Project

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/*

Project: Data211

According to the "Alarming Average Screen Time Statistics (2024). The average American spend 7hours and 3 minutes looking at a screen each day. In this project I will be performing T-test to compare the average screen time with my daily usage of screen time.

*/

```r
library(tidyr)
```

```
## Warning: package 'tidyr' was built under R version 4.3.3
```

```r
library(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.3.3
```

```r
library(readxl)
```

```
## Warning: package 'readxl' was built under R version 4.3.3
```

```r
#Importing the data of 14days

screen_time <- c(
  8 + 35/60,   # Day 1
  6 + 49/60,   # Day 2
  11 + 40/60,  # Day 3
  9 + 20/60,   # Day 4
  7 + 2/60,    # Day 5
  6 + 11/60,   # Day 6
  10 + 54/60,  # Day 7
  6 + 4/60,    # Day 8
  8 + 24/60,   # Day 9
  7 + 7/60,    # Day 10
  7 + 17/60,   # Day 11
  8 + 28/60,   # Day 12
  8 + 54/60,   # Day 13
  7 + 41/60    # Day 14
)
```

```r
#Creating a data frame

days <- paste("Day", 1:14)

data <- data.frame(Day = days, ScreenTime_Hours = screen_time)

data
```

```
##       Day ScreenTime_Hours
## 1   Day 1         8.583333
## 2   Day 2         6.816667
## 3   Day 3        11.666667
## 4   Day 4         9.333333
## 5   Day 5         7.033333
## 6   Day 6         6.183333
## 7   Day 7        10.900000
## 8   Day 8         6.066667
## 9   Day 9         8.400000
## 10 Day 10         7.116667
## 11 Day 11         7.283333
## 12 Day 12         8.466667
## 13 Day 13         8.900000
## 14 Day 14         7.683333
```

#Step:3 Performing the Calculate Descriptive Statistics

```r
# Calculating the mean

mean_screen_time <- mean(screen_time)


# Calculating the Median

median_screen_time <- median(screen_time)

#Standard Deviation

std_screen_time<- sd(screen_time)


# Display the results
cat("Mean Screen Time:", round(mean_screen_time, 2), "hours\n")
```

```
## Mean Screen Time: 8.17 hours
```

```r
cat("Median Screen Time:", round(median_screen_time, 2), "hours\n")
```

```
## Median Screen Time: 8.04 hours
```

```r
cat("Standard Deviation:", round(std_screen_time, 2), "hours\n")
```

```
## Standard Deviation: 1.65 hours
```

#Step: 3

/*

Research Question:

Is my average daily Screen time significantly different from the average American's screen time of 7.05 hours"?

Null and Alternative Hypotheses:

~Null Hypothesis (H_0): The mean daily screen time is equal to 7.05 hours ($\mu = 7.05$)

~Alternative Hypothesis (H_1): The mean daily screen time is not equal to 7.05 hours ($\mu = 7.05$)

*/

##Step:4 / *Perform a Two-Tailed T-Test Since our sample size is small (n=14) a t-test is best* /

```r
# Perform the t-test
t_test <- t.test(screen_time, mu = 7.05, alternative = "two.sided")

# Display the t-test results
print(t_test)
```

```
##
##  One Sample t-test
##
## data:  screen_time
## t = 2.5444, df = 13, p-value = 0.02445
## alternative hypothesis: true mean is not equal to 7.05
## 95 percent confidence interval:
##  7.219625 9.127994
## sample estimates:
## mean of x
##   8.17381
```

/* The p-value(0.02445) is less than the significance level ($a = 0.05$)

Decision: Reject the null Hypothesis

There is statistically significant evidence to concluded that your average daily screen time is different from 7.05 hours */

##Step: 6 Visualize Your Data

```r
#a: Line Graph of Daily Screen Time

data$DayIndex<-1:14

ggplot(data, aes(x = DayIndex, y = ScreenTime_Hours, group =1))+
  geom_line(color="blue")+
  geom_point(color="blue")+
  geom_hline(yintercept = 7.05, linetype= "dashed", color ="red")+
   scale_x_continuous(breaks = 1:14, labels = paste("Day", 1:14)) +
  labs(title = "Daily Screen Time Over Two Weeks", x="Day", y ="Screen Time (Hours)")+
  theme_minimal()+
  theme(axis.text.x = element_text(angle =45, hjust=1))
```
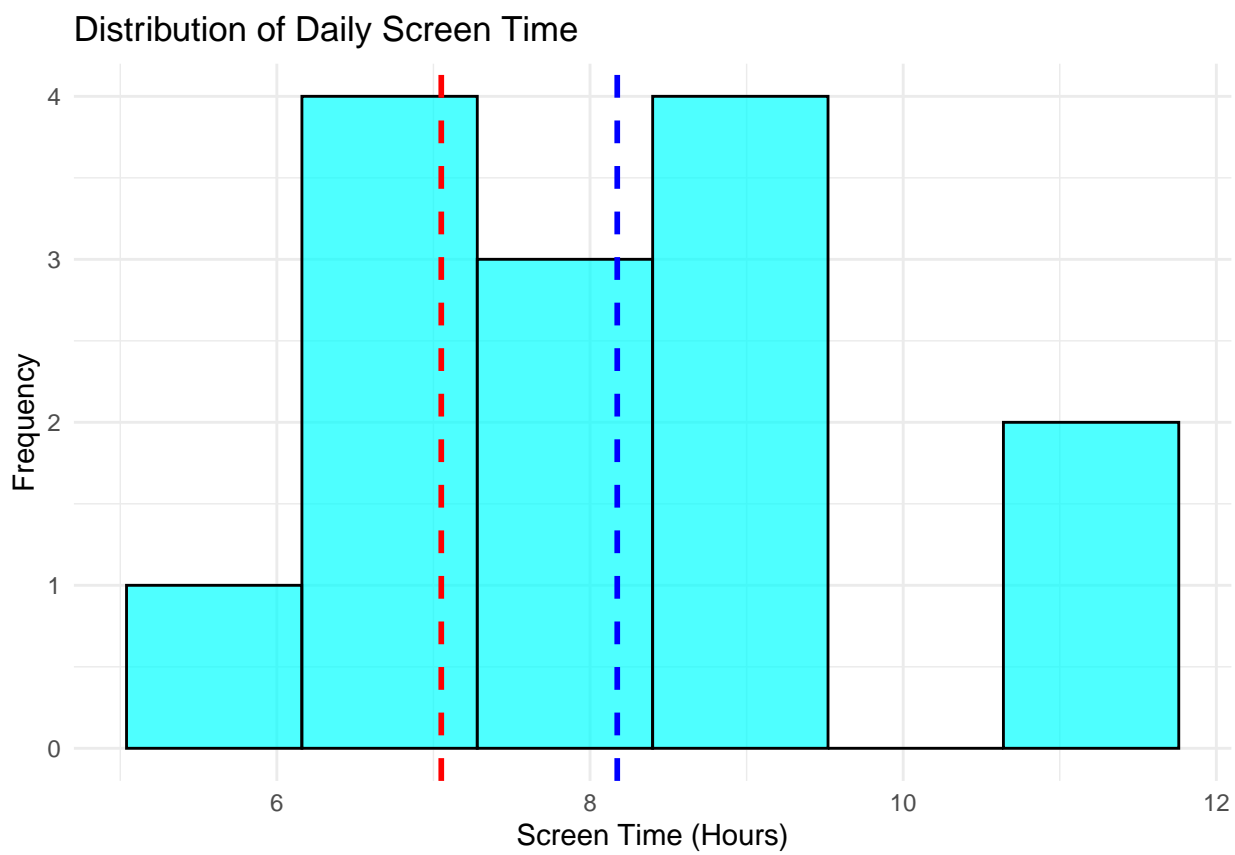
Daily Screen Time Over Two Weeks
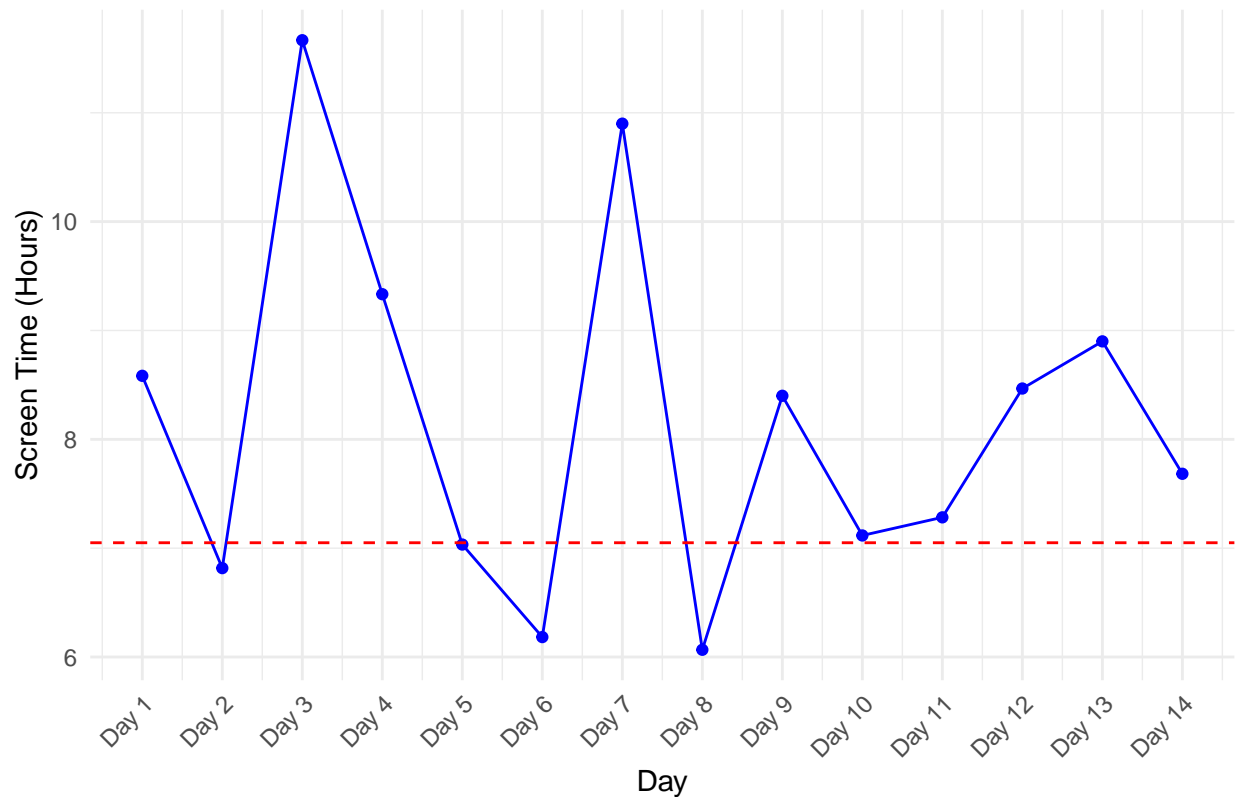
##b: Histogram of Screen Time Distribution

```r
# Histogram with updated `linewidth` argument
ggplot(data, aes(x = ScreenTime_Hours)) +
  geom_histogram(bins = 6, fill = "cyan", color = "black", alpha = 0.7) +
  geom_vline(xintercept = mean_screen_time, linetype = "dashed", color = "blue", linewidth = 1) +
  geom_vline(xintercept = 7.05, linetype = "dashed", color = "red", linewidth = 1) +
  labs(title = "Distribution of Daily Screen Time",
       x = "Screen Time (Hours)",
       y = "Frequency") +
  theme_minimal()
```

Distribution of Daily Screen Time

“‘