DATA 101 Exam 1

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Due: Monday 10/26 at 11:59pm

Academic Honesty Statement (fill in your name)

I, Kamila Palys, hereby affirm that I have not communicated with or gained information in any way from my classmates or anyone other than the Professor during this exam, that I have not assisted anyone else with this exam, and that all work is my own.

Load packages and data

Questions

Question 1

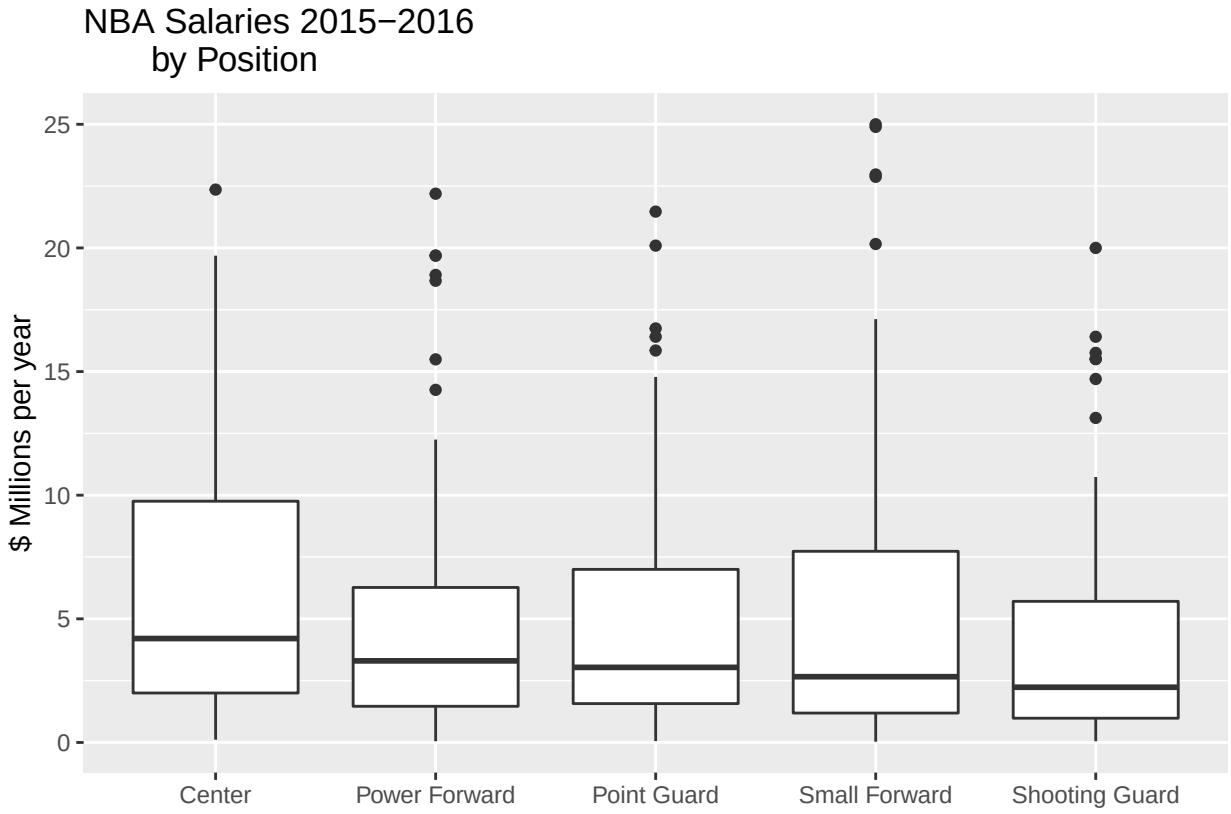
First, we will make a table to view the salaries of the NBA players in descending order by using the "select" and "arrange" functions to display the variables we want, in the order we want.

```
## # A tibble: 417 x 2
##    player          salary
##    <chr>            <dbl>
##  1 Kobe Bryant       25
##  2 Joe Johnson       24.9
##  3 LeBron James      23.0
##  4 Carmelo Anthony   22.9
##  5 Dwight Howard     22.4
##  6 Chris Bosh        22.2
##  7 Chris Paul        21.5
##  8 Kevin Durant      20.2
##  9 Derrick Rose      20.1
## 10 Dwyane Wade       20
## # ... with 407 more rows
```

From the table it is visible that Kobe Bryant has the highest salary of all the NBA players at $25 million.

Question 2

Now we will create a boxplot that compares the distribution of the players' salaries by position.

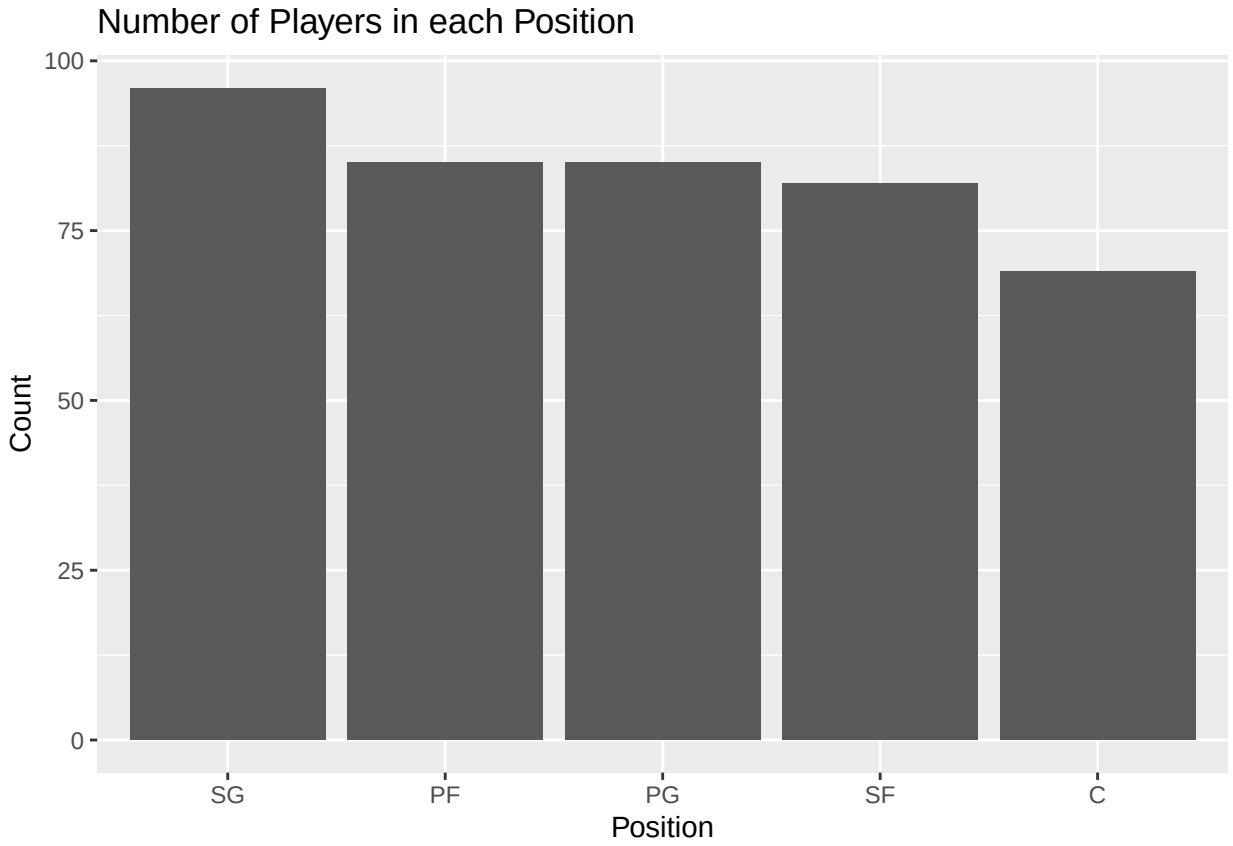


From this graph, we are able to see that the highest median salary is earned by players with the center position, while the lowest median comes from the shooting guard players. The ones who play center, however, also have a more even spread of their salaries, seeing as their interquartile range, or the middle 50%, is the largest of all the positions. There are also very little outliers in the center players' salaries, and there are several high outliers in all four of the other positions, so that is not to say that players playing a position other than center cannot earn a high salary.

Question 3

Now we will take a look at how many players there are in each position with "group_by" and the "count" function.

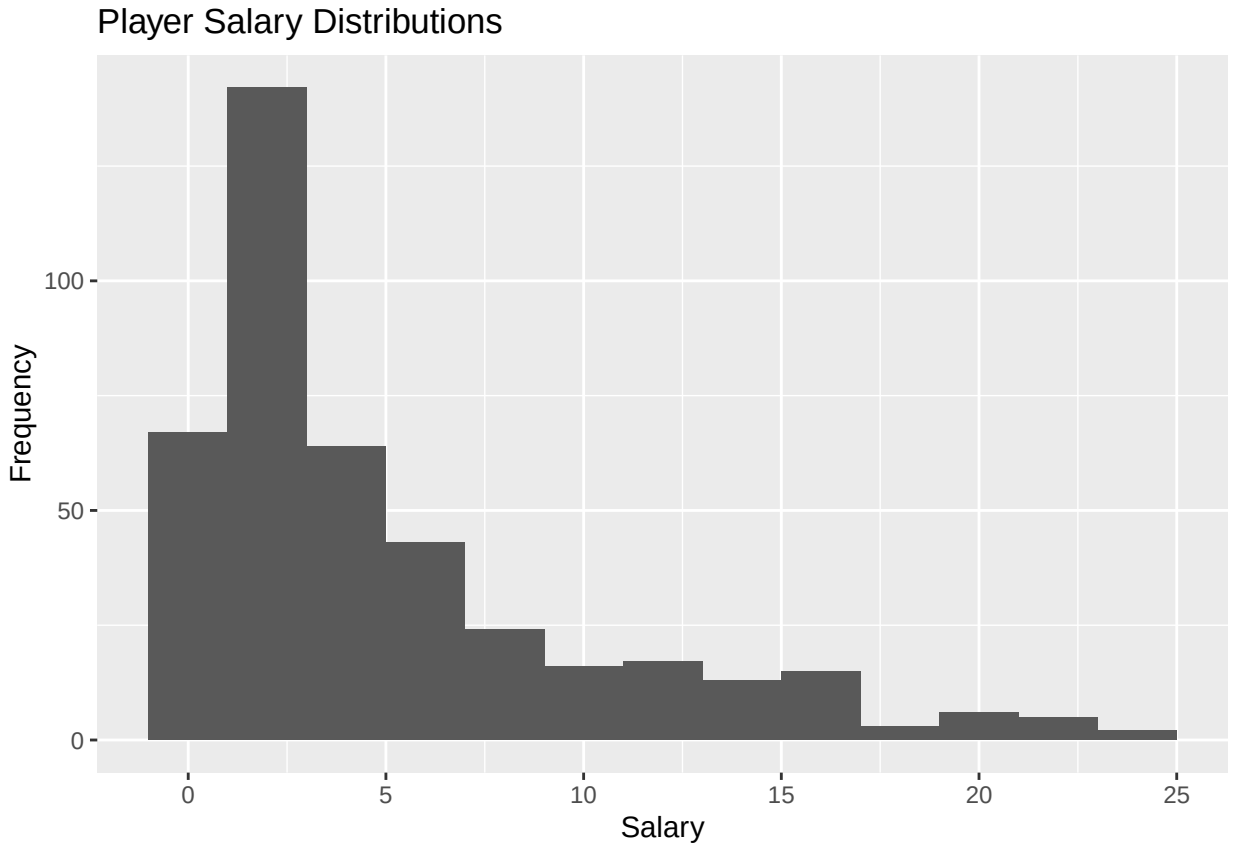
```
## # A tibble: 5 x 2
## # Groups:   position [5]
##   position     n
##   <chr>    <int>
## 1 SG          96
## 2 SF          82
## 3 PG          85
## 4 PF          85
## 5 C           69
```



With this table and bar graph, it is visible that there are the most players in shooting guard at 96, while the center position has only 69, which is the least amount of players playing a certain position. Additionally, there are 82 playing small forward, 85 playing point guard, and 85 playing power forward.

Question 4

Here a display is created in the form of a histogram to show the distribution of the salaries of the NBA players.



It is clear from this graph that a large number of players earned a salary between about $1 million to $3 million. It appears as though a large amount of players received a salary of up to $10 million, but a minority of them receive more than that and very few reach $20 million or more.

Question 5

Here, the average salaries per player in each team will be displayed.

```
## `summarise()` ungrouping output (override with `.groups` argument)
```

```
## Selecting by avg_salary
```

```
## # A tibble: 10 x 2
##    team                  avg_salary
##    <chr>                      <dbl>
##  1 Cleveland Cavaliers        10.2
##  2 Houston Rockets             7.11
##  3 Miami Heat                  6.79
##  4 Golden State Warriors       6.72
##  5 Chicago Bulls               6.57
##  6 San Antonio Spurs           6.51
##  7 Los Angeles Lakers          6.24
##  8 Sacramento Kings            6.22
##  9 Oklahoma City Thunder       6.05
## 10 Dallas Mavericks            5.98
```

As seen, the three top earning teams are the Cleveland Caveliers earning $10.2 million on average, Houston Rockets earning $7.11 million on average, and Miami heat with $6.79 million on average. The second and

third highest earning teams do not have an extreme difference in average salaries per player, but the Cleveland Caveliers have a high jump, with each player earning almost $3 million more on average than the second highest earning team. It is possible that this may be due to the Cleveland Caveliers having more famous basketball players that earn a salary that is considered to be an outlier.

Question 6

```
## # A tibble: 417 x 5
##    player           position team          salary salary_level
##    <chr>            <chr>    <chr>          <dbl> <chr>
##  1 Paul Millsap     PF       Atlanta Hawks  18.7  High
##  2 Al Horford       C        Atlanta Hawks  12    Moderate
##  3 Tiago Splitter   C        Atlanta Hawks   9.76 Moderate
##  4 Jeff Teague      PG       Atlanta Hawks   8    Moderate
##  5 Kyle Korver      SG       Atlanta Hawks   5.75 Low
##  6 Thabo Sefolosha  SF       Atlanta Hawks   4    Low
##  7 Mike Scott       PF       Atlanta Hawks   3.33 Low
##  8 Kent Bazemore    SF       Atlanta Hawks   2    Low
##  9 Dennis Schroder  PG       Atlanta Hawks   1.76 Low
## 10 Tim Hardaway Jr. SG       Atlanta Hawks   1.30 Low
## # ... with 407 more rows
```

Question 7

The following table will show the highest salary earned for each position in each team.

```
## `summarise()` regrouping output by 'team' (override with `.groups` argument)
```

```
## # A tibble: 147 x 3
## # Groups:   team [30]
##    team           position highest_salary
##    <chr>          <chr>             <dbl>
##  1 Atlanta Hawks  C                 12
##  2 Atlanta Hawks  PF                18.7
##  3 Atlanta Hawks  PG                 8
##  4 Atlanta Hawks  SF                 4
##  5 Atlanta Hawks  SG                 5.75
##  6 Boston Celtics C                  2.62
##  7 Boston Celtics PF                 5
##  8 Boston Celtics PG                 7.73
##  9 Boston Celtics SF                 6.80
## 10 Boston Celtics SG                 3.43
## # ... with 137 more rows
```

I started this problem by creating a new datafram with the new name and piping the nba dataset into the following functions. At first I started to use the select() function knowing that we would only display certain variables, but I later realized it was unnecessary. Since we are applying the maximum function in summarise to each position in each time, I grouped by the team and position. This gave me the new column that we needed, which I called highest_salary. I had to use the print() function so that the table would actually display.

Question 8

Now, the names will be shown for each player that corresponds to the highest earning salary for each position in each team.

```
## # A tibble: 218 x 6
##    team.x      position.x highest_salary player        position.y team.y
##    <chr>       <chr>               <dbl> <chr>         <chr>      <chr>
##  1 Atlanta Ha~ C                    12   Al Horford    C          Atlanta Hawks
##  2 Atlanta Ha~ C                    12   Kemba Walker  PG         Charlotte Hor~
##  3 Atlanta Ha~ C                    12   Kyle Lowry    PG         Toronto Rapto~
##  4 Atlanta Ha~ PF                   18.7 Paul Millsap  PF         Atlanta Hawks
##  5 Atlanta Ha~ PG                    8   Jeff Teague   PG         Atlanta Hawks
##  6 Atlanta Ha~ PG                    8   O.J. Mayo     SG         Milwaukee Buc~
##  7 Atlanta Ha~ PG                    8   Arron Afflalo SG         New York Knic~
##  8 Atlanta Ha~ PG                    8   Markieff Mor~ PF         Washington Wi~
##  9 Atlanta Ha~ SF                    4   Thabo Sefolo~ SF         Atlanta Hawks
## 10 Atlanta Ha~ SF                    4   Jordan Hill   C          Indiana Pacers
## # ... with 208 more rows
```

I approached this problem by thinking that I wanted to keep all data from the starters dataframe, and only add the players' names that corresponded to the highest salary. Therefore, I used a left_join to only add correspondin information from the nba data. I received many errors about the variable that I wanted to join by not existing, until I realized I needed to note that the "highest_salary" in the starters dataframe contains the same information as the "salary" in the nba dataframe.

Question 9

[Enter code and narrative here.]

Question 10

[Enter code and narrative here.]