

q3

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```
directory <- "C:/Users/Aaron/OneDrive/Documents/TERM 3A/STAT 341/A1/data"
dirsep <- "/"
filename <- paste(directory, "Iris.csv", sep=dirsep)
data <- read.csv(filename, header=TRUE)

drawBoxPlot <- function(df) {
  # number of columns in the data frame

  m <- ncol(df)

  boxplot_stats <- sapply(df, function(x) boxplot.stats(x)$stats)

  # loop through each column and calculate the five-number summary
  plot(0,0, main = 'BoxPlot Function', xlab = 'Columns', ylab = 'Measurement (mm)', xlim = c(1,m+.5), ylim = c(0,10))
  axis(1, at = seq(1.5, m+0.5, 1), labels = colnames(df))
  for (i in 1:m) {

    col <- df[,i]
    stats <- boxplot_stats[,i]

    # extract the five-number summary
    min_val <- stats[1]
    max_val <- stats[5]
    medians <- stats[3]
    q1 <- stats[2]
    q3 <- stats[4]

    # calculate the inter-quartile range (IQR)
    IQR <- q3 - q1

    # calculate the lower/upper limits for the whiskers
    lower_limit <- q1 - 1.5 * IQR
    upper_limit <- q3 + 1.5 * IQR

    whisker_min <- min(col[col >= (lower_limit)])
    whisker_max <- max(col[col <= (upper_limit)])

    outliers <- col[(col < whisker_min) | (col > whisker_max)]

    # plot the boxplot
    rect(i + 0.25, q1, i+0.75, q3)
```

```

segments(i + 0.25, medians, i+0.75, medians, col = 'red')
segments(i + 0.25, whisker_max, i+0.75, whisker_max, col = 'red')
segments(i + 0.25, whisker_min, i+0.75, whisker_min, col = 'red')
points(rep(i + .5, length(outliers)),outliers)
}
}

drawBoxPlot(data[, c(1:4)])

```

## BoxPlot Function

