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Accredited University

Statistical Techniques Using R Lab
Minor Project
Code - 24CAP-614

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Submitted to:

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Task: Choose a dataset from a repository like Kaggle or UCI Machine Learning Repository and perform exploratory data analysis using R. Explore the distribution of variables, identify outliers, and visualize relationships between variables using plots like histograms, scatter plots, and boxplots.

Code:

```
unzip("C:\\Users\\PRANSHUL GUPTA\\Downloads\\archive.zip",exdir="C:\\Users\\PRANSHUL GUPTA\\Downloads\\archive")
files<-list.files("C:\\Users\\PRANSHUL GUPTA\\Downloads\\archive",full.names=TRUE)
files
D<-read.csv("C:\\Users\\PRANSHUL GUPTA\\Downloads\\archive/user_behavior_dataset.csv")
D

#understand its structure
head(D)          #it display the first few rows
str(D)           #check the structure of dataset
summary(D)                  #summary of dataset
install.packages("dypler")
is.na(D$Age)
View(D)              #use to display the dataset
names(D)             #use to display the col names

#aggreation of dataset
```

```
 #aggregate(dependent~independent,dataname,function)

aggregate(Screen.On.Time..hours.day.~ Age, D,mean)
aggregate(Screen.On.Time..hours.day.~ Gender, D,mean)
aggregate(Number.of.Apps.Installed~Age, D,mean)
aggregate(Screen.On.Time..hours.day.~ Age, D,sum)
aggregate(Screen.On.Time..hours.day.~ Gender, D,sum)

# Plotting histograms for numerical variable

hist(D$Screen.On.Time..hours.day., main = "Screen Time",
      xlab = "screen time",
      col = "lightblue",
      border = "black")
hist(D$Age, main = "Age",
      xlab = "Age",
      col = "green",
      border = "black")
hist(D$Number.of.Apps.Installed, main = "No. of Apps",
       xlab = "No. of app installed",
       col = "lightcoral",
       border = "black")

# Boxplots to identify outliers in the numerical variables

boxplot(D$Age, main = "Boxplot of Age",
        ylab = "Age",
        col = "lightblue",horizontal = TRUE )

boxplot(D$Data.Usage..MB.day., main = "Boxplot of Battery Usage",
        ylab = "Battery Usage",
```

```
        col = "green", horizontal = TRUE)

boxplot(D$Screen.On.Time..hours.day.,main= " Boxplot of Screen Time",
        ylab = "Screen Time",
        col = "lightcoral", horizontal = TRUE)

boxplot(D$Number.of.Apps.Installed, main = "Boxplot of App Installed",
        ylab = "Apps",
        col = "pink", horizontal = TRUE)

install.packages("ggplot2")          #install the ggplot2 library for scatter plot
library(ggplot2)                     # Load the ggplot2 library
lengths(D)
D<-as.data.frame(D)
is.data.frame(D)                     #to check if D as a data frame

# Scatter plot of  Number of Apps Installed vs Battery Drain mAh day, colored by Age

ggplot(D, aes(x = Number.of.Apps.Installed, y = Battery.Drain..mAh.day., color = Age)) +
  geom_point(size = 2) +
  labs(title = "Scatter Plot of Number of Apps Installed vs Battery Drain mAh day",
       x = "Number of Apps Installed",
       y = "Battery Drain (mAh/day)") +
  theme_minimal()
```

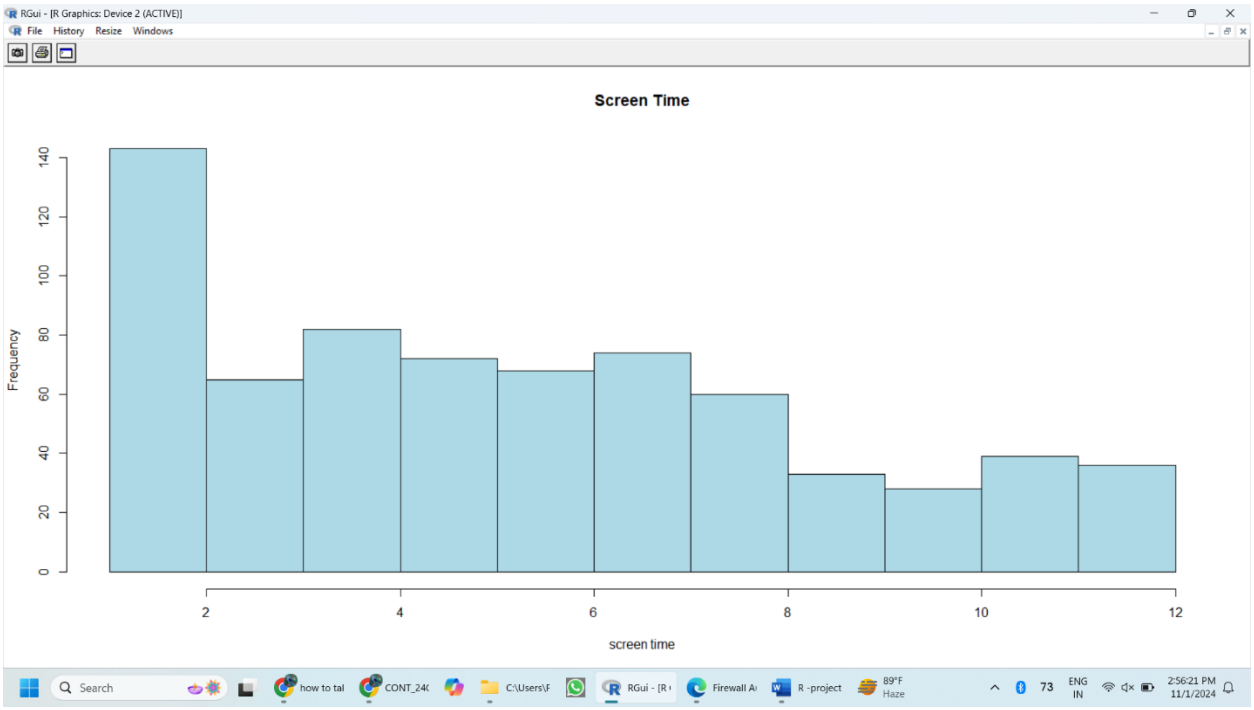
```
# Scatter plot of App Usage Time min day vs Number of Apps Installed, colored by Age

ggplot(D, aes(x = App.Usage.Time..min.day., y = Number.of.Apps.Installed, color = Age)) +
  geom_point(size = 2) +
  labs(title = "Scatter Plot  App Usage Time min day of vs Number of Apps Installed", x = " App Usage Time min day", y = "Number of Apps Installed") +
  theme_minimal()

#box plot: Number.of.Apps.Installed for different Gender

D <- boxplot( Number.of.Apps.Installed~ Gender,
              data=D,
              main="BOX-PLOT Graph",
              xlab="Age",
              ylab="Number of Apps Installed",
              col=c("lightblue", "purple", "lightgreen"),
              border="black",
              pch=16)
```

Outputs :


RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
Screen Time
Frequency
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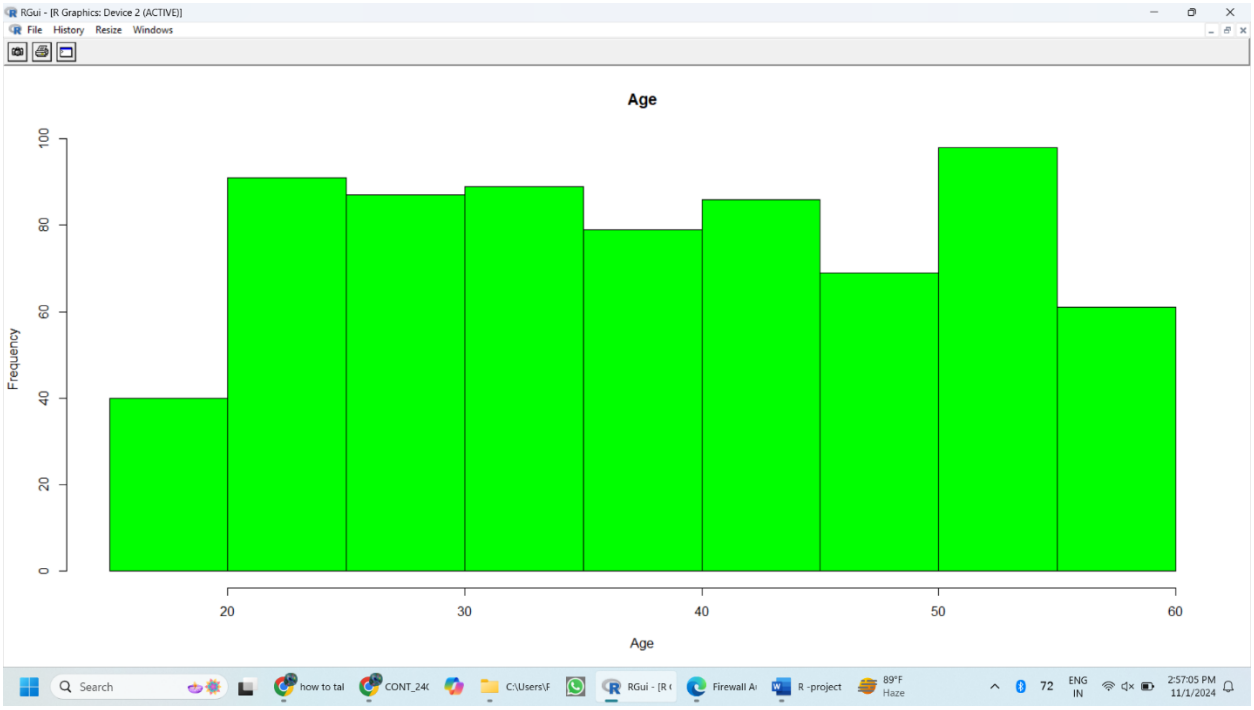
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
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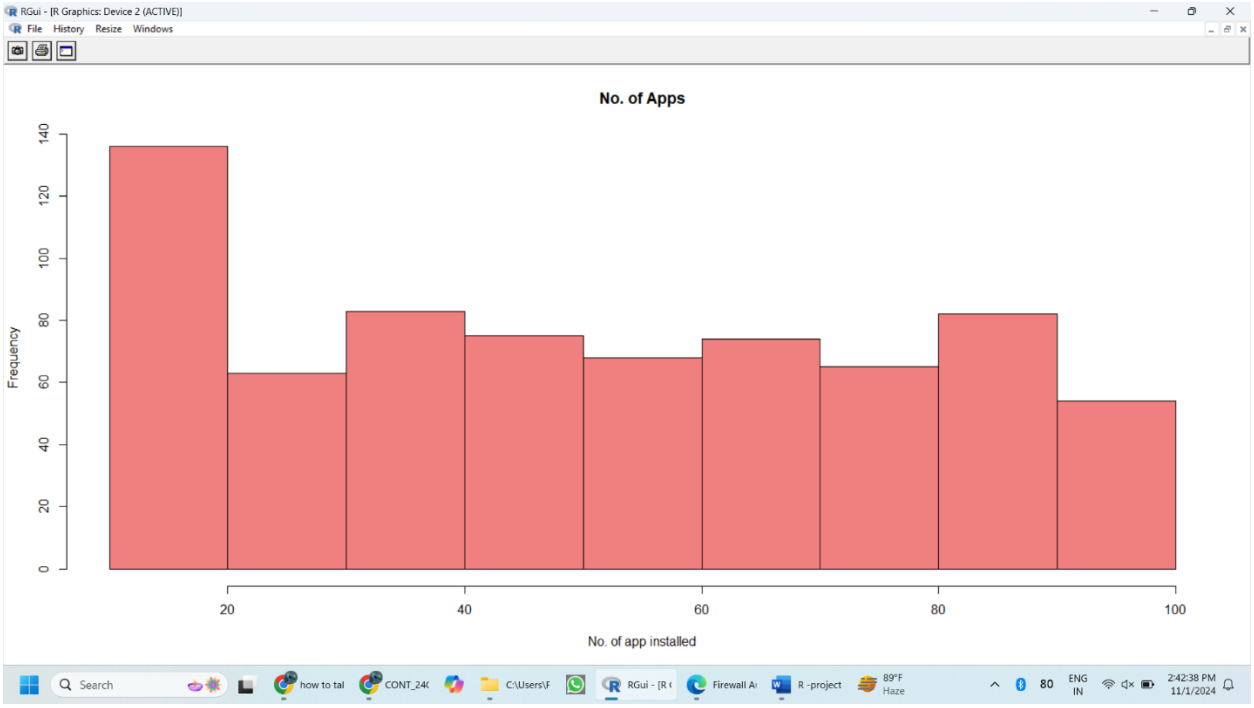
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
No. of Apps
Frequency
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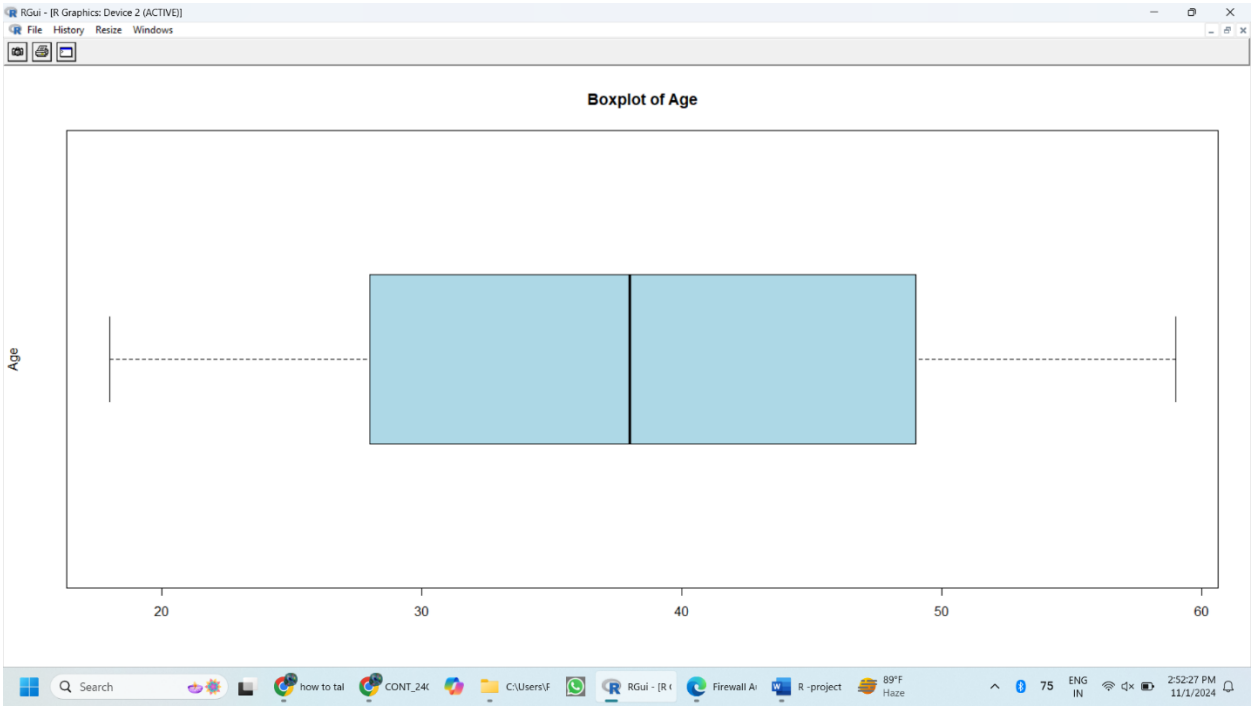
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
Boxplot of Age
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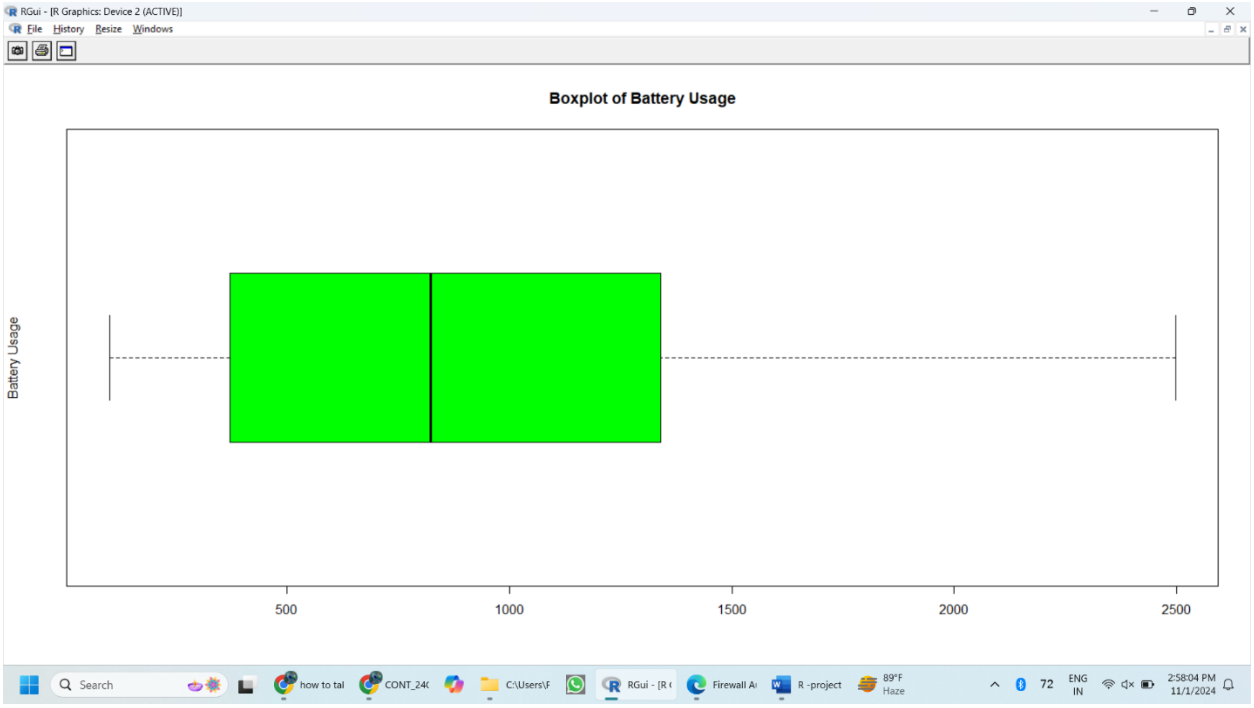
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
Boxplot of Battery Usage
Battery Usage
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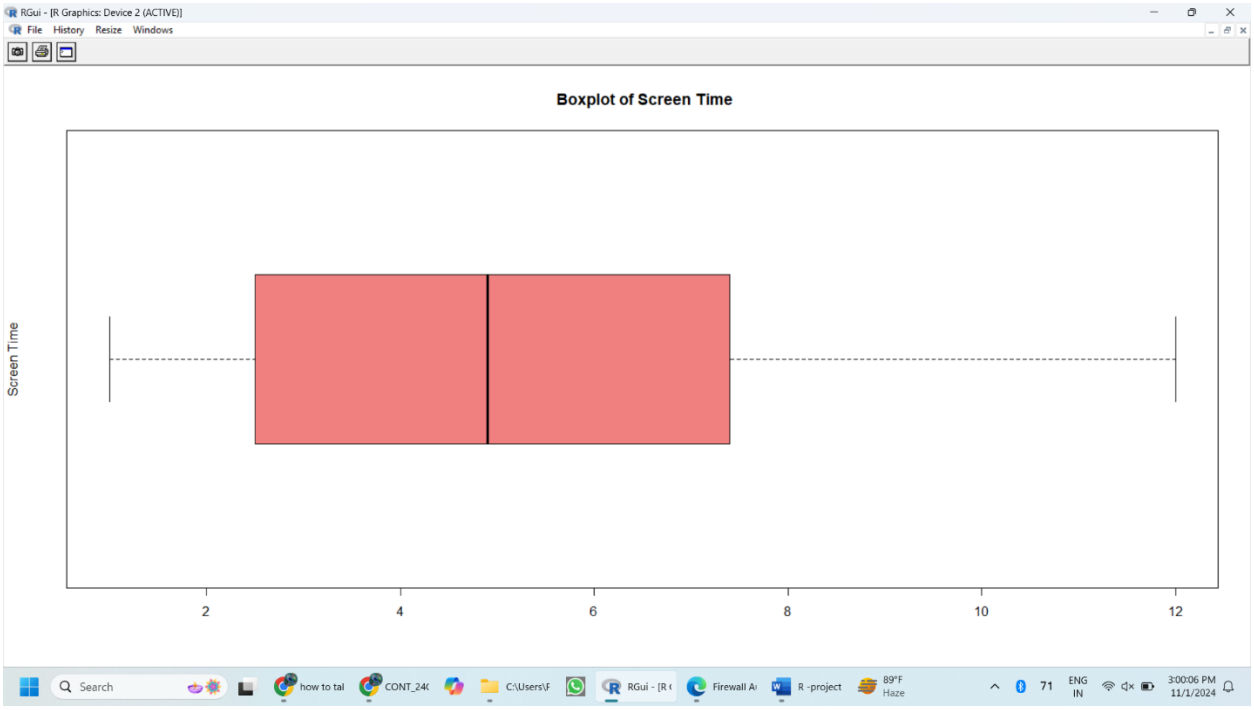
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
Boxplot of Screen Time
Screen Time
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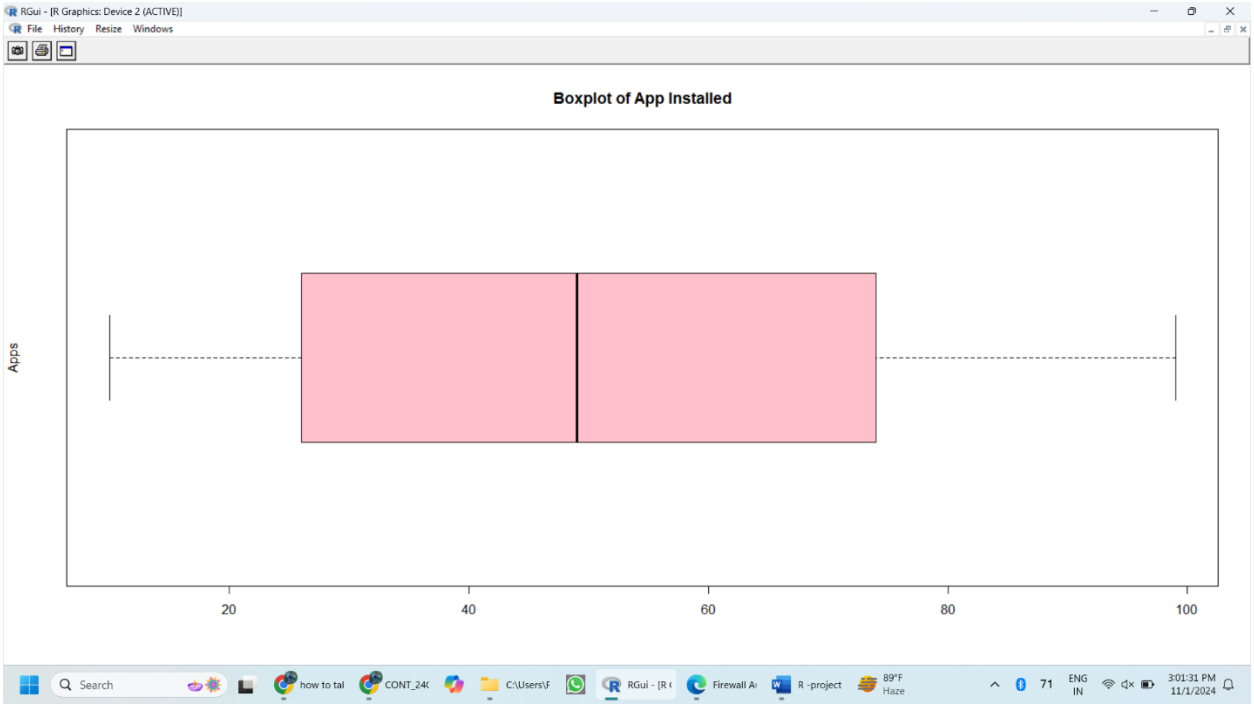
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
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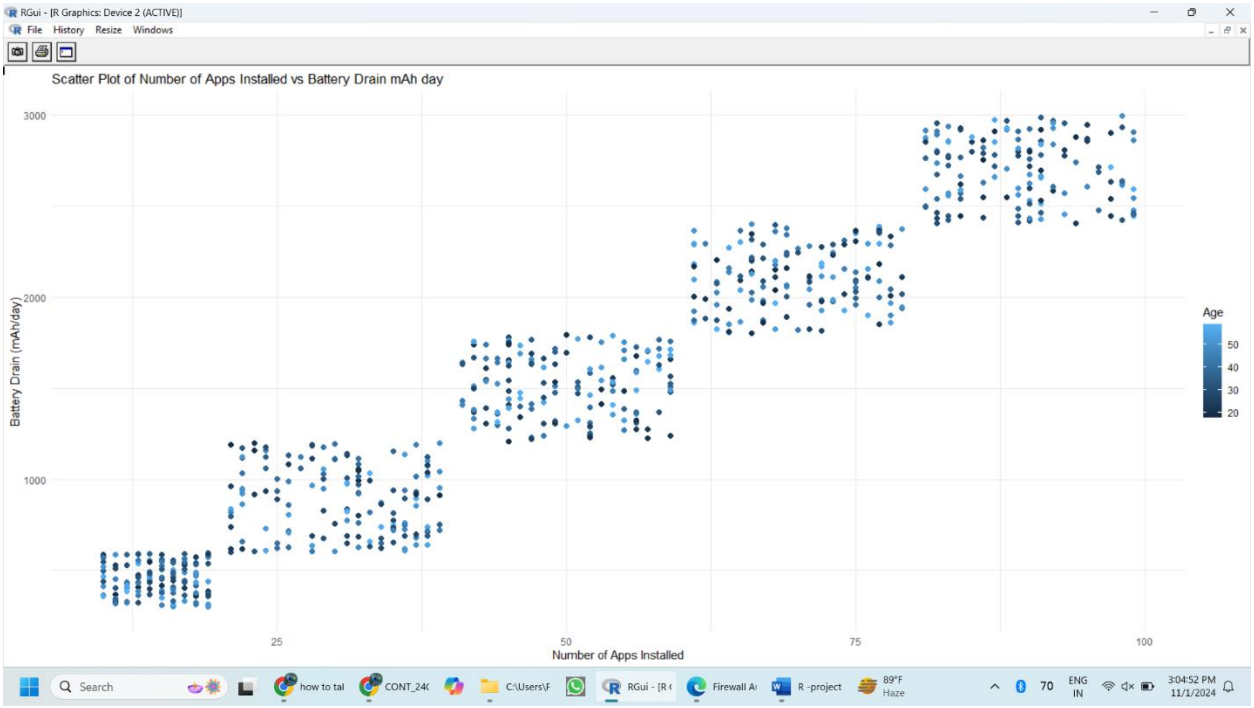
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
Scatter Plot of Number of Apps Installed vs Battery Drain mAh day
Battery Drain (mAh/day)
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Number of Apps Installed
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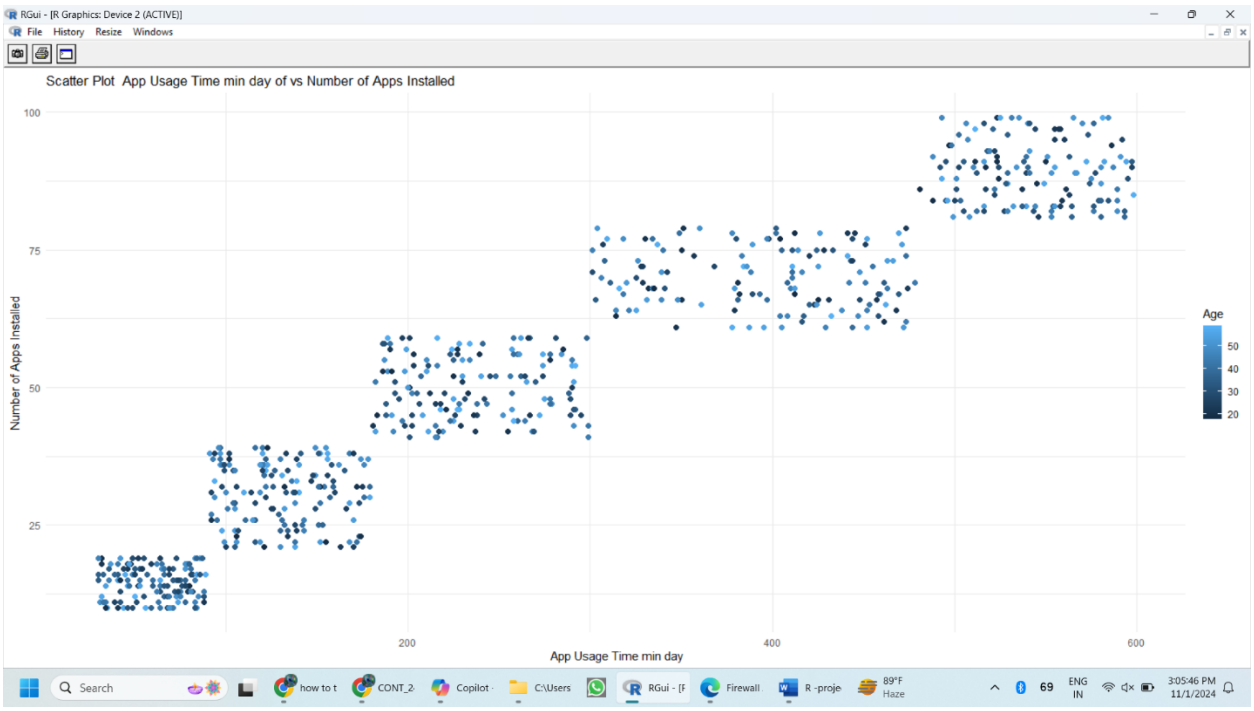
RGui - [R Graphics: Device 2 (ACTIVE)]
File History Resize Windows
Scatter Plot App Usage Time min day of vs Number of Apps Installed
Number of Apps Installed
App Usage Time min day
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