# COMPSCIX 415.2 Homework 5/Midterm

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## Contents



### Github location

My homework assignments can be found at https://github.com/santumagic/compscix-415-2assignments.git

### RStudio and R Markdown

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#### Question: 1

As part of this question, I have loaded the required packages and added instructions for table of contents etc in the YAML header.

```
# Load the required packages
library(tidyverse)
library(mdsr)
library(nycflights13)
```

## The tidyverse packages

- **Question: 1**

  Plotting - **ggplot2**
  Data munging/wrangling - **dplyr** and **tidyr**
  Reshaping (speading and gathering) data - **tidyr**
  Importing/exporting data - **readr**

- **Question: 2**

  Plotting - **ggplot()** and **aes()**
  Data munging/wrangling - **select()** and **filter()**
  Reshaping (speading and gathering) data - **separate()** and **extract()**
  Importing/exporting data - **read_csv()** and **read_delim()**

## R Basics

- **Question: 1**

```
My_data.name___is.too0OooLong <- c( 1 , 2 , 3 )
```

**Answer:** Just with one change (removal of '!'), the code works.

- **Question: 2**

```
# this is a charactor vector
my_string <- c('has', 'an', 'error', 'in', 'it')
my_string
```

```
## [1] "has"   "an"    "error" "in"    "it"
```

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**Question: 3**

```
my_vector <- c(1, 2, '3', '4', 5)
my_vector
```

```
## [1] "1" "2" "3" "4" "5"
```

**Answer:** This is a numeric vector and with or without the single or double quotes, vactor takes values.

## Data import/export

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**Question: 1**

```
# Download and import the file rail_trail.txt
rail_trail.txt <- read.delim("/Users/skanutal/Documents/Santosh/Learning/Berkeley/rail_trail.txt", sep=
#glimpse the data from txt file
glimpse(rail_trail.txt)
```

```
## Observations: 90
## Variables: 10
## $ hightemp   <int> 83, 73, 74, 95, 44, 69, 66, 66, 80, 79, 78, 65, 41,...
## $ lowtemp    <int> 50, 49, 52, 61, 52, 54, 39, 38, 55, 45, 55, 48, 49,...
## $ avgtemp    <dbl> 66.5, 61.0, 63.0, 78.0, 48.0, 61.5, 52.5, 52.0, 67....
## $ spring     <int> 0, 0, 1, 0, 1, 1, 1, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, ...
## $ summer     <int> 1, 1, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 1, ...
## $ fall       <int> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, ...
## $ cloudcover <dbl> 7.6, 6.3, 7.5, 2.6, 10.0, 6.6, 2.4, 0.0, 3.8, 4.1, ...
## $ precip     <dbl> 0.00, 0.29, 0.32, 0.00, 0.14, 0.02, 0.00, 0.00, 0.0...
## $ volume     <int> 501, 419, 397, 385, 200, 375, 417, 629, 533, 547, 4...
## $ weekday    <int> 1, 1, 1, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, ...
```

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**Question: 2**

```
# Export the .txt file as csv into a different location
rail_trail_csv <- write_delim(
  rail_trail.txt, delim = '|',path = "/Users/skanutal/Documents/Santosh/Learning/Berkeley/3. Intro to D
  )
# Load the newly created csv file
rail_trail_csv_final <- read.csv(
  "/Users/skanutal/Documents/Santosh/Learning/Berkeley/3. Intro to DS/Assignments/rail_trail.csv", sep=
  )
# glimpse the data from the final csv file
glimpse(rail_trail_csv_final)
```

```
## Observations: 90
## Variables: 10
## $ hightemp   <int> 83, 73, 74, 95, 44, 69, 66, 66, 80, 79, 78, 65, 41,...
## $ lowtemp    <int> 50, 49, 52, 61, 52, 54, 39, 38, 55, 45, 55, 48, 49,...
```

```
## $ avgtemp    <dbl> 66.5, 61.0, 63.0, 78.0, 48.0, 61.5, 52.5, 52.0, 67....
## $ spring     <int> 0, 0, 1, 0, 1, 1, 1, 1, 0, 0, 0, 1, 1, 0, 0, 1, 0, ...
## $ summer     <int> 1, 1, 0, 1, 0, 0, 0, 0, 1, 1, 1, 0, 0, 0, 0, 0, 1, ...
## $ fall       <int> 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, ...
## $ cloudcover <dbl> 7.6, 6.3, 7.5, 2.6, 10.0, 6.6, 2.4, 0.0, 3.8, 4.1, ...
## $ precip     <dbl> 0.00, 0.29, 0.32, 0.00, 0.14, 0.02, 0.00, 0.00, 0.0...
## $ volume     <int> 501, 419, 397, 385, 200, 375, 417, 629, 533, 547, 4...
## $ weekday    <int> 1, 1, 1, 0, 1, 1, 1, 0, 0, 1, 1, 1, 1, 1, 1, 1, 0, ...
```

## Visualization

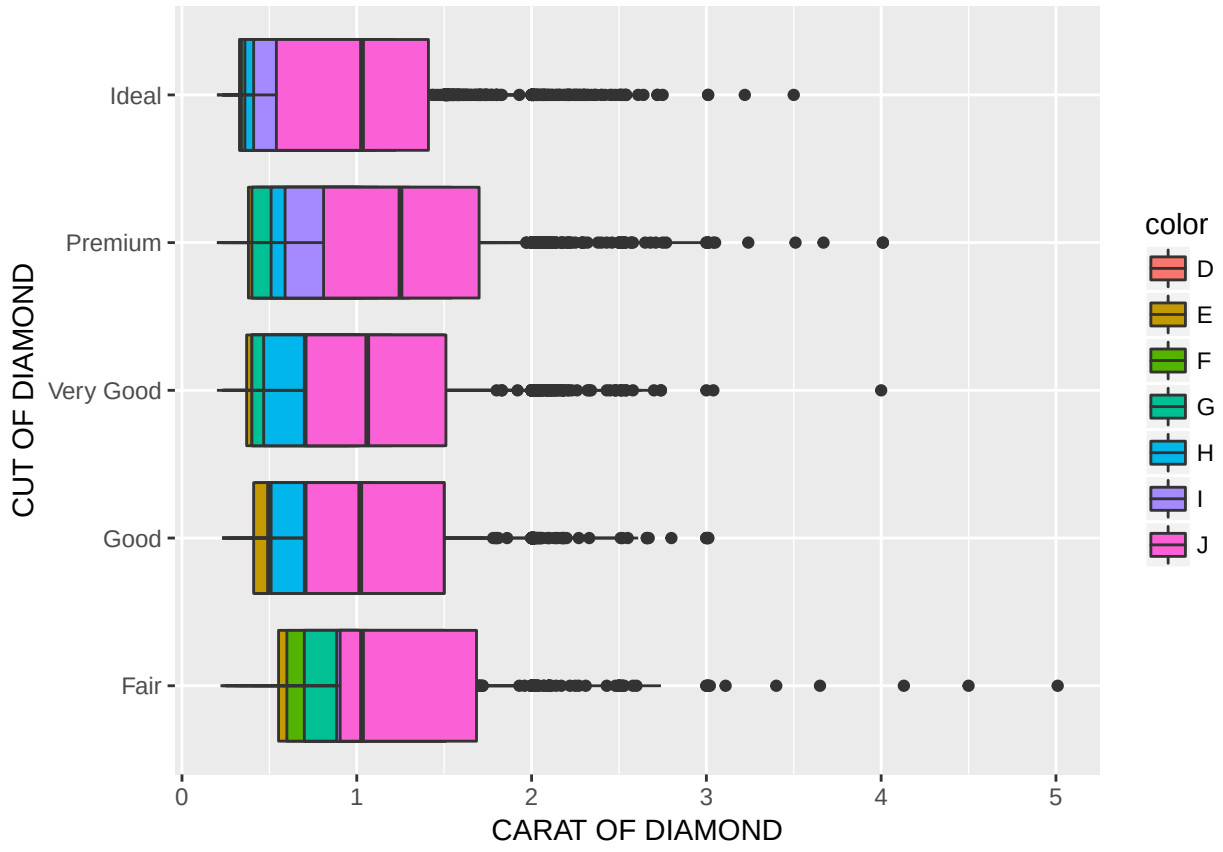
- **Question: 1**

  **Answer:**

1. Both the categories age group and gender are plotted on same axis, which is confusing at a first glanse.
2. There is no clear comparision visible between the age groups and with in the genders becase it shows the individual elemennts are compared against the responses only.
3. The graph elements are not sorted properly.

- **Question: 2**

```r
# Reproduce the given graph
ggplot(data = diamonds, mapping = aes(x = cut, y = carat, fill = color)) +
  geom_boxplot (position = "identity") +
  coord_flip() +
  labs(x = "CUT OF DIAMOND", y = "CARAT OF DIAMOND")
```

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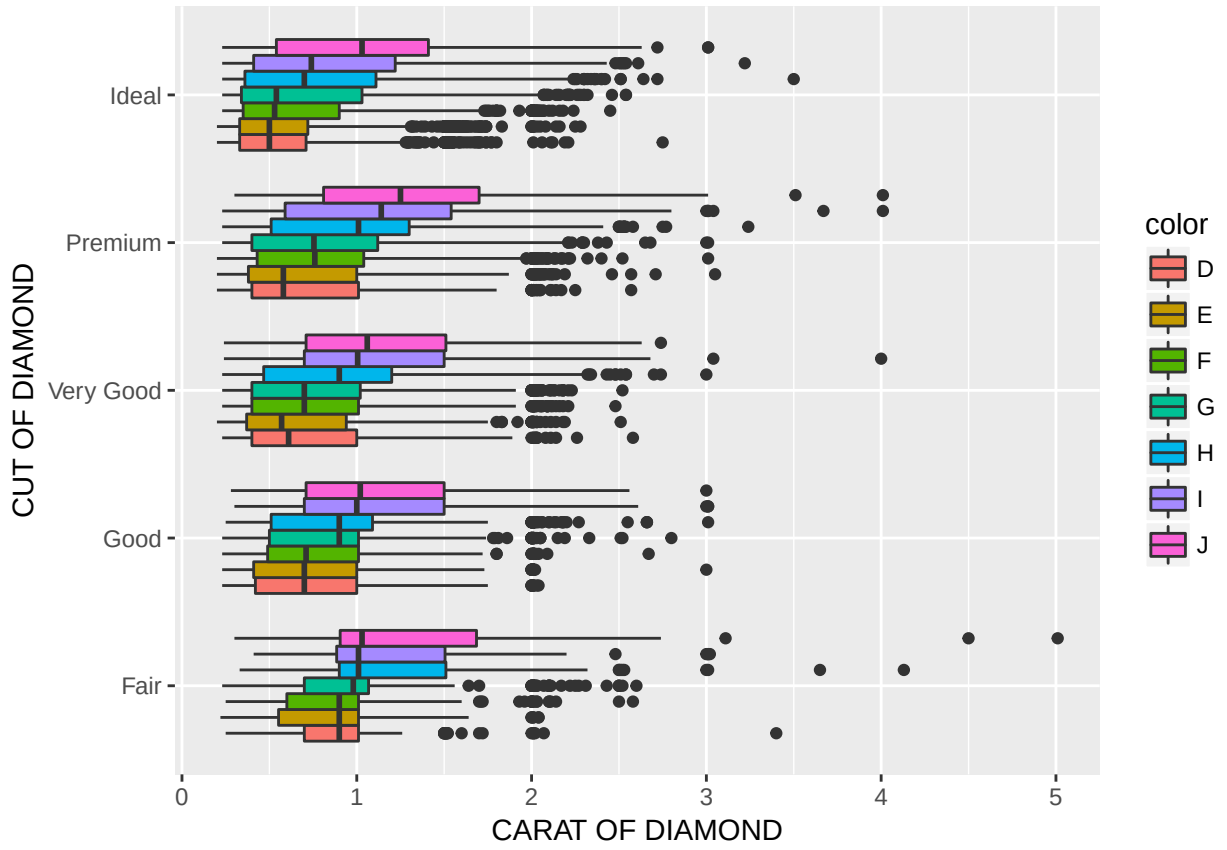
**Question: 3**

```
# Enhancing the graph by changing the position to "dodge"
ggplot(data = diamonds, mapping = aes(x = cut, y = carat, fill = color)) +
  geom_boxplot (position = "dodge") +
  coord_flip() +
  labs(x = "CUT OF DIAMOND", y = "CARAT OF DIAMOND")
```




**Explanation:** By using position = "dodge", we can compare the individual values side by side. ## Data munging and wrangling

**Question: 1**

**Question: 2**

**Question: 3**

## EDA

**Question: 1**

**Question: 2**

**Question: 3**

**Question: 4**

**Question: 5**

**Question: 6**

## Git and Github