cryptography adverts

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2/28/2020

1.1 Defining the Question

Identifing which individuals are most likely to click on her ads.

1.2 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. In the past, she ran ads to advertise a related course on the same blog and collected data in the process. 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.

1.3 Metrics for Success

Analysisng the data to get the target audience.

1.1.4 Experimental Design Taken

Loading the data Reading the data Data Cleaning Exploratory Data Analysis Conclusion

1.1.5 Appropriateness of the Data

Dataset link: link text The columns in the dataset are: Daily Time Spent on Site Age Area Income Daily Internet Usage Ad Topic Line City Male Country Timestamp Clicked on Ad

```
# Checking for the summary description of our data

summary(ads)
```

```
##  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
##
##                                  Ad.Topic.Line              City
##  Adaptive 24hour Graphic Interface      :  1   Lisamouth      :  3
##  Adaptive asynchronous attitude         :  1   Williamsport   :  3
##  Adaptive context-sensitive application :  1   Benjaminchester:  2
##  Adaptive contextually-based methodology:  1   East John      :  2
##  Adaptive demand-driven knowledgebase   :  1   East Timothy   :  2
##  Adaptive uniform capability            :  1   Johnstad       :  2
##  (Other)                                :994   (Other)        :986
##       Male                 Country                  Timestamp   Clicked.on.Ad
```

```
##  Min.   :0.000   Czech Republic:  9   2016-01-01 02:52:10:  1   Min.   :0.0
##  1st Qu.:0.000   France        :  9   2016-01-01 03:35:35:  1   1st Qu.:0.0
##  Median :0.000   Afghanistan   :  8   2016-01-01 05:31:22:  1   Median :0.5
##  Mean   :0.481   Australia     :  8   2016-01-01 08:27:06:  1   Mean   :0.5
##  3rd Qu.:1.000   Cyprus        :  8   2016-01-01 15:14:24:  1   3rd Qu.:1.0
##  Max.   :1.000   Greece        :  8   2016-01-01 20:17:49:  1   Max.   :1.0
##                  (Other)       :950   (Other)            :994
```

```
# Checking the structure of our dataset

str(ads)
```

```
## '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           : Factor w/ 1000 levels "Adaptive 24hour Graphic Interface",..: 92 465 56
##  $ City                    : Factor w/ 969 levels "Adamsbury","Adamside",..: 962 904 112 940 806 283
##  $ Male                    : int  0 1 0 1 0 1 0 1 1 1 ...
##  $ Country                 : Factor w/ 237 levels "Afghanistan",..: 216 148 185 104 97 159 146 13 83
##  $ Timestamp               : Factor w/ 1000 levels "2016-01-01 02:52:10",..: 440 475 368 57 768 690
##  $ Clicked.on.Ad           : int  0 0 0 0 0 0 0 1 0 0 ...
```

We have 1000 rows by 10 columns and most the datatypes have been given as numeric and factors.

```
## Cleaning our data

# Checking for missing values
# identifying missing data

is.na(ads)
```

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##       Daily.Time.Spent.on.Site   Age Area.Income Daily.Internet.Usage
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##  [884,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [885,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [886,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [887,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [888,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [889,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [890,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [891,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [892,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [893,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [894,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [895,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [896,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [897,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [898,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [899,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [900,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [904,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [905,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [906,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [907,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [908,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
```

```
##  [909,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [910,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [911,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [912,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [913,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [914,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [915,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [916,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [917,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [918,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [919,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [920,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [921,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [922,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [923,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [924,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [925,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [926,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [927,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [928,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [929,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [930,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [931,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [932,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [936,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [937,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [938,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [939,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [942,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [946,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [947,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [948,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [949,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [962,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
```

```
##  [963,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [966,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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##  [976,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [977,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [978,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [979,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [980,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [981,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [982,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [983,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [984,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [985,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [986,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [987,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [988,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
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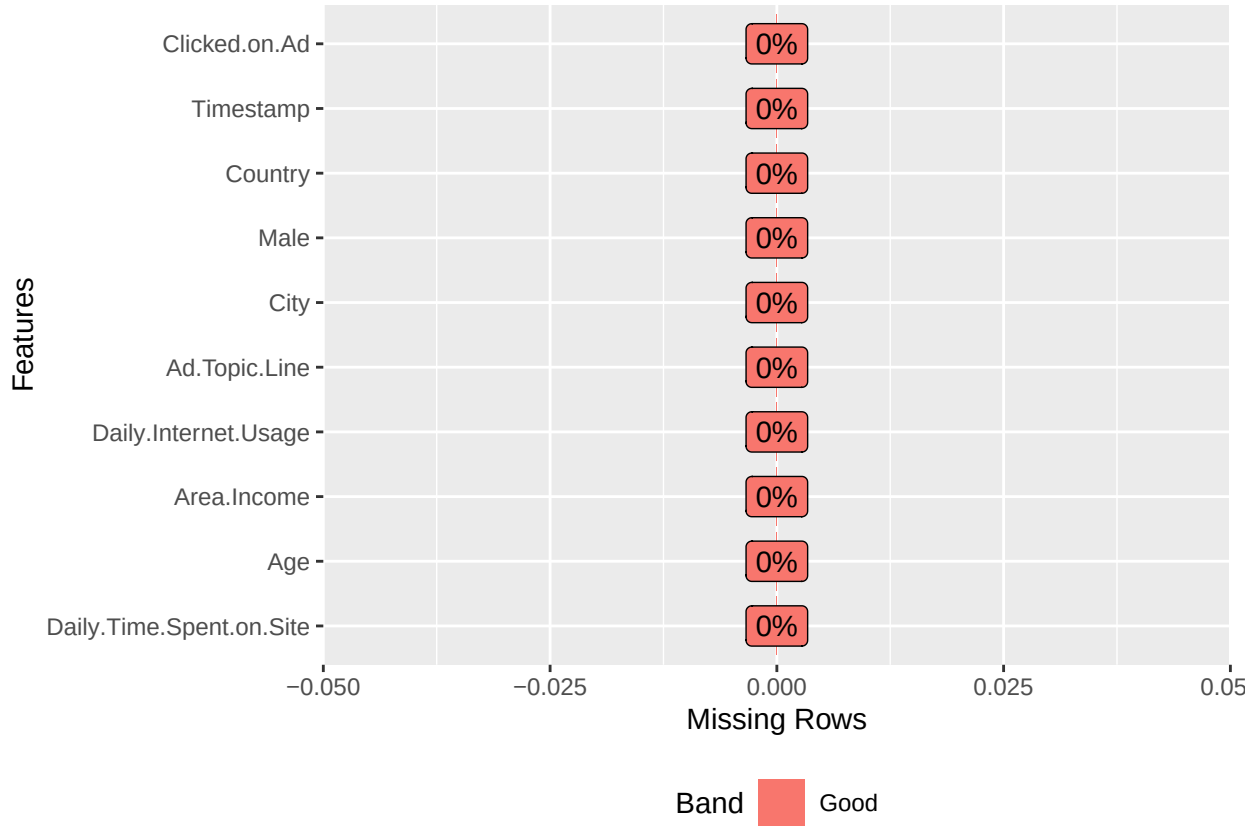
##  [992,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [993,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [994,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [995,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [996,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [997,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [998,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
##  [999,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
## [1000,]         FALSE FALSE FALSE   FALSE     FALSE         FALSE
```

```r
# checking for total missing values

colSums(is.na(ads))
```

```
## 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
```

```
# visuals for missing data

library(DataExplorer)
plot_missing(ads)
```



We can see that we dont have missing values in our data. So there will be no need for cleaning on missing values

```
# Checking for duplicated data

duplicated_ads <- ads[duplicated(ads),]

duplicated_ads
```

```
##  [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)
```

```
anyDuplicated(ads)
```

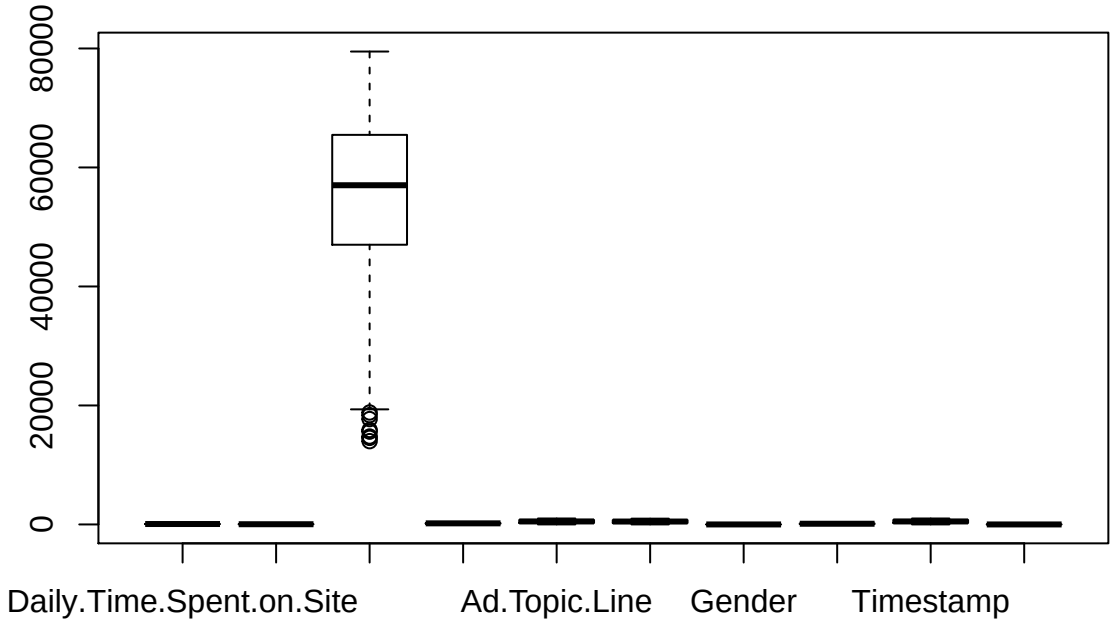
```
## [1] 0
```

There are no duplicated values in our dataest

```
# changing the column name male to gender

colnames(ads)[colnames(ads) == 'Male'] = 'Gender'
```

```
levels(ads$Gender) = c('Female' , 'Male')
```

```
## Checking for outliers

# Plot a boxplot to help us visualise any existing outliers

boxplot(ads)
```



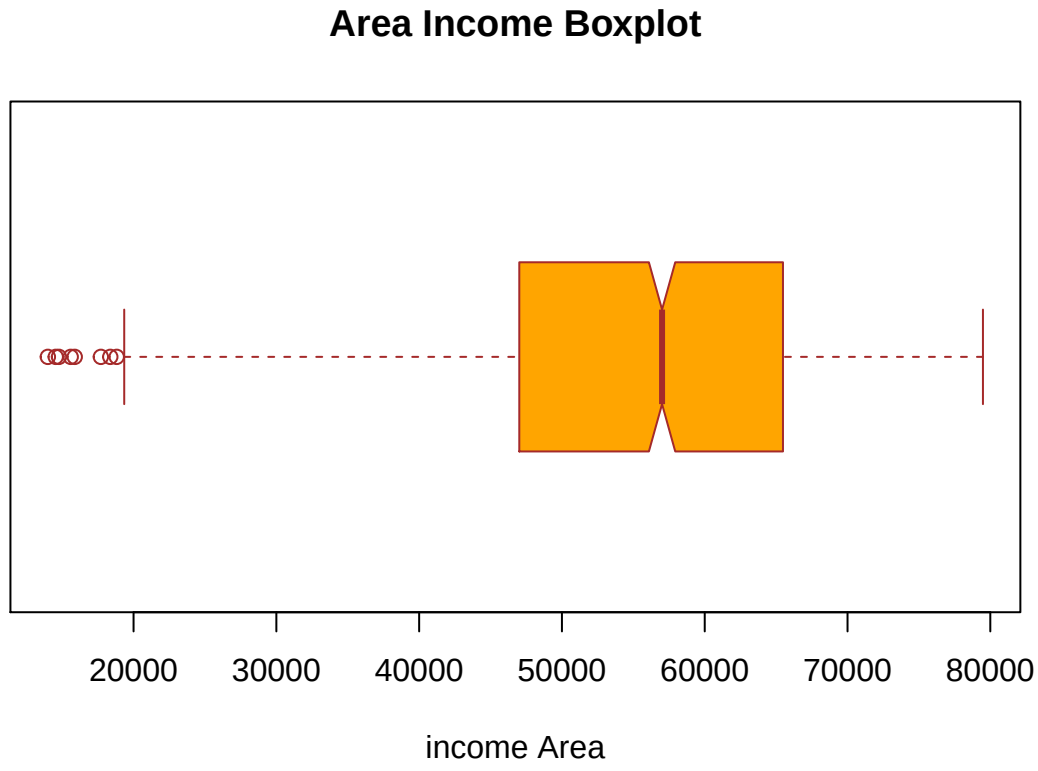
We can note that there are outliers in the column area income. Lets go ahead and list the outliers below.

```
# listing the outliers in the vectors

boxplot.stats(ads$Area.Income)$out
```

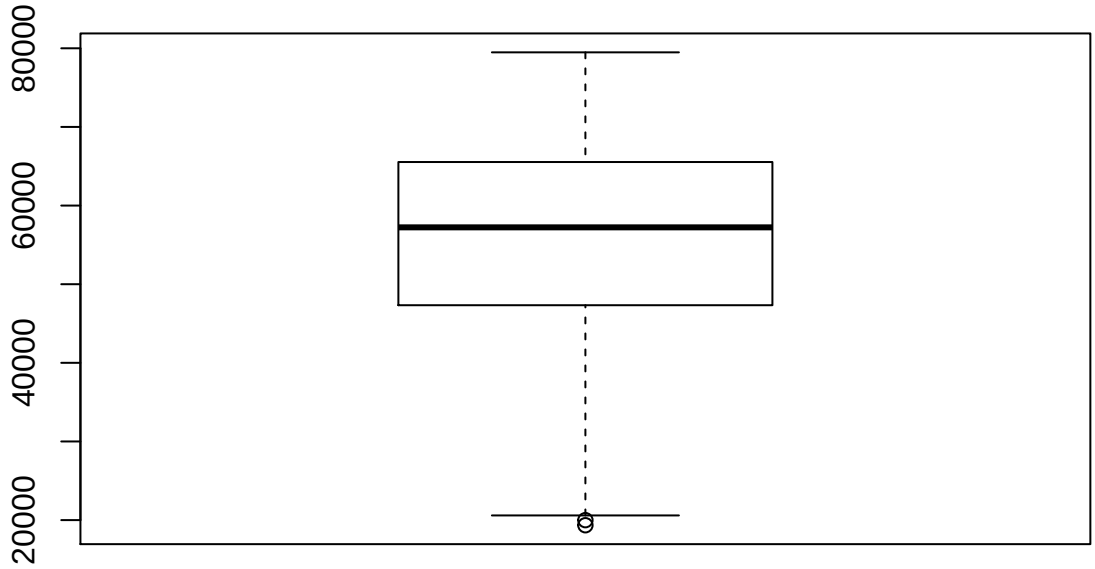
```
## [1] 17709.98 18819.34 15598.29 15879.10 14548.06 13996.50 14775.50 18368.57
```

```
# plotting a boxplot for the area income outliers

boxplot(ads$Area.Income,
main = "Area Income Boxplot",
xlab = "income Area",
```

```
col = "orange",
border = "brown",
horizontal = TRUE,
notch = TRUE
)
```




```
# Handling the outliers in the area income variable.
# we store the outliers in a variable outliers.

outliers = boxplot.stats(ads$Area.Income)$out

# This vector is to be excluded from our dataset
# The which() function tells us the rows in which the outliers exist,
# These rows will be removed from our data set.
# The dataset advertising will be stored in a new variable so as not to destroy dataset

new_ads = ads
new_ads = new_ads[-which(new_ads$Area.Income %in% outliers),]

# Checking if the new data frame has outliers.
#
boxplot(new_ads $ Area.Income)
```



The outliers have been deleted.

EDA

univariate Analysis

Measures of central tendency

getting the mean

```
# getting the mean for the numerical columns

# Daily.Time.Spent
ads.mean <- mean(new_ads$Daily.Time.Spent.on.Site)
ads.mean
```

```
## [1] 65.03979
```

```
## the daily time spent mean is 65.03979

# Age
ads.mean <- mean(new_ads$Age)
ads.mean
```

```
## [1] 35.98286
```

```
## the age mean is 35.98286

# Areas.Income
ads.mean <- mean(new_ads$Area.Income)
ads.mean
```

```
## [1] 55312.81
```

```
## the areas income mean is 55312.81

# Daily.Internet
ads.mean <- mean(new_ads$Daily.Internet.Usage)
ads.mean
```

```
## [1] 179.985
```

```
## the daily internet mean is 179.985
```

```
# getting the median for the numerical columns

# Daily.Time.Spent
ads.median <- median(new_ads$Daily.Time.Spent.on.Site)
ads.median
```

```
## [1] 68.39
```

```
## the daily time spent median is 68.39

# Age
ads.median <- median(new_ads$Age)
ads.median
```

```
## [1] 35
```

```
## the age median is 35

# Areas.Income
ads.median <- median(new_ads$Area.Income)
ads.median
```

```
## [1] 57228.18
```

```
## the areas income median is 57228.18

# Daily.Internet
ads.median <- median(new_ads$Daily.Internet.Usage)
ads.median
```

```
## [1] 183.425
```

```
## the daily internet median is 183.425
```

```
# creating a function that perform the mode operation

getmode <- function(v) {
   uniqv <- unique(v)
   uniqv[which.max(tabulate(match(v, uniqv)))]
}

# getting the median for the numerical columns

# Daily.Time.Spent
ads.mode <- getmode(new_ads$Daily.Time.Spent.on.Site)
ads.mode
```

```
## [1] 62.26
```

```
## the daily time spent mode is 62.26

# Age
ads.mode <- getmode(new_ads$Age)
ads.mode
```

```
## [1] 31
```

```
## the age mode is 31

# Areas.Income
ads.mode <- getmode(new_ads$Area.Income)
ads.mode
```

```
## [1] 61833.9
```

```
## the areas income mode is 61833.9

# Daily.Internet
ads.mode <- getmode(new_ads$Daily.Internet.Usage)
ads.mode
```

```
## [1] 167.22
```

```
## the daily internet mode is 167.22
```

```
# getting the range for the numerical columns

# Daily.Time.Spent
ads.range <- range(new_ads$Daily.Time.Spent.on.Site)
ads.range
```

```
## [1] 32.60 91.43
```

```
## the daily time spent ranges between 32.60 and 91.43

# Age
ads.range <- range(new_ads$Age)
ads.range
```

```
## [1] 19 61
```

```
## the age ranges between 19 and 61

# Areas.Income
ads.range <- range(new_ads$Area.Income)
ads.range
```

```
## [1] 19345.36 79484.80
```

```
## the areas income ranges between 19345.36 and 79484.80

# Daily.Internet
ads.range <- range(new_ads$Daily.Internet.Usage)
ads.range
```

```
## [1] 104.78 269.96
```

```
## the daily internet ranges between 104.78 and 269.96
```

```
# getting the quantile ranges for the numerical columns

# Daily.Time.Spent
ads.quantile <- quantile(new_ads$Daily.Time.Spent.on.Site)
ads.quantile
```

```
##     0%    25%    50%    75%   100%
## 32.600 51.285 68.390 78.585 91.430
```

```
## the min ,25th quantile, 50th quantile, 75th quantile and max values for daily time spent are 32.600,

# Age
ads.quantile <- quantile(new_ads$Age)
ads.quantile
```

```
##   0%  25%  50%  75% 100%
##   19   29   35   42   61
```

```
## ## the min ,25th quantile, 50th quantile, 75th quantile and max values for age are 19, 29, 35,   42,

# Areas.Income
ads.quantile <- quantile(new_ads$Area.Income)
ads.quantile
```

```
##       0%      25%      50%      75%     100%
## 19345.36 47332.82 57228.18 65518.96 79484.80
```

```
## ## the min ,25th quantile, 50th quantile, 75th quantile and max values for areas income are 19345.36

# Daily.Internet
ads.quantile <- quantile(new_ads$Daily.Internet.Usage)
ads.quantile
```

```
##       0%      25%      50%      75%     100%
## 104.7800 138.6475 183.4250 218.8425 269.9600
```

```
## ## the min ,25th quantile, 50th quantile, 75th quantile and max values for daily internet are 104.78
```

The variance is a numerical measure of how the data values is dispersed around the mean.

```
# getting the variance for the numerical columns


# Daily.Time.Spent
ads.var <- var(new_ads$Daily.Time.Spent.on.Site)
ads.var
```

```
## [1] 252.8609
```

```
## the daily time spent variance is 252.8609

# Age
ads.var <- var(new_ads$Age)
ads.var
```

```
## [1] 77.45379
```

```
## the age variance is 77.45379

# Areas.Income
ads.var <- var(new_ads$Area.Income)
ads.var
```

```
## [1] 169137582
```

```
## the areas income variance is 169137582

# Daily.Internet
ads.var <- var(new_ads$Daily.Internet.Usage)
ads.var
```

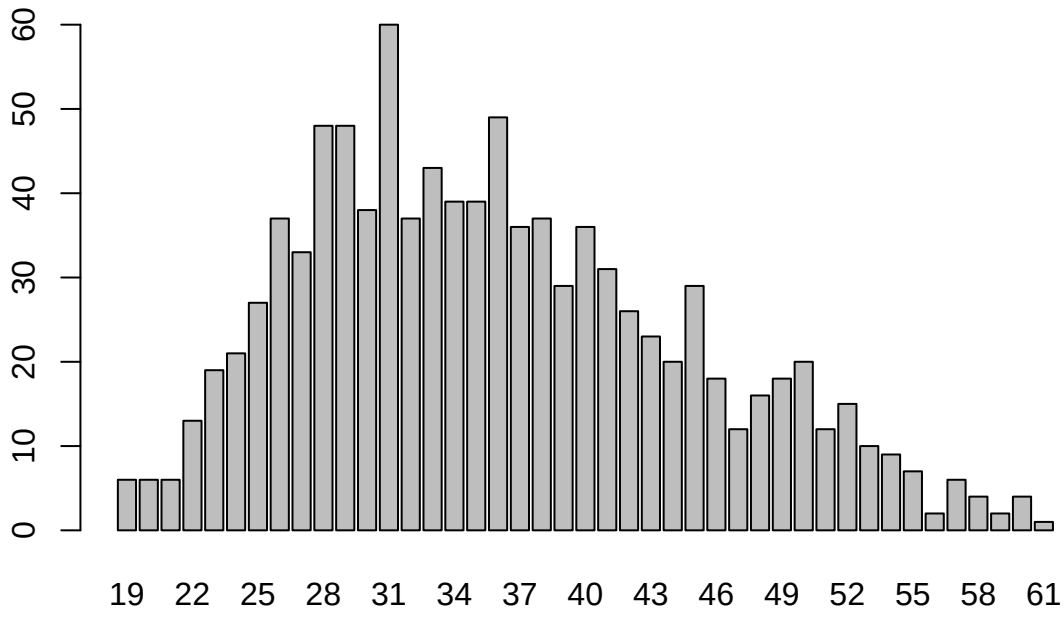
```
## [1] 1938.785
```

```
## the daily internet variance is 1938.785
```

```
# Creating bar graphs

# Fetching the age column

Age <- new_ads$Age

# Applying the table() function will compute the frequency distribution of the Age variable
# ---
#
age_freq <- table(Age)
age_freq
```

```
## 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 38 60 37 43 39 39 49 36 37 29 36 31 26 23 20
## 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61
## 29 18 12 16 18 20 12 15 10  9  7  2  6  4  2  4  1
```

```
# Applying the barplot function to produce its bar graph

barplot(age_freq)
```

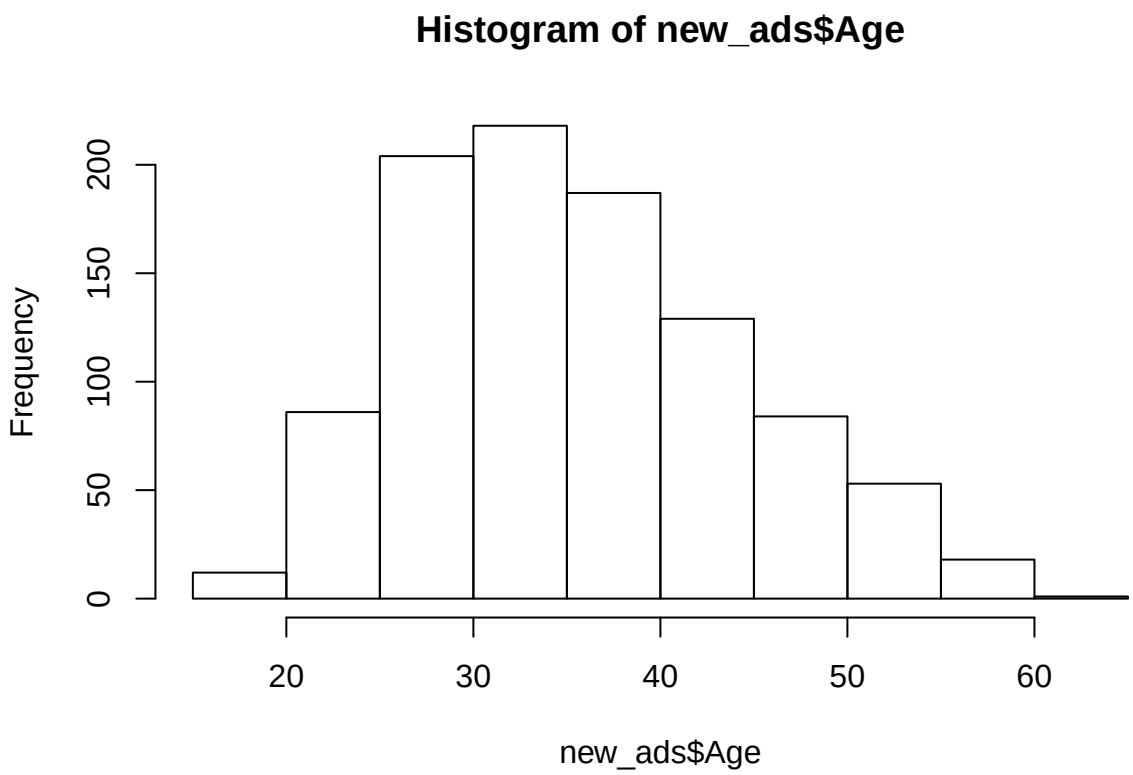


We can see that ages between 27 and 35 had the highest frequency from the bargraph. The ads should mostly be targeted to this age category of individuals.

From this, we can also tell that our data is skewed to the right.

```
# A histogram shows the frequency distribution of a quantitative variable. The area of each bar is equa

# We will go ahead and create a histogram.
```

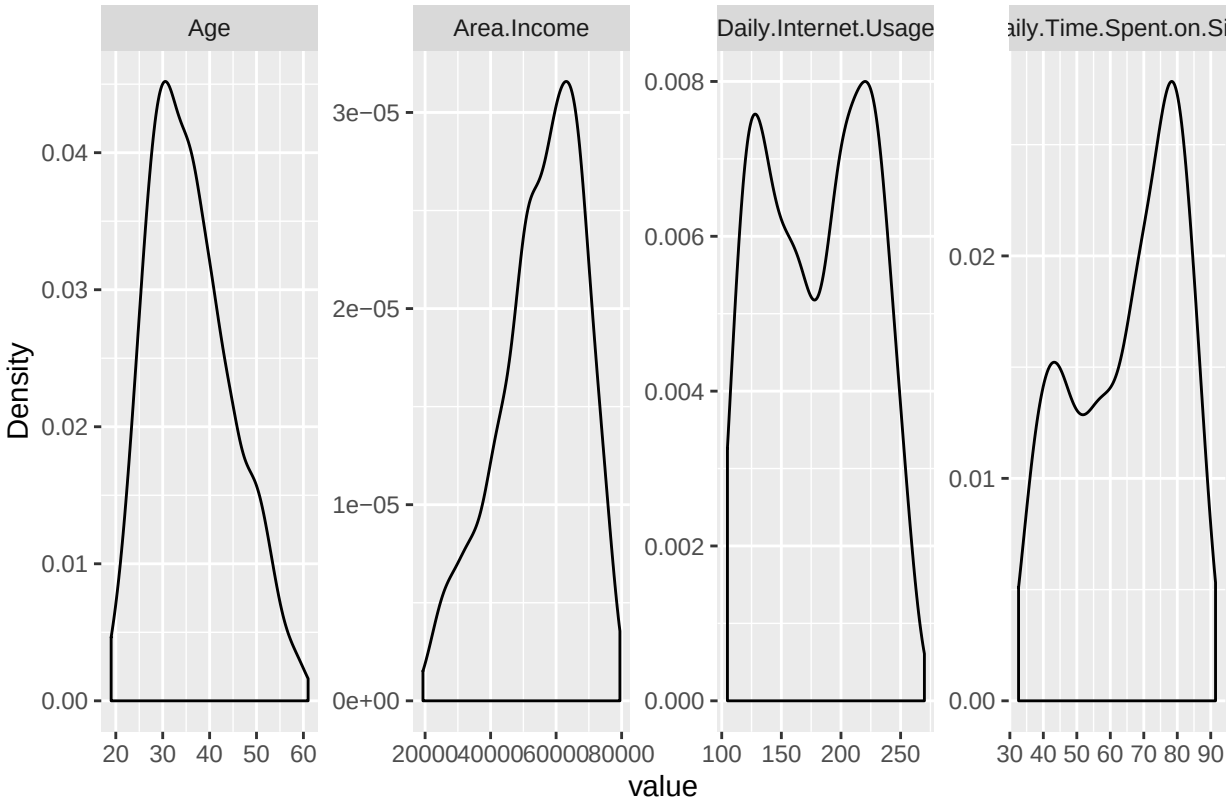
```
# We will apply the hist() function to the age variable

hist(new_ads$Age)
```



We get to see the same frequency distribution. Highest frequency is between ages 25 and 40.

We also note the positive skewness in the histogram.

```
# plotting a density plot for ur numerical values

library(DataExplorer)
plot_density(new_ads)
```



From the density plots, we see that Age has a positive skew meaning more young people click on ads as compared to older people. Income has a negative skew. Most people have high incomes as compared to those with low incomes. Daily internet usgae is more of a binormail distribution. Daily time spent on site is also more of a negative skew. Most poeple spend around 80 minutes on the site.

```
install.packages("ggplot2")
```

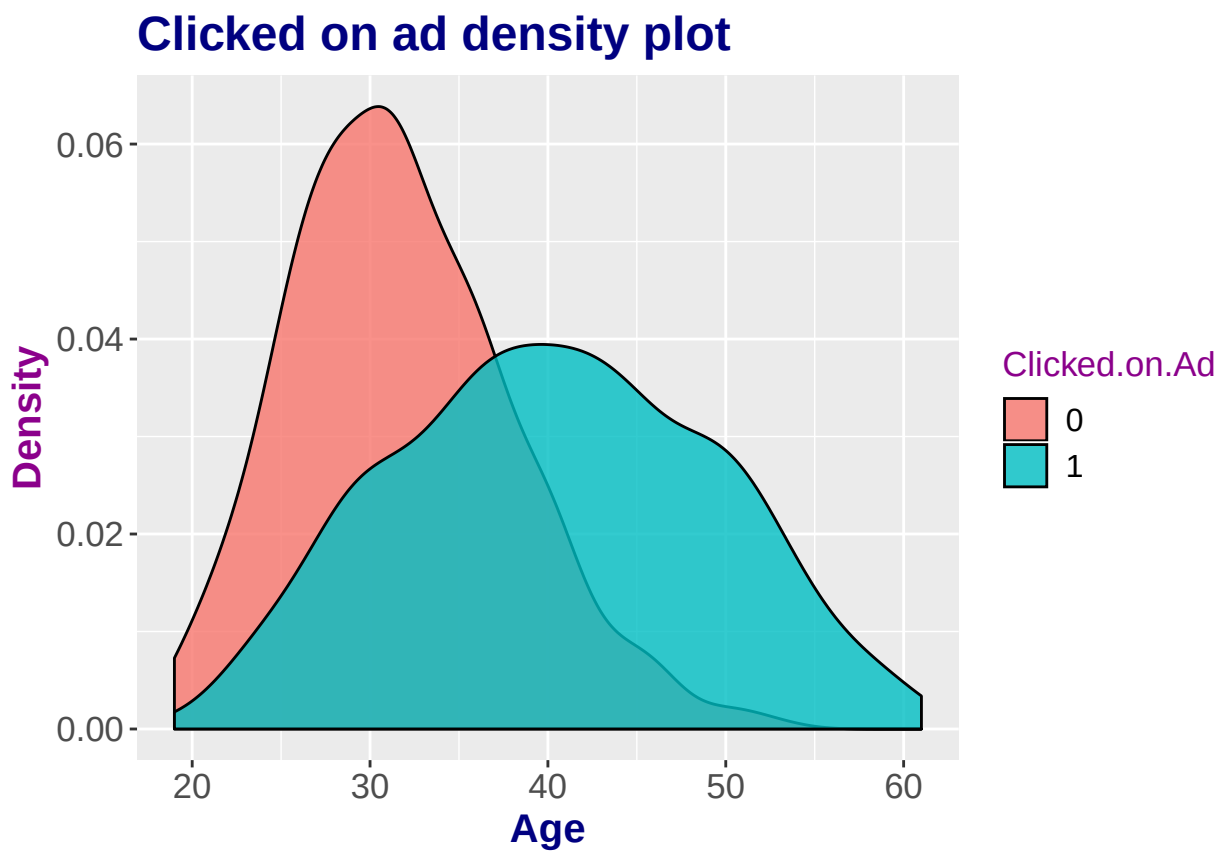
```
## Installing package into '/home/lydia/R/x86_64-pc-linux-gnu-library/3.6'
## (as 'lib' is unspecified)
```

```
library(ggplot2)
```

```
 # Plotting density plot
options(repr.plot.width = 13, repr.plot.height = 7)
p1 = ggplot(data = new_ads, aes(Age)) +
        geom_density(aes(fill=factor(Clicked.on.Ad)), alpha = 0.8) +
        labs(title = 'Clicked on ad density plot', x = 'Age', y = 'Density', fill = 'Clicked.on.Ad') +
        scale_color_brewer(palette = 'bright') +
        theme(plot.title = element_text(size = 18, face = 'bold', color = 'navyblue'),
             axis.title.x = element_text(size = 15, face = 'bold', color = 'navyblue'),
             axis.title.y = element_text(size = 15, face = 'bold', color = 'darkmagenta'),
             axis.text.x = element_text(size = 13, angle = 0),
             axis.text.y = element_text(size = 13),
             legend.title = element_text(size = 13, color = 'darkmagenta'),
             legend.text = element_text(size = 12))
```

```
## Warning in pal_name(palette, type): Unknown palette bright
```

```
plot(p1)
```



Most young people clicked on ads this is shown by the pink density plot. From the blue denity plot, we acn tell that older people do not click on ads as often.

Bivariate Analysis.

Covariance

Covariance is a statistical representation of the degree to which two variables vary together.

```
# We will look at Age vs daily time spent on site

# Assigning the Age column to the variable age
# ---
#
Age <- new_ads$Age

# Assigning the daiy time spent on site column to the variable time
# ---
#
Time <- new_ads$Daily.Time.Spent.on.Site
```

```r
# Using the cov() function to determine the covariance
# ---
#
cov(Age, Time)
```

```
## [1] -46.5009
```

The covariance of Age and daily time spent on site is -46.5009. It indicates a negative linear relationship between the two variables.

```r
# We will look at Age vs income area

# Assigning the Age column to the variable age
# ---
#
Age <- new_ads$Age

# Assigning the income area column to the variable income
# ---
#
Income <- new_ads$Area.Income

# Using the cov() function to determine the covariance
# ---
#
cov(Age, Income)
```

```
## [1] -20614.92
```

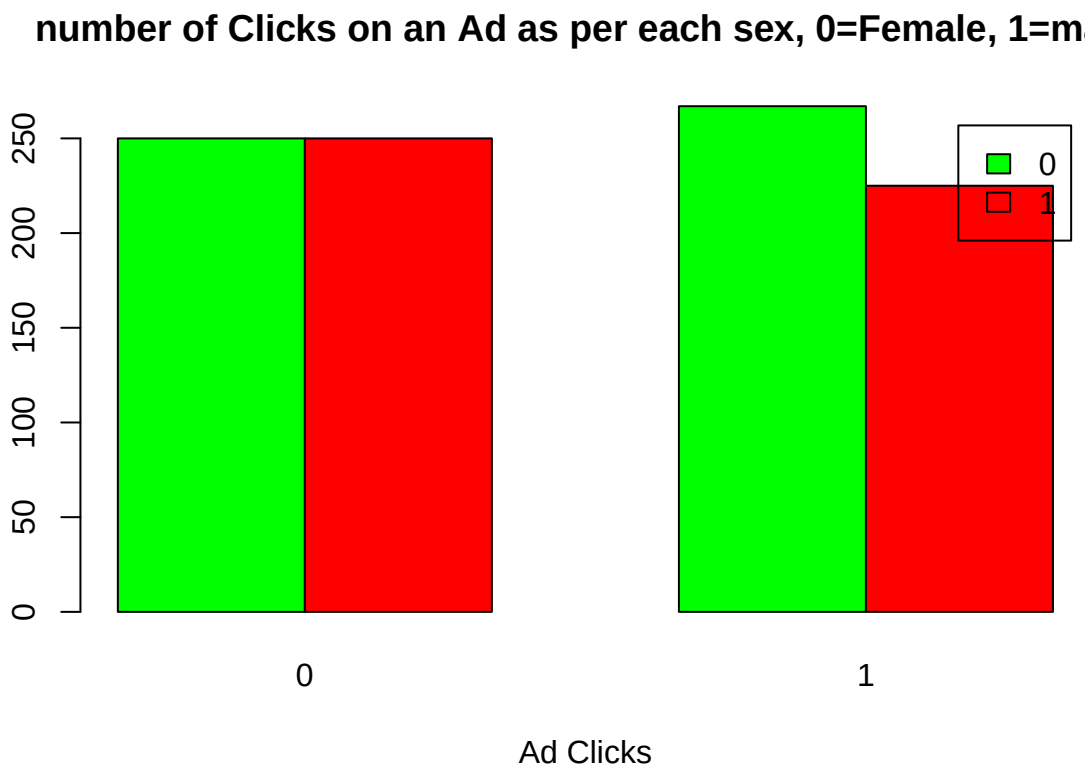
The covariance of Age and income ares is -20614.92. It indicates a negative linear relationship between the two variables.

```r
# We will look at Age vs daily internet

# Assigning the Age column to the variable age
# ---
#
Age <- new_ads$Age

# Assigning the daily internet column to the variable internet
# ---
#
Internet <- new_ads$Daily.Internet.Usage

# Using the cov() function to determine the covariance
# ---
#
cov(Age, Internet)
```

```
## [1] -142.5798
```

The covariance of Age and internet usage is -142.5798. It indicates a negative linear relationship between the two variables.

```
# Grouped Bar Plot
counts = table( new_ads$Gender, new_ads$Clicked.on.Ad)
barplot(counts, main="number of Clicks on an Ad as per each sex, 0=Female, 1=male",
xlab="Ad Clicks", col=c("green","red"),
legend = rownames(counts), beside=TRUE)
```



Females clicked on the ads more than the males.

Correlation Coefficient

The correlation coefficient of two variables in a data set equals to their covariance divided by the product of their individual standard deviations.

```
# getting the correlation matrix for our numerical columns

X = subset(new_ads, select = c("Daily.Time.Spent.on.Site", "Age", "Area.Income", "Daily.Internet.Usage"
X
```

```
##      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
## 7                    88.91  33    53852.85              208.36
## 8                    66.00  48    24593.33              131.76
## 9                    74.53  30    68862.00              221.51
## 10                   69.88  20    55642.32              183.82
## 11                   47.64  49    45632.51              122.02
## 12                   83.07  37    62491.01              230.87
## 13                   69.57  48    51636.92              113.12
## 14                   79.52  24    51739.63              214.23
## 15                   42.95  33    30976.00              143.56
## 16                   63.45  23    52182.23              140.64
## 17                   55.39  37    23936.86              129.41
## 18                   82.03  41    71511.08              187.53
## 19                   54.70  36    31087.54              118.39
## 20                   74.58  40    23821.72              135.51
## 21                   77.22  30    64802.33              224.44
## 22                   84.59  35    60015.57              226.54
## 23                   41.49  52    32635.70              164.83
## 24                   87.29  36    61628.72              209.93
## 25                   41.39  41    68962.32              167.22
## 26                   78.74  28    64828.00              204.79
## 27                   48.53  28    38067.08              134.14
## 28                   51.95  52    58295.82              129.23
## 29                   70.20  34    32708.94              119.20
## 30                   76.02  22    46179.97              209.82
## 31                   67.64  35    51473.28              267.01
## 32                   86.41  28    45593.93              207.48
## 33                   59.05  57    25583.29              169.23
## 34                   55.60  23    30227.98              212.58
## 35                   57.64  57    45580.92              133.81
## 36                   84.37  30    61389.50              201.58
## 37                   62.26  53    56770.79              125.45
## 38                   65.82  39    76435.30              221.94
## 39                   50.43  46    57425.87              119.32
## 40                   38.93  39    27508.41              162.08
## 41                   84.98  29    57691.95              202.61
## 42                   64.24  30    59784.18              252.36
## 43                   82.52  32    66572.39              198.11
## 44                   81.38  31    64929.61              212.30
## 45                   80.47  25    57519.64              204.86
## 46                   37.68  52    53575.48              172.83
## 47                   69.62  20    50983.75              202.25
## 48                   85.40  43    67058.72              198.72
## 49                   44.33  37    52723.34              123.72
## 50                   48.01  46    54286.10              119.93
## 51                   73.18  23    61526.25              196.71
## 52                   79.94  28    58526.04              225.29
## 53                   33.33  45    53350.11              193.58
## 54                   50.33  50    62657.53              133.20
## 55                   62.31  47    62722.57              119.30
## 56                   80.60  31    67479.62              177.55
## 57                   65.19  36    75254.88              150.61
## 58                   44.98  49    52336.64              129.31
## 59                   77.63  29    56113.37              239.22
```

```
## 60                  41.82  41    24852.90              156.36
## 61                  85.61  27    47708.42              183.43
## 62                  85.84  34    64654.66              192.93
## 63                  72.08  29    71228.44              169.50
## 64                  86.06  32    61601.05              178.92
## 65                  45.96  45    66281.46              141.22
## 66                  62.42  29    73910.90              198.50
## 67                  63.89  40    51317.33              105.22
## 68                  35.33  32    51510.18              200.22
## 69                  75.74  25    61005.87              215.25
## 70                  78.53  34    32536.98              131.72
## 71                  46.13  31    60248.97              139.01
## 72                  69.01  46    74543.81              222.63
## 73                  55.35  39    75509.61              153.17
## 74                  33.21  43    42650.32              167.07
## 75                  38.46  42    58183.04              145.98
## 76                  64.10  22    60465.72              215.93
## 77                  49.81  35    57009.76              120.06
## 78                  82.73  33    54541.56              238.99
## 79                  56.14  38    32689.04              113.53
## 80                  55.13  45    55605.92              111.71
## 81                  78.11  27    63296.87              209.25
## 82                  73.46  28    65653.47              222.75
## 83                  56.64  38    61652.53              115.91
## 84                  68.94  54    30726.26              138.71
## 85                  70.79  31    74535.94              184.10
## 86                  57.76  41    47861.93              105.15
## 87                  77.51  36    73600.28              200.55
## 88                  52.70  34    58543.94              118.60
## 89                  57.70  34    42696.67              109.07
## 90                  56.89  37    37334.78              109.29
## 91                  69.90  43    71392.53              138.35
## 92                  55.79  24    59550.05              149.67
## 93                  70.03  26    64264.25              227.72
## 94                  50.08  40    64147.86              125.85
## 95                  43.67  31    25686.34              166.29
## 96                  72.84  26    52968.22              238.63
## 97                  45.72  36    22473.08              154.02
## 98                  39.94  41    64927.19              156.30
## 99                  35.61  46    51868.85              158.22
## 100                 79.71  34    69456.83              211.65
## 101                 41.49  53    31947.65              169.18
## 102                 63.60  23    51864.77              235.28
## 103                 89.91  40    59593.56              194.23
## 104                 68.18  21    48376.14              218.17
## 105                 66.49  20    56884.74              202.16
## 106                 80.49  40    67186.54              229.12
## 107                 72.23  25    46557.92              241.03
## 108                 42.39  42    66541.05              150.99
## 109                 47.53  30    33258.09              135.18
## 110                 74.02  32    72272.90              210.54
## 111                 66.63  60    60333.38              176.98
## 112                 63.24  53    65229.13              235.78
## 113                 71.00  22    56067.38              211.87
```

```
## 114                 46.13  46    37838.72             123.64
## 115                 69.00  32    72683.35             221.21
## 116                 76.99  31    56729.78             244.34
## 117                 72.60  55    66815.54             162.95
## 118                 61.88  42    60223.52             112.19
## 119                 84.45  50    29727.79             207.18
## 120                 88.97  45    49269.98             152.49
## 121                 86.19  31    57669.41             210.26
## 122                 49.58  26    56791.75             231.94
## 123                 77.65  27    63274.88             212.79
## 124                 37.75  36    35466.80             225.24
## 125                 62.33  43    68787.09             127.11
## 126                 79.57  31    61227.59             230.93
## 127                 80.31  44    56366.88             127.07
## 128                 89.05  45    57868.44             206.98
## 129                 70.41  27    66618.21             223.03
## 130                 67.36  37    73104.47             233.56
## 131                 46.98  50    21644.91             175.37
## 132                 41.67  36    53817.02             132.55
## 133                 51.24  36    76368.31             176.73
## 134                 75.70  29    67633.44             215.44
## 135                 43.49  47    50335.46             127.83
## 137                 38.37  36    41229.16             140.46
## 138                 38.52  38    42581.23             137.28
## 139                 71.89  23    61617.98             172.81
## 140                 75.80  38    70575.60             146.19
## 141                 83.86  31    64122.36             190.25
## 142                 37.51  30    52097.32             163.00
## 143                 55.60  44    65953.76             124.38
## 144                 83.67  44    60192.72             234.26
## 145                 69.08  41    77460.07             210.60
## 146                 37.47  44    45716.48             141.89
## 147                 56.04  49    65120.86             128.95
## 148                 70.92  41    49995.63             108.16
## 149                 49.78  46    71718.51             152.24
## 150                 68.61  57    61770.34             150.29
## 151                 58.18  25    69112.84             176.28
## 152                 78.54  35    72524.86             172.10
## 153                 37.00  48    36782.38             158.22
## 154                 65.40  33    66699.12             247.31
## 155                 79.52  27    64287.78             183.48
## 156                 87.98  38    56637.59             222.11
## 157                 44.64  36    55787.58             127.01
## 158                 41.73  28    61142.33             202.18
## 159                 80.46  27    61625.87             207.96
## 160                 75.55  36    73234.87             159.24
## 161                 76.32  35    74166.24             195.31
## 162                 82.68  33    62669.59             222.77
## 163                 72.01  31    57756.89             251.00
## 164                 75.83  24    58019.64             162.44
## 165                 41.28  50    50960.08             140.39
## 166                 34.66  32    48246.60             194.83
## 167                 66.18  55    28271.84             143.42
## 168                 86.06  31    53767.12             219.72
```

```
## 169                59.59  42    43662.10              104.78
## 170                86.69  34    62238.58              198.56
## 171                43.77  52    49030.03              138.55
## 172                71.84  47    76003.47              199.79
## 173                80.23  31    68094.85              196.23
## 174                74.41  26    64395.85              163.05
## 175                63.36  48    70053.27              137.43
## 176                71.74  35    72423.97              227.56
## 177                60.72  44    42995.80              105.69
## 178                72.04  22    60309.58              199.43
## 179                44.57  31    38349.78              133.17
## 180                85.86  34    63115.34              208.23
## 181                39.85  38    31343.39              145.96
## 182                84.53  27    40763.13              168.34
## 183                62.95  60    36752.24              157.04
## 184                67.58  41    65044.59              255.61
## 185                85.56  29    53673.08              210.46
## 186                46.88  54    43444.86              136.64
## 187                46.31  57    44248.52              153.98
## 188                77.95  31    62572.88              233.65
## 189                84.73  30    39840.55              153.76
## 190                39.86  36    32593.59              145.85
## 191                50.08  30    41629.86              123.91
## 192                60.23  35    43313.73              106.86
## 193                60.70  49    42993.48              110.57
## 194                43.67  53    46004.31              143.79
## 195                77.20  33    49325.48              254.05
## 196                71.86  32    51633.34              116.53
## 197                44.78  45    63363.04              137.24
## 198                78.57  36    64045.93              239.32
## 199                73.41  31    73049.30              201.26
## 200                77.05  27    66624.60              191.14
## 201                66.40  40    77567.85              214.42
## 202                69.35  29    53431.35              252.77
## 203                35.65  40    31265.75              172.58
## 204                70.04  31    74780.74              183.85
## 205                69.78  29    70410.11              218.79
## 206                58.22  29    37345.24              120.90
## 207                76.90  28    66107.84              212.67
## 208                84.08  30    62336.39              187.36
## 209                59.51  58    39132.64              140.83
## 210                40.15  38    38745.29              134.88
## 211                76.81  28    65172.22              217.85
## 212                41.89  38    68519.96              163.38
## 213                76.87  27    54774.77              235.35
## 214                67.28  43    76246.96              155.80
## 215                81.98  40    65461.92              229.22
## 216                66.01  23    34127.21              151.95
## 217                61.57  53    35253.98              125.94
## 218                53.30  34    44893.71              111.94
## 219                34.87  40    59621.02              200.23
## 220                43.60  38    20856.54              170.49
## 221                77.88  37    55353.41              254.57
## 222                75.83  27    67516.07              200.59
```

```
## 223                49.95  39    68737.75              136.59
## 224                60.94  41    76893.84              154.97
## 225                89.15  42    59886.58              171.07
## 226                78.70  30    53441.69              133.99
## 227                57.35  29    41356.31              119.84
## 228                34.86  38    49942.66              154.75
## 229                70.68  31    74430.08              199.08
## 230                76.06  23    58633.63              201.04
## 231                66.67  33    72707.87              228.03
## 232                46.77  32    31092.93              136.40
## 233                62.42  38    74445.18              143.94
## 234                78.32  28    49309.14              239.52
## 235                37.32  50    56735.14              199.25
## 236                40.42  45    40183.75              133.90
## 237                76.77  36    58348.41              123.51
## 238                65.65  30    72209.99              158.05
## 239                74.32  33    62060.11              128.17
## 240                73.27  32    67113.46              234.75
## 241                80.03  44    24030.06              150.84
## 242                53.68  47    56180.93              115.26
## 243                85.84  32    62204.93              192.85
## 244                85.03  30    60372.64              204.52
## 245                70.44  24    65280.16              178.75
## 246                81.22  53    34309.24              223.09
## 247                39.96  45    59610.81              146.13
## 248                57.05  41    50278.89              269.96
## 249                42.44  56    43450.11              168.27
## 250                62.20  25    25408.21              161.16
## 251                76.70  36    71136.49              222.25
## 252                61.22  45    63883.81              119.03
## 253                84.54  33    64902.47              204.02
## 254                46.08  30    66784.81              164.63
## 255                56.70  48    62784.85              123.13
## 256                81.03  28    63727.50              201.15
## 257                80.91  32    61608.23              231.42
## 258                40.06  38    56782.18              138.68
## 259                83.47  39    64447.77              226.11
## 260                73.84  31    42042.95              121.05
## 261                74.65  28    67669.06              212.56
## 262                60.25  35    54875.95              109.77
## 263                59.21  35    73347.67              144.62
## 264                43.02  44    50199.77              125.22
## 265                84.04  38    50723.67              244.55
## 266                70.66  43    63450.96              120.95
## 267                70.58  26    56694.12              136.94
## 268                72.44  34    70547.16              230.14
## 269                40.17  26    47391.95              171.31
## 270                79.15  26    62312.23              203.23
## 271                44.49  53    63100.13              168.00
## 272                73.04  37    73687.50              221.79
## 273                76.28  33    52686.47              254.34
## 274                68.88  37    78119.50              179.58
## 275                73.10  28    57014.84              242.37
## 276                47.66  29    27086.40              156.54
```

```
## 277  87.30  35  58337.18  216.87
## 278  89.34  32  50216.01  177.78
## 279  81.37  26  53049.44  156.48
## 280  81.67  28  62927.96  196.76
## 281  46.37  52  32847.53  144.27
## 282  54.88  24  32006.82  148.61
## 283  40.67  35  48913.07  133.18
## 284  71.76  35  69285.69  237.39
## 285  47.51  51  53700.57  130.41
## 286  75.15  22  52011.00  212.87
## 287  56.01  26  46339.25  127.26
## 288  82.87  37  67938.77  213.36
## 289  45.05  42  66348.95  141.36
## 290  60.53  24  66873.90  167.22
## 291  50.52  31  72270.88  171.62
## 292  84.71  32  61610.05  210.23
## 293  55.20  39  76560.59  159.46
## 294  81.61  33  62667.51  228.76
## 295  71.55  36  75687.46  163.99
## 296  82.40  36  66744.65  218.97
## 297  73.95  35  67714.82  238.58
## 298  72.07  31  69710.51  226.45
## 299  80.39  31  66269.49  214.74
## 300  65.80  25  60843.32  231.49
## 301  69.97  28  55041.60  250.00
## 302  52.62  50  73863.25  176.52
## 303  39.25  39  62378.05  152.36
## 304  77.56  38  63336.85  130.83
## 305  33.52  43  42191.61  165.56
## 306  79.81  24  56194.56  178.85
## 307  84.79  33  61771.90  214.53
## 308  82.70  35  61383.79  231.07
## 309  84.88  32  63924.82  186.48
## 310  54.92  54  23975.35  161.16
## 311  76.56  34  70179.11  221.53
## 312  69.74  49  66524.80  243.37
## 313  75.55  22  41851.38  169.40
## 314  72.19  33  61275.18  250.35
## 315  84.29  41  60638.38  232.54
## 316  73.89  39  47160.53  110.68
## 317  75.84  21  48537.18  186.98
## 318  73.38  25  53058.91  236.19
## 319  80.72  31  68614.98  186.37
## 320  62.06  44  44174.25  105.00
## 321  51.50  34  67050.16  135.31
## 322  90.97  37  54520.14  180.77
## 323  86.78  30  54952.42  170.13
## 324  66.18  35  69476.42  243.61
## 325  84.33  41  54989.93  240.95
## 326  36.87  36  29398.61  195.91
## 327  34.78  48  42861.42  208.21
## 328  76.84  32  65883.39  231.59
## 329  67.05  25  65421.39  220.92
## 330  41.47  31  60953.93  219.79
```

```
## 331  80.71  26  58476.57  200.58
## 332  80.09  31  66636.84  214.08
## 333  56.30  49  67430.96  135.24
## 334  79.36  34  57260.41  245.78
## 335  86.38  40  66359.32  188.27
## 336  38.94  41  57587.00  142.67
## 337  87.26  35  63060.55  184.03
## 338  75.32  28  59998.50  233.60
## 339  74.38  40  74024.61  220.05
## 340  65.90  22  60550.66  211.39
## 341  36.31  47  57983.30  168.92
## 342  72.23  48  52736.33  115.35
## 343  88.12  38  46653.75  230.91
## 344  83.97  28  56986.73  205.50
## 345  61.09  26  55336.18  131.68
## 346  65.77  21  42162.90  218.61
## 347  81.58  25  39699.13  199.39
## 348  37.87  52  56394.82  188.56
## 349  76.20  37  75044.35  178.51
## 350  60.91  19  53309.61  184.94
## 351  74.49  28  58996.12  237.34
## 352  73.71  23  56605.12  211.38
## 353  78.19  30  62475.99  228.81
## 354  79.54  44  70492.60  217.68
## 355  74.87  52  43698.53  126.97
## 356  87.09  36  57737.51  221.98
## 357  37.45  47  31281.01  167.86
## 358  49.84  39  45800.48  111.59
## 359  51.38  59  42362.49  158.56
## 360  83.40  34  66691.23  207.87
## 361  38.91  33  56369.74  150.80
## 362  62.14  41  59397.89  110.93
## 363  79.72  28  66025.11  193.80
## 364  73.30  36  68211.35  135.72
## 365  69.11  42  73608.99  231.48
## 366  71.90  54  61228.96  140.15
## 367  72.45  29  72325.91  195.36
## 368  77.07  40  44559.43  261.02
## 369  74.62  36  73207.15  217.79
## 370  82.07  25  46722.07  205.38
## 371  58.60  50  45400.50  113.70
## 372  36.08  45  41417.27  151.47
## 373  79.44  26  60845.55  206.79
## 374  41.73  47  60812.77  144.71
## 375  73.19  25  64267.88  203.74
## 376  77.60  24  58151.87  197.33
## 377  89.00  37  52079.18  222.26
## 378  69.20  42  26023.99  123.80
## 379  67.56  31  62318.38  125.45
## 380  81.11  39  56216.57  248.19
## 381  80.22  30  61806.31  224.58
## 382  43.63  41  51662.24  123.25
## 383  77.66  29  67080.94  168.15
## 384  74.63  26  51975.41  235.99
```

```
## 385                49.67  27    28019.09              153.69
## 386                80.59  37    67744.56              224.23
## 387                83.49  33    66574.00              190.75
## 388                44.46  42    30487.48              132.66
## 389                68.10  40    74903.41              227.73
## 390                63.88  38    19991.72              136.85
## 391                78.83  36    66050.63              234.64
## 392                79.97  44    70449.04              216.00
## 393                80.51  28    64008.55              200.28
## 394                62.26  26    70203.74              202.77
## 395                66.99  47    27262.51              124.44
## 396                71.05  20    49544.41              204.22
## 397                42.05  51    28357.27              174.55
## 398                50.52  28    66929.03              219.69
## 399                76.24  40    75524.78              198.32
## 400                77.29  27    66265.34              201.24
## 401                35.98  47    55993.68              165.52
## 402                84.95  34    56379.30              230.36
## 403                39.34  43    31215.88              148.93
## 404                87.23  29    51015.11              202.12
## 405                57.24  52    46473.14              117.35
## 406                81.58  41    55479.62              248.16
## 407                56.34  50    68713.70              139.02
## 408                48.73  27    34191.23              142.04
## 409                51.68  49    51067.54              258.62
## 410                35.34  45    46693.76              152.86
## 411                48.09  33    19345.36              180.42
## 412                78.68  29    66225.72              208.05
## 413                68.82  20    38609.20              205.64
## 414                56.99  40    37713.23              108.15
## 415                86.63  39    63764.28              209.64
## 416                41.18  43    41866.55              129.25
## 417                71.03  32    57846.68              120.85
## 418                72.92  29    69428.73              217.10
## 419                77.14  24    60283.98              184.88
## 420                60.70  43    79332.33              192.60
## 421                34.30  41    53167.68              160.74
## 422                83.71  45    64564.07              220.48
## 423                53.38  35    60803.37              120.06
## 424                58.03  31    28387.42              129.33
## 425                43.59  36    58849.77              132.31
## 426                60.07  42    65963.37              120.75
## 427                54.43  37    75180.20              154.74
## 428                81.99  33    61270.14              230.90
## 429                60.53  29    56759.48              123.28
## 430                84.69  31    46160.63              231.85
## 431                88.72  32    43870.51              211.87
## 432                88.89  35    50439.49              218.80
## 433                69.58  43    28028.74              255.07
## 434                85.23  36    64238.71              212.92
## 435                83.55  39    65816.38              221.18
## 436                56.66  42    72684.44              139.42
## 437                56.39  27    38817.40              248.12
## 438                76.24  27    63976.44              214.42
```

```
## 439                57.64  36    37212.54              110.25
## 440                78.18  23    52691.79              167.67
## 441                46.04  32    65499.93              147.92
## 442                79.40  35    63966.72              236.87
## 443                36.44  39    52400.88              147.64
## 444                53.14  38    49111.47              109.00
## 445                32.84  40    41232.89              171.72
## 446                73.72  32    52140.04              256.40
## 447                38.10  34    60641.09              214.38
## 448                73.93  44    74180.05              218.22
## 449                51.87  50    51869.87              119.65
## 450                77.69  22    48852.58              169.88
## 451                43.41  28    59144.02              160.73
## 452                55.92  24    33951.63              145.08
## 453                80.67  34    58909.36              239.76
## 454                83.42  25    49850.52              183.42
## 455                82.12  52    28679.93              201.15
## 456                66.17  33    69869.66              238.45
## 457                43.01  35    48347.64              127.37
## 458                80.05  25    45959.86              219.94
## 459                64.88  42    70005.51              129.80
## 460                79.82  26    51512.66              223.28
## 461                48.03  40    25598.75              134.60
## 462                32.99  45    49282.87              177.46
## 463                74.88  27    67240.25              175.17
## 464                36.49  52    42136.33              196.61
## 465                88.04  45    62589.84              191.17
## 466                45.70  33    67384.31              151.12
## 467                82.38  35    25603.93              159.60
## 468                52.68  23    39616.00              149.20
## 469                65.59  47    28265.81              121.81
## 470                65.65  25    63879.72              224.92
## 471                43.84  36    70592.81              167.42
## 472                67.69  37    76408.19              216.57
## 473                78.37  24    55015.08              207.27
## 474                81.46  29    51636.12              231.54
## 475                47.48  31    29359.20              141.34
## 476                75.15  33    71296.67              219.49
## 477                78.76  24    46422.76              219.98
## 478                44.96  50    52802.00              132.71
## 479                39.56  41    59243.46              143.13
## 480                39.76  28    35350.55              196.83
## 481                57.11  22    59677.64              207.17
## 482                83.26  40    70225.60              187.76
## 483                69.42  25    65791.17              213.38
## 484                50.60  30    34191.13              129.88
## 485                46.20  37    51315.38              119.30
## 486                66.88  35    62790.96              119.47
## 487                83.97  40    66291.67              158.42
## 488                76.56  30    68030.18              213.75
## 489                35.49  48    43974.49              159.77
## 490                80.29  31    49457.48              244.87
## 491                50.19  40    33987.27              117.30
## 492                59.12  33    28210.03              124.54
```

```
## 493  59.88  30  75535.14  193.63
## 494  59.70  28  49158.50  120.25
## 495  67.80  30  39809.69  117.75
## 496  81.59  35  65826.53  223.16
## 497  81.10  29  61172.07  216.49
## 498  41.70  39  42898.21  126.95
## 499  73.94  27  68333.01  173.49
## 500  58.35  37  70232.95  132.63
## 501  51.56  46  63102.19  124.85
## 502  79.81  37  51847.26  253.17
## 503  66.17  26  63580.22  228.70
## 504  58.21  37  47575.44  105.94
## 505  66.12  49  39031.89  113.80
## 506  80.47  42  70505.06  215.18
## 507  77.05  31  62161.26  236.64
## 508  49.99  41  61068.26  121.07
## 509  80.30  58  49090.51  173.43
## 510  79.36  33  62330.75  234.72
## 512  70.29  26  62053.37  231.37
## 513  84.53  33  61922.06  215.18
## 514  59.13  44  49525.37  106.04
## 515  81.51  41  53412.32  250.03
## 516  42.94  37  56681.65  130.40
## 517  84.81  32  43299.63  233.93
## 518  82.79  34  47997.75  132.08
## 519  59.22  55  39131.53  126.39
## 520  35.00  40  46033.73  151.25
## 521  46.61  42  65856.74  136.18
## 522  63.26  29  54787.37  120.46
## 523  79.16  32  69562.46  202.90
## 524  67.94  43  68447.17  128.16
## 525  79.91  32  62772.42  230.18
## 526  66.14  41  78092.95  165.27
## 527  43.65  39  63649.04  138.87
## 528  59.61  21  60637.62  198.45
## 529  46.61  52  27241.11  156.99
## 530  89.37  34  42760.22  162.03
## 531  65.10  49  59457.52  118.10
## 532  53.44  42  42907.89  108.17
## 533  79.53  51  46132.18  244.91
## 534  91.43  39  46964.11  209.91
## 535  73.57  30  70377.23  212.38
## 536  78.76  32  70012.83  208.02
## 537  76.49  23  56457.01  181.11
## 538  61.72  26  67279.06  218.49
## 539  84.53  35  54773.99  236.29
## 540  72.03  34  70783.94  230.95
## 541  77.47  36  70510.59  222.91
## 542  75.65  39  64021.55  247.90
## 543  78.15  33  72042.85  194.37
## 544  63.80  38  36037.33  108.70
## 545  76.59  29  67526.92  211.64
## 546  42.60  55  55121.65  168.29
## 547  78.77  28  63497.62  211.83
```

```
## 548                83.40  39    60879.48              235.01
## 549                79.53  33    61467.33              236.72
## 550                73.89  35    70495.64              229.99
## 551                75.80  36    71222.40              224.90
## 552                81.95  31    64698.58              208.76
## 553                56.39  58    32252.38              154.23
## 554                44.73  35    55316.97              127.56
## 555                38.35  33    47447.89              145.48
## 556                72.53  37    73474.82              223.93
## 557                56.20  49    53549.94              114.85
## 558                79.67  28    58576.12              226.79
## 559                75.42  26    63373.70              164.25
## 560                78.64  31    60283.47              235.28
## 561                67.69  44    37345.34              109.22
## 562                38.35  41    34886.01              144.69
## 563                59.52  44    67511.86              251.08
## 564                62.26  37    77988.71              166.19
## 565                64.75  36    63001.03              117.66
## 566                79.97  26    61747.98              185.45
## 567                47.90  42    48467.68              114.53
## 568                80.38  30    55130.96              238.06
## 569                64.51  42    79484.80              190.71
## 570                71.28  37    67307.43              246.72
## 571                50.32  40    27964.60              125.65
## 572                72.76  33    66431.87              240.63
## 573                72.80  35    63551.67              249.54
## 574                74.59  23    40135.06              158.35
## 575                46.66  45    49101.67              118.16
## 576                48.86  54    53188.69              134.46
## 577                37.05  39    49742.83              142.81
## 578                81.21  36    63394.41              233.04
## 579                66.89  23    64433.99              208.24
## 580                68.11  38    73884.48              231.21
## 581                69.15  46    36424.94              112.72
## 582                65.72  36    28275.48              120.12
## 583                40.04  27    48098.86              161.58
## 584                68.60  33    68448.94              135.08
## 585                56.16  25    66429.84              164.25
## 586                78.60  46    41768.13              254.59
## 587                78.29  38    57844.96              252.07
## 588                43.83  45    35684.82              129.01
## 589                77.31  32    62792.43              238.10
## 590                39.86  28    51171.23              161.24
## 591                66.77  25    58847.07              141.13
## 592                57.20  42    57739.03              110.66
## 593                73.15  25    64631.22              211.12
## 594                82.07  24    50337.93              193.97
## 595                49.84  38    67781.31              135.24
## 596                43.97  36    68863.95              156.97
## 597                77.25  27    55901.12              231.38
## 598                74.84  37    64775.10              246.44
## 599                83.53  36    67686.16              204.56
## 600                38.63  48    57777.11              222.11
## 601                84.00  48    46868.53              136.21
```

```
## 602                52.13  50    40926.93              118.27
## 603                71.83  40    22205.74              135.48
## 604                78.36  24    58920.44              196.77
## 605                50.18  35    63006.14              127.82
## 606                64.67  51    24316.61              138.35
## 607                69.50  26    68348.99              203.84
## 608                65.22  30    66263.37              240.09
## 609                62.06  40    63493.60              116.27
## 610                84.29  30    56984.09              160.33
## 611                32.91  37    51691.55              181.02
## 612                39.50  31    49911.25              148.19
## 613                75.19  31    33502.57              245.76
## 614                76.21  31    65834.97              228.94
## 615                67.76  31    66176.97              242.59
## 616                40.01  53    51463.17              161.77
## 617                52.70  41    41059.64              109.34
## 618                68.41  38    61428.18              259.76
## 619                35.55  39    51593.46              151.18
## 620                74.54  24    57518.73              219.75
## 621                81.75  24    52656.13              190.08
## 622                87.85  31    52178.98              210.27
## 623                60.23  60    46239.14              151.54
## 624                87.97  35    48918.55              149.25
## 625                78.17  27    65227.79              192.27
## 626                67.91  23    55002.05              146.80
## 627                85.77  27    52261.73              191.78
## 628                41.16  49    59448.44              150.83
## 629                53.54  39    47314.45              108.03
## 630                73.94  26    55411.06              236.15
## 631                63.43  29    66504.16              236.75
## 632                84.59  36    47169.14              241.80
## 633                70.13  31    70889.68              224.98
## 634                40.19  37    55358.88              136.99
## 635                58.95  55    56242.70              131.29
## 636                35.76  51    45522.44              195.07
## 637                59.36  49    46931.03              110.84
## 638                91.10  40    55499.69              198.13
## 639                61.04  41    75805.12              149.21
## 640                74.06  23    40345.49              225.99
## 642                81.29  28    33239.20              219.72
## 643                76.07  36    68033.54              235.56
## 644                75.92  22    38427.66              182.65
## 645                78.35  46    53185.34              253.48
## 646                46.14  28    39723.97              137.97
## 647                44.33  41    43386.07              120.63
## 648                46.43  28    53922.43              137.20
## 649                66.04  27    71881.84              199.76
## 650                84.31  29    47139.21              225.87
## 651                83.66  38    68877.02              175.14
## 652                81.25  33    65186.58              222.35
## 653                85.26  32    55424.24              224.07
## 654                86.53  46    46500.11              233.36
## 655                76.44  26    58820.16              224.20
## 656                52.84  43    28495.21              122.31
```

```
## 657                85.24  31    61840.26              182.84
## 658                74.71  46    37908.29              258.06
## 659                82.95  39    69805.70              201.29
## 660                76.42  26    60315.19              223.16
## 661                42.04  49    67323.00              182.11
## 662                46.28  26    50055.33              228.78
## 663                48.26  50    43573.66              122.45
## 664                71.03  55    28186.65              150.77
## 665                81.37  33    66412.04              215.04
## 667                75.00  29    63965.16              230.36
## 668                79.61  31    58342.63              235.97
## 669                52.56  31    33147.19              250.36
## 670                62.18  33    65899.68              126.44
## 671                77.89  26    64188.50              201.54
## 672                66.08  61    58966.22              184.23
## 673                89.21  33    44078.24              210.53
## 674                49.96  55    60968.62              151.94
## 675                77.44  28    65620.25              210.39
## 676                82.58  38    65496.78              225.23
## 677                39.36  29    52462.04              161.79
## 678                47.23  38    70582.55              149.80
## 679                87.85  34    51816.27              153.01
## 680                65.57  46    23410.75              130.86
## 681                78.01  26    62729.40              200.71
## 682                44.15  28    48867.67              141.96
## 683                43.57  36    50971.73              125.20
## 684                76.83  28    67990.84              192.81
## 685                42.06  34    43241.19              131.55
## 686                76.27  27    60082.66              226.69
## 687                74.27  37    65180.97              247.05
## 688                73.27  28    67301.39              216.24
## 689                74.58  36    70701.31              230.52
## 690                77.50  28    60997.84              225.34
## 691                87.16  33    60805.93              197.15
## 692                87.16  37    50711.68              231.95
## 694                65.15  29    41335.84              117.30
## 695                68.25  33    76480.16              198.86
## 696                73.49  38    67132.46              244.23
## 697                39.19  54    52581.16              173.05
## 698                80.15  25    55195.61              214.49
## 699                86.76  28    48679.54              189.91
## 700                73.88  29    63109.74              233.61
## 701                58.60  19    44490.09              197.93
## 702                69.77  54    57667.99              132.27
## 703                87.27  30    51824.01              204.27
## 704                77.65  28    66198.66              208.01
## 705                76.02  40    73174.19              219.55
## 706                78.84  26    56593.80              217.66
## 707                71.33  23    31072.44              169.40
## 708                81.90  41    66773.83              225.47
## 709                46.89  48    72553.94              176.78
## 710                77.80  57    43708.88              152.94
## 711                45.44  43    48453.55              119.27
## 712                69.96  31    73413.87              214.06
```

```
## 713  87.35  35  58114.30  158.29
## 714  49.42  53  45465.25  128.00
## 715  71.27  21  50147.72  216.03
## 716  49.19  38  61004.51  123.08
## 717  39.96  35  53898.89  138.52
## 718  85.01  29  59797.64  192.50
## 719  68.95  51  74623.27  185.85
## 720  67.59  45  58677.69  113.69
## 721  75.71  34  62109.80  246.06
## 722  43.07  36  60583.02  137.63
## 723  39.47  43  65576.05  163.48
## 724  48.22  40  73882.91  214.33
## 725  76.76  25  50468.36  230.77
## 726  78.74  27  51409.45  234.75
## 727  67.47  24  60514.05  225.05
## 728  81.17  30  57195.96  231.91
## 729  89.66  34  52802.58  171.23
## 730  79.60  28  56570.06  227.37
## 731  65.53  19  51049.47  190.17
## 732  61.87  35  66629.61  250.20
## 733  83.16  41  70185.06  194.95
## 734  44.11  41  43111.41  121.24
## 735  56.57  26  56435.60  131.98
## 736  83.91  29  53223.58  222.87
## 737  79.80  28  57179.91  229.88
## 738  71.23  52  41521.28  122.59
## 739  47.23  43  73538.09  210.87
## 740  82.37  30  63664.32  207.44
## 741  43.63  38  61757.12  135.25
## 742  70.90  28  71727.51  190.95
## 743  71.90  29  72203.96  193.29
## 744  62.12  37  50671.60  105.86
## 745  67.35  29  47510.42  118.69
## 746  57.99  50  62466.10  124.58
## 747  66.80  29  59683.16  248.51
## 748  49.13  32  41097.17  120.49
## 749  45.11  58  39799.73  195.69
## 750  54.35  42  76984.21  164.02
## 751  61.82  59  57877.15  151.93
## 752  77.75  31  59047.91  240.64
## 753  70.61  28  72154.68  190.12
## 754  82.72  31  65704.79  179.82
## 755  76.87  36  72948.76  212.59
## 756  65.07  34  73941.91  227.53
## 757  56.93  37  57887.64  111.80
## 758  48.86  35  62463.70  128.37
## 759  36.56  29  42838.29  195.89
## 760  85.73  32  43778.88  147.75
## 761  75.81  40  71157.05  229.19
## 762  72.94  31  74159.69  190.84
## 763  53.63  54  50333.72  126.29
## 764  52.35  25  33293.78  147.61
## 765  52.84  51  38641.20  121.57
## 766  51.58  33  49822.78  115.91
```

```
## 767                42.32  29    63891.29              187.09
## 768                55.04  42    43881.73              106.96
## 770                85.54  27    48761.14              175.43
## 771                71.14  30    69758.31              224.82
## 772                64.38  19    52530.10              180.47
## 773                88.85  40    58363.12              213.96
## 774                66.79  60    60575.99              198.30
## 775                32.60  45    48206.04              185.47
## 776                43.88  54    31523.09              166.85
## 777                56.46  26    66187.58              151.63
## 778                72.18  30    69438.04              225.02
## 780                80.55  35    68016.90              219.91
## 781                67.85  41    78520.99              202.70
## 782                75.55  36    31998.72              123.71
## 783                80.46  29    56909.30              230.78
## 784                82.69  29    61161.29              167.41
## 785                35.21  39    52340.10              154.00
## 786                36.37  40    47338.94              144.53
## 787                74.07  22    50950.24              165.43
## 788                59.96  33    77143.61              197.66
## 789                85.62  29    57032.36              195.68
## 790                40.88  33    48554.45              136.18
## 791                36.98  31    39552.49              167.87
## 792                35.49  47    36884.23              170.04
## 793                56.56  26    68783.45              204.47
## 794                36.62  32    51119.93              162.44
## 795                49.35  49    44304.13              119.86
## 796                75.64  29    69718.19              204.82
## 797                79.22  27    63429.18              198.79
## 798                77.05  34    65756.36              236.08
## 799                66.83  46    77871.75              196.17
## 800                76.20  24    47258.59              228.81
## 801                56.64  29    55984.89              123.24
## 802                53.33  34    44275.13              111.63
## 803                50.63  50    25767.16              142.23
## 804                41.84  49    37605.11              139.32
## 805                53.92  41    25739.09              125.46
## 806                83.89  28    60188.38              180.88
## 807                55.32  43    67682.32              127.65
## 808                53.22  44    44307.18              108.85
## 809                43.16  35    25371.52              156.11
## 810                67.51  43    23942.61              127.20
## 811                43.16  29    50666.50              143.04
## 812                79.89  30    50356.06              241.38
## 813                84.25  32    63936.50              170.90
## 814                74.18  28    69874.18              203.87
## 815                85.78  34    50038.65              232.78
## 816                80.96  39    67866.95              225.00
## 817                36.91  48    54645.20              159.69
## 818                54.47  23    46780.09              141.52
## 819                81.98  34    67432.49              212.88
## 820                79.60  39    73392.28              194.23
## 821                57.51  38    47682.28              105.71
## 822                82.30  31    56735.83              232.21
```

```
## 823  73.21  30  51013.37  252.60
## 824  79.09  32  69481.85  209.72
## 825  68.47  28  67033.34  226.64
## 826  83.69  36  68717.00  192.57
## 827  83.48  31  59340.99  222.72
## 828  43.49  45  47968.32  124.67
## 829  66.69  35  48758.92  108.27
## 830  48.46  49  61230.03  132.38
## 831  42.51  30  54755.71  144.77
## 832  42.83  34  54324.73  132.38
## 833  41.46  42  52177.40  128.98
## 834  45.99  33  51163.14  124.61
## 835  68.72  27  66861.67  225.97
## 836  63.11  34  63107.88  254.94
## 837  49.21  46  49206.40  115.60
## 838  55.77  49  55942.04  117.33
## 839  44.13  40  33601.84  128.48
## 840  57.82  46  48867.36  107.56
## 841  72.46  40  56683.32  113.53
## 842  61.88  45  38260.89  108.18
## 843  78.24  23  54106.21  199.29
## 844  74.61  38  71055.22  231.28
## 845  89.18  37  46403.18  224.01
## 846  44.16  42  61690.93  133.42
## 847  55.74  37  26130.93  124.34
## 848  88.82  36  58638.75  169.10
## 849  70.39  32  47357.39  261.52
## 850  59.05  52  50086.17  118.45
## 851  78.58  33  51772.58  250.11
## 852  35.11  35  47638.30  158.03
## 853  60.39  45  38987.42  108.25
## 854  81.56  26  51363.16  213.70
## 855  75.03  34  35764.49  255.57
## 856  50.87  24  62939.50  190.41
## 857  82.80  30  58776.67  223.20
## 858  78.51  25  59106.12  205.71
## 859  37.65  51  50457.01  161.29
## 860  83.17  43  54251.78  244.40
## 861  91.37  45  51920.49  182.65
## 862  68.25  29  70324.80  220.08
## 863  81.32  25  52416.18  165.65
## 864  76.64  39  66217.31  241.50
## 865  74.06  50  60938.73  246.29
## 866  39.53  33  40243.82  142.21
## 867  86.58  32  60151.77  195.93
## 868  90.75  40  45945.88  216.50
## 869  67.71  25  63430.33  225.76
## 870  82.41  36  65882.81  222.08
## 871  45.82  27  64410.80  171.24
## 872  76.79  27  55677.12  235.94
## 873  70.05  33  75560.65  203.44
## 874  72.19  32  61067.58  250.32
## 875  77.35  34  72330.57  167.26
## 876  40.34  29  32549.95  173.75
```

```
## 877                67.39  44    51257.26            107.19
## 878                68.68  34    77220.42            187.03
## 879                81.75  43    52520.75            249.45
## 880                66.03  22    59422.47            217.37
## 881                47.74  33    22456.04            154.93
## 882                79.18  31    58443.99            236.96
## 883                86.81  29    50820.74            199.62
## 884                41.53  42    67575.12            158.81
## 885                70.92  39    66522.79            249.81
## 886                46.84  45    34903.67            123.22
## 887                44.40  53    43073.78            140.95
## 888                52.17  44    57594.70            115.37
## 889                81.45  31    66027.31            205.84
## 890                54.08  36    53012.94            111.02
## 891                76.65  31    61117.50            238.43
## 892                54.39  20    52563.22            171.90
## 893                37.74  40    65773.49            190.95
## 894                69.86  25    50506.44            241.36
## 895                85.37  36    66262.59            194.56
## 896                80.99  26    35521.88            207.53
## 897                78.84  32    62430.55            235.29
## 898                77.36  41    49597.08            115.79
## 899                55.46  37    42078.89            108.10
## 900                35.66  45    46197.59            151.72
## 901                50.78  51    49957.00            122.04
## 902                40.47  38    24078.93            203.90
## 903                45.62  43    53647.81            121.28
## 904                84.76  30    61039.13            178.69
## 905                80.64  26    46974.15            221.59
## 906                75.94  27    53042.51            236.96
## 907                37.01  50    48826.14            216.01
## 908                87.18  31    58287.86            193.60
## 909                56.91  50    21773.22            146.44
## 910                75.24  24    52252.91            226.49
## 911                42.84  52    27073.27            182.20
## 912                67.56  47    50628.31            109.98
## 913                34.96  42    36913.51            160.49
## 914                87.46  37    61009.10            211.56
## 915                41.86  39    53041.77            128.62
## 916                34.04  34    40182.84            174.88
## 917                54.96  42    59419.78            113.75
## 918                87.14  31    58235.21            199.40
## 919                78.79  32    68324.48            215.29
## 920                65.56  25    69646.35            181.25
## 921                81.05  34    54045.39            245.50
## 922                55.71  37    57806.03            112.52
## 923                45.48  49    53336.76            129.16
## 924                47.00  56    50491.45            149.53
## 925                59.64  51    71455.62            153.12
## 926                35.98  45    43241.88            150.79
## 927                72.55  22    58953.01            202.34
## 928                91.15  38    36834.04            184.98
## 929                80.53  29    66345.10            187.64
## 930                82.49  45    38645.40            130.84
```

```
## 931  80.94  36  60803.00  239.94
## 932  61.76  34  33553.90  114.69
## 933  63.30  38  63071.34  116.19
## 934  36.73  34  46737.34  149.79
## 935  78.41  33  55368.67  248.23
## 936  83.98  36  68305.91  194.62
## 937  63.18  45  39211.49  107.92
## 938  50.60  48  65956.71  135.67
## 939  32.60  38  40159.20  190.05
## 940  60.83  19  40478.83  185.46
## 941  44.72  46  40468.53  123.86
## 942  78.76  51  66980.27  162.05
## 943  79.51  39  34942.26  125.11
## 944  39.30  32  48335.20  145.73
## 945  64.79  30  42251.59  116.07
## 946  89.80  36  57330.43  198.24
## 947  72.82  34  75769.82  191.82
## 948  38.65  31  51812.71  154.77
## 949  59.01  30  75265.96  178.75
## 950  78.96  50  69868.48  193.15
## 951  63.99  43  72802.42  138.46
## 952  41.35  27  39193.45  162.46
## 954  45.53  29  56129.89  141.58
## 955  51.65  31  58996.56  249.99
## 956  54.55  44  41547.62  109.04
## 957  35.66  36  59240.24  172.57
## 958  69.95  28  56725.47  247.01
## 959  79.83  29  55764.43  234.23
## 960  85.35  37  64235.51  161.42
## 961  56.78  28  39939.39  124.32
## 962  78.67  26  63319.99  195.56
## 963  70.09  21  54725.87  211.17
## 964  60.75  42  69775.75  247.05
## 965  65.07  24  57545.56  233.85
## 966  35.25  50  47051.02  194.44
## 967  37.58  52  51600.47  176.70
## 968  68.01  25  68357.96  188.32
## 969  45.08  38  35349.26  125.27
## 970  63.04  27  69784.85  159.05
## 971  40.18  29  50760.23  151.96
## 972  45.17  48  34418.09  132.07
## 973  50.48  50  20592.99  162.43
## 974  80.87  28  63528.80  203.30
## 975  41.88  40  44217.68  126.11
## 976  39.87  48  47929.83  139.34
## 977  61.84  45  46024.29  105.63
## 978  54.97  31  51900.03  116.38
## 979  71.40  30  72188.90  166.31
## 980  70.29  31  56974.51  254.65
## 981  67.26  57  25682.65  168.41
## 982  76.58  46  41884.64  258.26
## 983  54.37  38  72196.29  140.77
## 984  82.79  32  54429.17  234.81
## 985  66.47  31  58037.66  256.39
```

```
## 986                    72.88  44    64011.26              125.12
## 987                    76.44  28    59967.19              232.68
## 988                    63.37  43    43155.19              105.04
## 989                    89.71  48    51501.38              204.40
## 990                    70.96  31    55187.85              256.40
## 991                    35.79  44    33813.08              165.62
## 992                    38.96  38    36497.22              140.67
## 993                    69.17  40    66193.81              123.62
## 994                    64.20  27    66200.96              227.63
## 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
```

```
cor(X)
```

```
##                          Daily.Time.Spent.on.Site        Age Area.Income
## Daily.Time.Spent.on.Site                1.0000000 -0.3322762   0.3150374
## Age                                    -0.3322762  1.0000000  -0.1801110
## Area.Income                             0.3150374 -0.1801110   1.0000000
## Daily.Internet.Usage                    0.5197228 -0.3679358   0.3508222
##                          Daily.Internet.Usage
## Daily.Time.Spent.on.Site            0.5197228
## Age                                -0.3679358
## Area.Income                         0.3508222
## Daily.Internet.Usage                1.0000000
```

Daily internet usage is positively correlated with daily time spent on site at 0.52.