 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 66861.67 | 66873.9 | 66929.03 | 66980.27 | 67033.34 | 67050.16 | 67058.72 | 67080.94 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 67113.46 | 67132.46 | 67186.54 | 67240.25 | 67279.06 | 67301.39 | 67307.43 | 67323 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 67384.31 | 67430.96 | 67432.49 | 67479.62 | 67511.86 | 67516.07 | 67526.92 | 67575.12 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 67633.44 | 67669.06 | 67682.32 | 67686.16 | 67714.82 | 67744.56 | 67781.31 | 67782.17 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 67866.95 | 67938.77 | 67990.84 | 68016.9 | 68030.18 | 68033.54 | 68094.85 | 68211.35 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 68305.91 | 68324.48 | 68333.01 | 68348.99 | 68357.96 | 68441.85 | 68447.17 | 68448.94 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 68519.96 | 68614.98 | 68713.7 | 68717 | 68737.75 | 68783.45 | 68787.09 | 68862 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 68863.95 | 68877.02 | 68962.32 | 69112.84 | 69285.69 | 69428.73 | 69438.04 | 69456.83 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 69476.42 | 69481.85 | 69562.46 | 69646.35 | 69710.51 | 69718.19 | 69758.31 | 69775.75 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 69784.85 | 69805.7 | 69868.48 | 69869.66 | 69874.18 | 70005.51 | 70012.83 | 70053.27 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 70179.11 | 70185.06 | 70203.74 | 70225.6 | 70232.95 | 70324.8 | 70377.23 | 70410.11 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 70449.04 | 70492.6 | 70495.64 | 70505.06 | 70510.59 | 70547.16 | 70575.6 | 70582.55 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 70592.81 | 70701.31 | 70783.94 | 70889.68 | 71055.22 | 71136.49 | 71157.05 | 71222.4 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 71228.44 | 71296.67 | 71384.57 | 71392.53 | 71455.62 | 71511.08 | 71718.51 | 71727.51 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 71881.84 | 72042.85 | 72154.68 | 72188.9 | 72196.29 | 72203.96 | 72209.99 | 72270.88 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

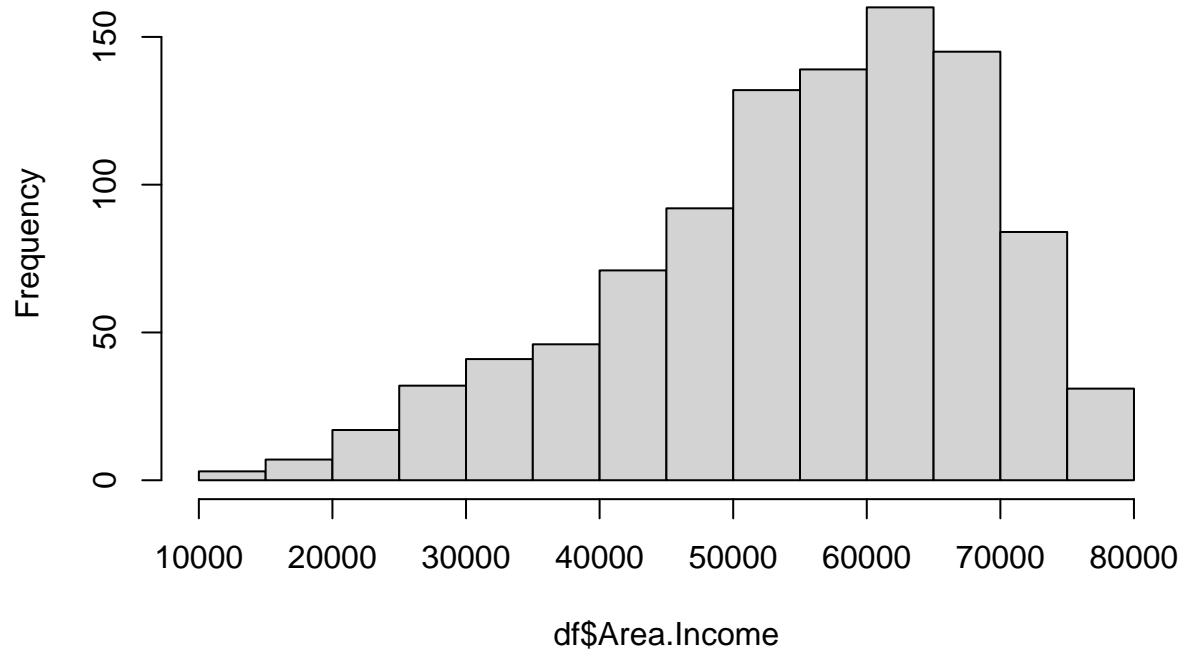
```
## 72272.9 72325.91 72330.57 72423.97 72524.86 72553.94 72683.35 72684.44
##      1      1      1      1      1      1      1      1
## 72707.87 72802.42 72948.76 73049.3 73104.47 73174.19 73207.15 73234.87
##      1      1      1      1      1      1      1      1
## 73347.67 73392.28 73413.87 73474.82 73538.09 73600.28 73608.99 73687.5
##      1      1      1      1      1      1      1      1
## 73863.25 73882.91 73884.48 73889.99 73910.9 73941.91 74024.61 74159.69
##      1      1      1      1      1      1      1      1
## 74166.24 74180.05 74430.08 74445.18 74535.94 74543.81 74623.27 74780.74
##      1      1      1      1      1      1      1      1
## 74903.41 75044.35 75180.2 75254.88 75265.96 75509.61 75524.78 75535.14
##      1      1      1      1      1      1      1      1
## 75560.65 75687.46 75769.82 75805.12 76003.47 76246.96 76368.31 76408.19
##      1      1      1      1      1      1      1      1
## 76435.3 76480.16 76560.59 76893.84 76984.21 77143.61 77220.42 77460.07
##      1      1      1      1      1      1      1      1
## 77567.85 77871.75 77988.71 78092.95 78119.5 78520.99 79332.33 79484.8
##      1      1      1      1      1      1      1      1
```

```
# Histogram showing the age
hist(df$Age)
```



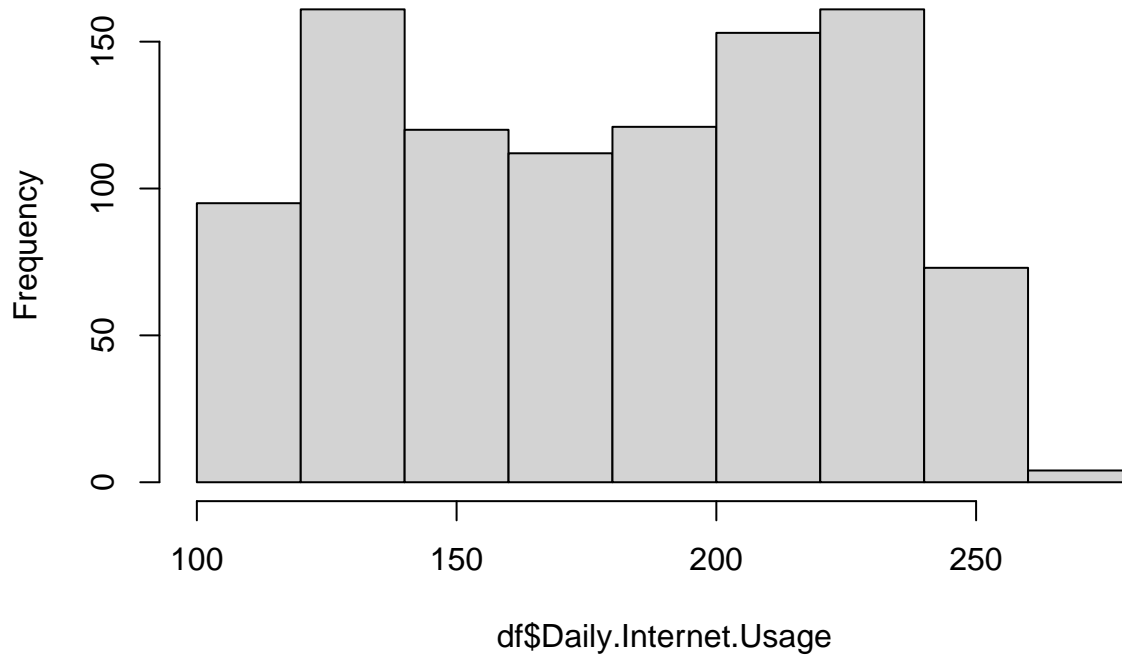
```
# Histogram showing the income
hist(df$Area.Income)
```

Histogram of df\$Area.Income



```
# Histogram showing the daily internet usage  
hist(df$Daily.Internet.Usage)
```

Histogram of df\$Daily.Internet.Usage



```
# Frequency table for internet usage column
table(df$Daily.Internet.Usage)
```

```
##
## 104.78    105 105.04 105.15 105.22 105.63 105.69 105.71 105.86 105.94 106.04
##      1      1      1      1      1      1      1      1      1      1      1
## 106.86 106.96 107.19 107.56 107.92 108.03 108.1 108.15 108.16 108.17 108.18
##      1      1      1      1      1      1      1      1      1      1      1
## 108.25 108.27 108.7 108.85    109 109.04 109.07 109.22 109.29 109.34 109.77
##      1      1      1      1      1      1      1      1      1      1      1
## 109.98 110.25 110.57 110.66 110.68 110.84 110.93 111.02 111.59 111.63 111.71
##      1      1      1      1      1      1      1      1      1      1      1
## 111.8 111.94 112.19 112.52 112.72 113.12 113.53 113.69 113.7 113.75 113.8
##      1      1      1      1      1      1      2      1      1      1      1
## 114.53 114.69 114.85 115.26 115.35 115.37 115.6 115.79 115.91 116.07 116.19
##      1      1      1      1      1      1      1      1      2      1      1
## 116.27 116.38 116.53 117.3 117.33 117.35 117.66 117.75 118.1 118.16 118.27
##      1      1      1      2      1      1      1      1      1      1      1
## 118.39 118.45 118.6 118.69 119.03 119.2 119.27 119.3 119.32 119.47 119.65
##      1      1      1      1      1      1      1      2      1      1      1
## 119.84 119.86 119.93 120.06 120.12 120.25 120.37 120.46 120.49 120.63 120.75
##      1      1      1      2      1      1      1      1      1      1      1
## 120.85 120.9 120.95 121.05 121.07 121.24 121.28 121.57 121.81 122.02 122.04
##      1      1      1      1      1      1      1      1      1      1      1
## 122.31 122.45 122.59 123.08 123.13 123.22 123.24 123.25 123.28 123.51 123.62
##      1      1      1      1      1      1      1      1      1      1      1
```

| | | | | | | | | | | | |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| ## | 123.64 | 123.71 | 123.72 | 123.8 | 123.86 | 123.91 | 124.32 | 124.34 | 124.38 | 124.44 | 124.54 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 124.58 | 124.61 | 124.67 | 124.85 | 125.11 | 125.12 | 125.2 | 125.22 | 125.27 | 125.45 | 125.46 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| ## | 125.65 | 125.85 | 125.94 | 126.11 | 126.29 | 126.39 | 126.44 | 126.95 | 126.97 | 127.01 | 127.07 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 127.11 | 127.2 | 127.26 | 127.37 | 127.56 | 127.65 | 127.82 | 127.83 | 128 | 128.16 | 128.17 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 128.37 | 128.48 | 128.62 | 128.95 | 128.98 | 129.01 | 129.16 | 129.23 | 129.25 | 129.31 | 129.33 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 129.41 | 129.8 | 129.88 | 130.4 | 130.41 | 130.83 | 130.84 | 130.86 | 131.29 | 131.55 | 131.68 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 131.72 | 131.76 | 131.98 | 132.07 | 132.08 | 132.27 | 132.31 | 132.38 | 132.55 | 132.63 | 132.66 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| ## | 132.71 | 133.17 | 133.18 | 133.2 | 133.42 | 133.81 | 133.9 | 133.99 | 134.14 | 134.42 | 134.46 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 134.6 | 134.88 | 135.08 | 135.18 | 135.24 | 135.25 | 135.31 | 135.48 | 135.51 | 135.67 | 135.72 |
| ## | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 136.18 | 136.21 | 136.4 | 136.59 | 136.64 | 136.85 | 136.94 | 136.99 | 137.2 | 137.24 | 137.28 |
| ## | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 137.43 | 137.63 | 137.97 | 138.35 | 138.46 | 138.52 | 138.55 | 138.68 | 138.71 | 138.87 | 139.01 |
| ## | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 139.02 | 139.32 | 139.34 | 139.42 | 140.15 | 140.39 | 140.46 | 140.64 | 140.67 | 140.77 | 140.83 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 140.95 | 141.13 | 141.22 | 141.34 | 141.36 | 141.52 | 141.58 | 141.89 | 141.96 | 142.04 | 142.21 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 142.23 | 142.67 | 142.81 | 143.04 | 143.13 | 143.42 | 143.56 | 143.79 | 143.94 | 144.27 | 144.53 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 144.62 | 144.69 | 144.71 | 144.77 | 145.08 | 145.48 | 145.73 | 145.85 | 145.96 | 145.98 | 146.13 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 146.19 | 146.44 | 146.8 | 147.61 | 147.64 | 147.75 | 147.92 | 148.19 | 148.61 | 148.93 | 149.2 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 149.21 | 149.25 | 149.53 | 149.67 | 149.79 | 149.8 | 150.29 | 150.61 | 150.77 | 150.79 | 150.8 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 150.83 | 150.84 | 150.99 | 151.12 | 151.18 | 151.25 | 151.47 | 151.54 | 151.63 | 151.72 | 151.93 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 151.94 | 151.95 | 151.96 | 152.24 | 152.36 | 152.49 | 152.86 | 152.94 | 153.01 | 153.12 | 153.17 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 153.69 | 153.76 | 153.98 | 154 | 154.02 | 154.23 | 154.74 | 154.75 | 154.77 | 154.93 | 154.97 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 155.8 | 156.11 | 156.3 | 156.36 | 156.48 | 156.54 | 156.97 | 156.99 | 157.04 | 158.03 | 158.05 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 158.22 | 158.29 | 158.35 | 158.42 | 158.56 | 158.8 | 158.81 | 159.05 | 159.24 | 159.46 | 159.6 |
| ## | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 159.69 | 159.77 | 160.03 | 160.33 | 160.49 | 160.73 | 160.74 | 161.16 | 161.24 | 161.29 | 161.42 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| ## | 161.58 | 161.77 | 161.79 | 162.03 | 162.05 | 162.08 | 162.43 | 162.44 | 162.46 | 162.95 | 163 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| ## | 163.05 | 163.38 | 163.48 | 163.99 | 164.02 | 164.25 | 164.63 | 164.83 | 165.27 | 165.43 | 165.52 |
| ## | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| ## | 165.56 | 165.62 | 165.65 | 166.19 | 166.29 | 166.31 | 166.85 | 166.86 | 167.07 | 167.22 | 167.26 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 |
| ## | 167.41 | 167.42 | 167.67 | 167.86 | 167.87 | 168 | 168.15 | 168.27 | 168.29 | 168.34 | 168.41 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

| | | | | | | | | | | | |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| ## | 168.92 | 169.1 | 169.18 | 169.23 | 169.4 | 169.5 | 169.88 | 170.04 | 170.13 | 170.49 | 170.9 |
| ## | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 171.07 | 171.23 | 171.24 | 171.31 | 171.54 | 171.62 | 171.72 | 171.9 | 172.1 | 172.57 | 172.58 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 172.81 | 172.83 | 173.01 | 173.05 | 173.43 | 173.49 | 173.75 | 174.55 | 174.88 | 175.14 | 175.17 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 175.37 | 175.43 | 176.28 | 176.52 | 176.7 | 176.73 | 176.78 | 176.98 | 177.46 | 177.55 | 177.78 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 178.35 | 178.51 | 178.69 | 178.75 | 178.85 | 178.92 | 179.04 | 179.58 | 179.82 | 180.42 | 180.47 |
| ## | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 180.77 | 180.88 | 181.02 | 181.11 | 181.25 | 182.11 | 182.2 | 182.65 | 182.84 | 183.42 | 183.43 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| ## | 183.48 | 183.82 | 183.85 | 184.03 | 184.1 | 184.23 | 184.88 | 184.94 | 184.98 | 185.45 | 185.46 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 185.47 | 185.85 | 186.37 | 186.48 | 186.98 | 187.03 | 187.09 | 187.36 | 187.53 | 187.64 | 187.76 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 187.95 | 188.27 | 188.32 | 188.56 | 189.91 | 190.05 | 190.08 | 190.12 | 190.17 | 190.25 | 190.41 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 190.71 | 190.75 | 190.84 | 190.95 | 191.14 | 191.17 | 191.26 | 191.78 | 191.82 | 192.27 | 192.5 |
| ## | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 192.57 | 192.6 | 192.81 | 192.85 | 192.93 | 193.15 | 193.29 | 193.58 | 193.6 | 193.63 | 193.77 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 193.8 | 193.97 | 194.23 | 194.37 | 194.44 | 194.56 | 194.62 | 194.83 | 194.95 | 195.07 | 195.31 |
| ## | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 195.36 | 195.54 | 195.56 | 195.68 | 195.69 | 195.89 | 195.91 | 195.93 | 196.17 | 196.23 | 196.61 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 196.71 | 196.76 | 196.77 | 196.83 | 197.15 | 197.33 | 197.66 | 197.93 | 198.11 | 198.13 | 198.24 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 198.3 | 198.32 | 198.45 | 198.5 | 198.56 | 198.72 | 198.79 | 198.86 | 199.08 | 199.25 | 199.29 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 199.39 | 199.4 | 199.43 | 199.62 | 199.76 | 199.79 | 200.22 | 200.23 | 200.28 | 200.55 | 200.58 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 200.59 | 200.71 | 201.04 | 201.15 | 201.24 | 201.26 | 201.29 | 201.54 | 201.58 | 202.12 | 202.16 |
| ## | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 202.18 | 202.25 | 202.34 | 202.61 | 202.7 | 202.77 | 202.9 | 203.23 | 203.3 | 203.44 | 203.74 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 203.84 | 203.87 | 203.9 | 204.02 | 204.22 | 204.27 | 204.4 | 204.47 | 204.52 | 204.56 | 204.79 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 204.82 | 204.86 | 205.38 | 205.5 | 205.64 | 205.71 | 205.84 | 206.79 | 206.98 | 207.17 | 207.18 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 207.27 | 207.44 | 207.48 | 207.53 | 207.87 | 207.96 | 208.01 | 208.02 | 208.05 | 208.21 | 208.23 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 208.24 | 208.36 | 208.58 | 208.76 | 209.25 | 209.64 | 209.72 | 209.82 | 209.91 | 209.93 | 210.23 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 210.26 | 210.27 | 210.39 | 210.46 | 210.53 | 210.54 | 210.6 | 210.87 | 211.12 | 211.17 | 211.38 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 211.39 | 211.56 | 211.64 | 211.65 | 211.83 | 211.87 | 212.3 | 212.38 | 212.56 | 212.58 | 212.59 |
| ## | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 |
| ## | 212.67 | 212.79 | 212.87 | 212.88 | 212.92 | 213.36 | 213.38 | 213.7 | 213.75 | 213.96 | 214.06 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ## | 214.08 | 214.23 | 214.33 | 214.38 | 214.42 | 214.49 | 214.53 | 214.74 | 215.04 | 215.18 | 215.25 |
| ## | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 |
| ## | 215.29 | 215.44 | 215.93 | 216 | 216.01 | 216.03 | 216.24 | 216.49 | 216.5 | 216.57 | 216.87 |
| ## | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

```
## 217.1 217.37 217.66 217.68 217.79 217.85 218.17 218.22 218.49 218.61 218.79
##      1      1      1      1      1      1      1      1      1      1      1
## 218.8 218.97 219.49 219.55 219.69 219.72 219.75 219.79 219.91 219.94 219.98
##      1      1      1      1      1      2      1      1      1      1      1
## 220.05 220.08 220.48 220.92 221.18 221.21 221.51 221.53 221.59 221.79 221.94
##      1      1      1      1      1      1      1      1      1      1      1
## 221.98 222.08 222.11 222.25 222.26 222.35 222.63 222.72 222.75 222.77 222.87
##      1      1      2      1      1      1      1      1      1      1      1
## 222.91 223.03 223.09 223.16 223.2 223.28 223.93 224.01 224.07 224.2 224.23
##      1      1      1      2      1      1      1      1      1      1      1
## 224.44 224.58 224.82 224.9 224.92 224.98 225 225.02 225.05 225.23 225.24
##      1      1      1      1      1      1      1      1      1      1      1
## 225.29 225.34 225.47 225.58 225.76 225.87 225.97 225.99 226.11 226.45 226.49
##      1      1      1      1      1      1      1      1      1      1      1
## 226.54 226.64 226.69 226.74 226.79 227.37 227.53 227.56 227.63 227.72 227.73
##      1      1      1      1      1      1      1      1      1      1      1
## 228.03 228.7 228.76 228.78 228.81 228.94 229.12 229.19 229.22 229.88 229.99
##      1      1      1      1      2      1      1      1      1      1      1
## 230.14 230.18 230.36 230.52 230.77 230.78 230.87 230.9 230.91 230.93 230.95
##      1      1      2      1      1      1      1      1      1      1      1
## 231.07 231.21 231.28 231.37 231.38 231.42 231.48 231.49 231.54 231.59 231.85
##      1      1      1      1      1      1      1      1      1      1      1
## 231.87 231.91 231.94 231.95 232.21 232.54 232.68 232.78 233.04 233.36 233.56
##      1      1      1      1      1      1      1      1      1      1      1
## 233.6 233.61 233.65 233.85 233.93 234.23 234.26 234.64 234.72 234.75 234.81
##      1      1      1      1      1      1      1      1      1      2      1
## 235.01 235.28 235.29 235.35 235.56 235.78 235.94 235.97 235.99 236.08 236.15
##      1      2      1      1      1      1      1      1      1      1      1
## 236.19 236.29 236.5 236.64 236.72 236.75 236.87 236.96 237.34 237.39 238.06
##      1      1      1      1      1      1      1      2      1      1      1
## 238.1 238.43 238.45 238.58 238.63 238.99 239.22 239.32 239.52 239.76 239.94
##      1      1      1      1      1      1      1      1      1      1      1
## 240.09 240.63 240.64 240.95 241.03 241.36 241.38 241.5 241.8 242.37 242.59
##      1      1      1      1      1      1      1      1      1      1      1
## 243.37 243.61 244.23 244.34 244.4 244.55 244.87 244.91 245.5 245.76 245.78
##      1      1      1      1      1      1      1      1      1      1      1
## 245.89 246.06 246.29 246.44 246.72 247.01 247.05 247.31 247.9 248.12 248.16
##      1      1      1      1      1      1      2      1      1      1      1
## 248.19 248.23 248.51 249.45 249.54 249.81 249.99 250 250.03 250.11 250.2
##      1      1      1      1      1      1      1      1      1      1      1
## 250.32 250.35 250.36 251 251.08 252.07 252.36 252.6 252.77 253.17 253.48
##      1      1      1      1      1      1      1      1      1      1      1
## 254.05 254.34 254.57 254.59 254.65 254.94 255.07 255.57 255.61 256.09 256.39
##      1      1      1      1      1      1      1      1      1      1      1
## 256.4 258.06 258.26 258.62 259.76 261.02 261.52 267.01 269.96
##      2      1      1      1      1      1      1      1      1
```

```
## Bivariate analysis
# Getting the covariance
cov(numeric)
```

```
##           Daily.Time.Spent.on.Site           Age      Area.Income
## Daily.Time.Spent.on.Site      251.3370949 -4.617415e+01  6.613081e+04
## Age          -46.1741459   7.718611e+01 -2.152093e+04
```

```
## Area.Income          66130.8109082 -2.152093e+04  1.799524e+08
## Daily.Internet.Usage  360.9918827 -1.416348e+02  1.987625e+05
## Male                 -0.1501864 -9.242142e-02  8.867509e+00
## Clicked.on.Ad        -5.9331431  2.164665e+00 -3.195989e+03
##                      Daily.Internet.Usage      Male Clicked.on.Ad
## Daily.Time.Spent.on.Site  3.609919e+02 -0.15018639 -5.933143e+00
## Age                     -1.416348e+02 -0.09242142  2.164665e+00
## Area.Income             1.987625e+05  8.86750903 -3.195989e+03
## Daily.Internet.Usage    1.927415e+03  0.61476667 -1.727409e+01
## Male                   6.147667e-01  0.24988889 -9.509510e-03
## Clicked.on.Ad          -1.727409e+01 -0.00950951  2.502503e-01
```

```
# Getting the correlation coefficient
```

```
matrix = cor(numeric)
matrix
```

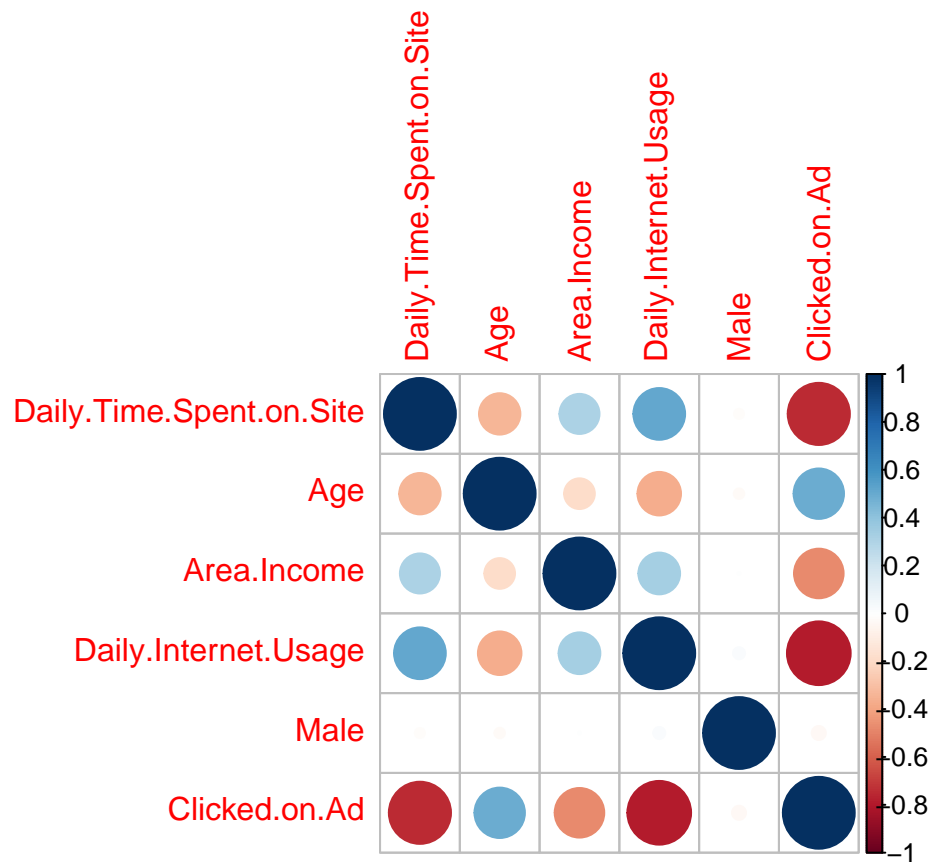
```
##                      Daily.Time.Spent.on.Site      Age Area.Income
## Daily.Time.Spent.on.Site  1.00000000 -0.33151334  0.310954413
## Age                     -0.33151334  1.00000000 -0.182604955
## Area.Income             0.31095441 -0.18260496  1.000000000
## Daily.Internet.Usage    0.51865848 -0.36720856  0.337495533
## Male                   -0.01895085 -0.02104406  0.001322359
## Clicked.on.Ad          -0.74811656  0.49253127 -0.476254628
##                      Daily.Internet.Usage      Male Clicked.on.Ad
## Daily.Time.Spent.on.Site  0.51865848 -0.018950855 -0.74811656
## Age                     -0.36720856 -0.021044064  0.49253127
## Area.Income             0.33749553  0.001322359 -0.47625463
## Daily.Internet.Usage    1.00000000  0.028012326 -0.78653918
## Male                   0.02801233  1.000000000 -0.03802747
## Clicked.on.Ad          -0.78653918 -0.038027466  1.00000000
```

```
# getting the correlation matrix
```

```
library(corrplot)
```

```
## corrplot 0.92 loaded
```

```
corrplot(matrix)
```

From the plot, I recommend that the enterprenuer maximizes on the different ages since there is a positive correlation with age and clicked ads The enterprenuer should also maximize in areas of high income since there is a positive correlation between the income and internet usage