R Notebook

A Comparative Analysis of Wi-Fi Performance Between Science and Humanities Buildings: Evidence of Infrastructure Inequality on a College Campus

```r
# if not installed use: install.packages("package_name")
library(readxl)
library(psych)

hanson_data= read_excel("datasheet.xlsx", sheet="Hanson")
oldmain_data= read_excel("datasheet.xlsx", sheet="Old Main")
```

H_T: There is no difference in average wifi speed between Old Main and Hanson

H_A: There is a difference in average wifi speed between Old Main and Hanson

$\alpha = 0.05$

Abstract

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I. Introduction

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II. Experimental Setup

```r
# get the differece between download and upload speeds for each building
result <- data.frame(download_diff = hanson_data$`Download Speed (Mbps)` - oldmain_data$`Download Speed
                     upload_diff = hanson_data$`Upload Speed (Mbps)` - oldmain_data$`Upload Speed (Mbps)
```

Here is a summary of the data:

```r
summary(result$download_diff)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## -128.100   -5.525   30.460   22.832   58.157  139.520
```

```r
summary(result$upload_diff)
```

```
##     Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
## -157.000   -2.600   14.485    9.639   42.305  128.400
```

Now to get some of the statistics:

```r
download_sd <- sd(result$download_diff)
download_mean <- mean(result$download_diff)

upload_sd <- sd(result$upload_diff)
upload_mean <- mean(result$upload_diff)

#use ggplot2
library(ggplot2)
```

```
##
## Attaching package: 'ggplot2'

## The following objects are masked from 'package:psych':
##
##     %+%, alpha
```

```r
plot_dist_hist <- function(n,mean,sd,binwidth) {
  df <- data.frame(x = rnorm(n, mean, sd))
  ggplot(df, aes(x = x, mean = mean, sd = sd, binwidth = binwidth, n = n)) +
    theme_bw() +
    geom_histogram(binwidth = binwidth,
        colour = "white", fill = "cornflowerblue", linewidth = 0.1) +
stat_function(fun = function(x) dnorm(x, mean = mean, sd = sd) * n * binwidth,
    color = "darkred", linewidth = 1)
}
n = 16
binwidth = 50 # passed to geom_histogram and stat_function
set.seed(1)


plot_dist_hist(n, download_mean, download_sd, binwidth)
```
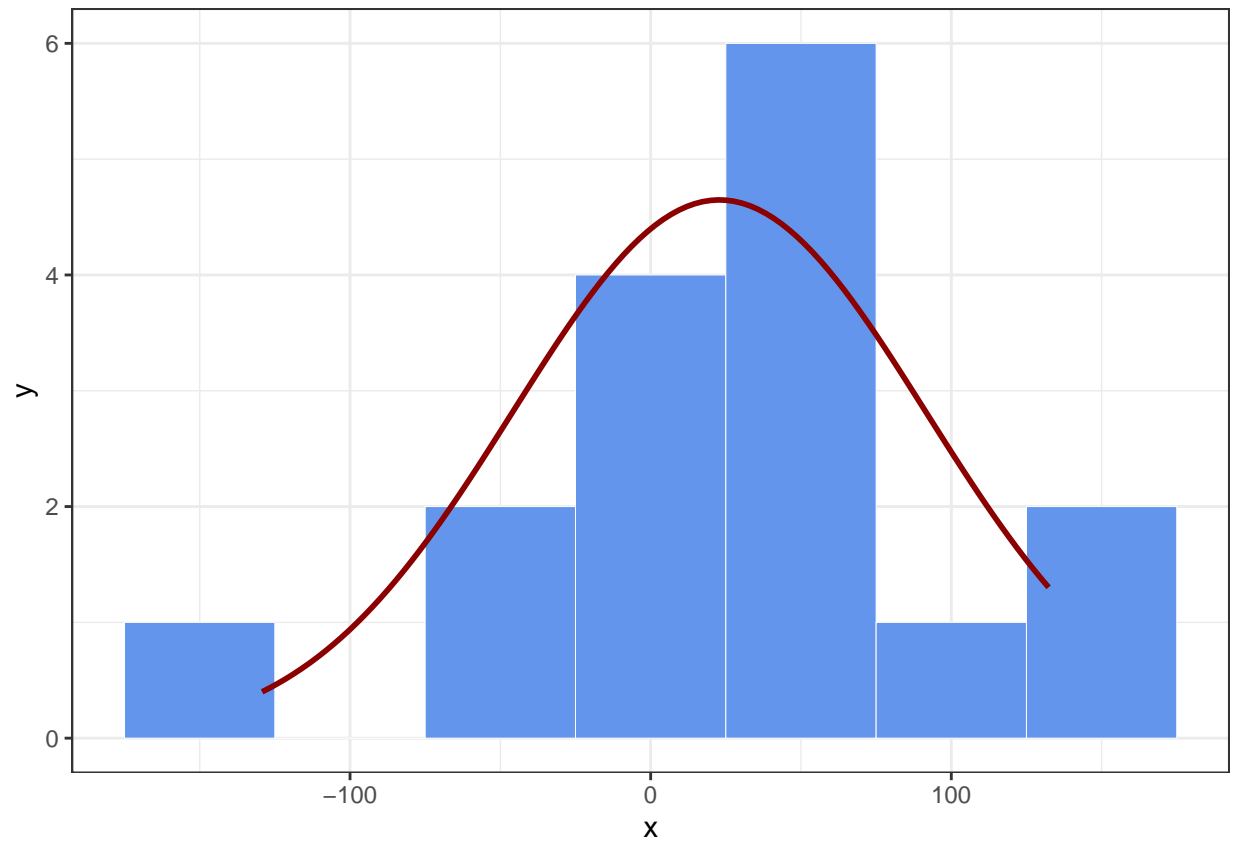
```r
plot_dist_hist(n, upload_mean, upload_sd, binwidth)
```
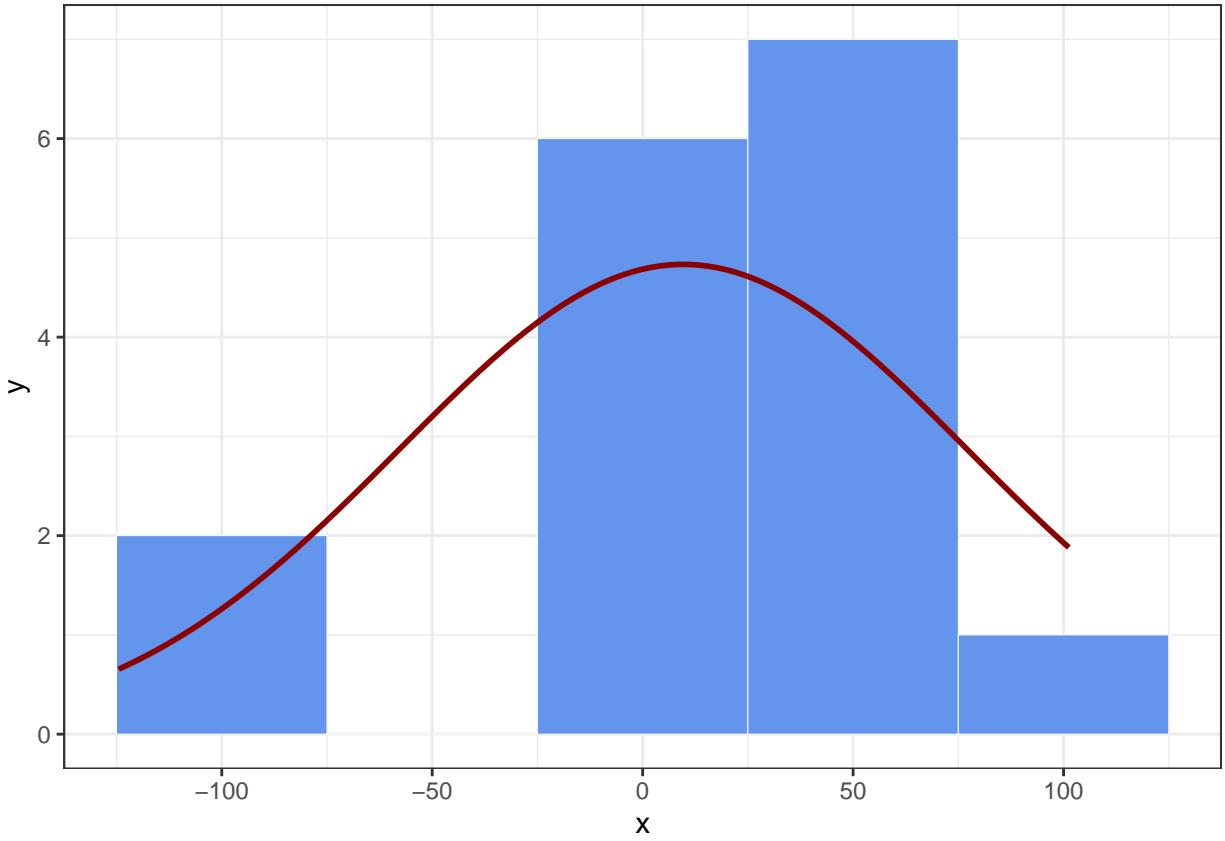
III. Results

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IV. Discussion

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References

Using IEEE Style