**The NBA Draft**

Each year, the National Basketball Association (NBA) holds a draft, where prospective basketball players are able to be chosen to join one of the 30 professional teams across the United States and Canada.

In order to be eligible for the draft, a player must be at least 19 years old and out of high school for at least one year. Prior to 2006, this rule was not in effect, and players could be drafted during/right out of high school.

The draft is comprised of 60 players and takes place over two rounds of 30 selections. Teams pick players in an order based on performance from the previous season, with teams that performed poorly getting earlier picks in order to create a seemingly more level playing field.

**Playing Basketball**

The goal in basketball is to score as many points as possible by throwing the ball through the other team's hoop. The two netted baskets, positioned on opposite ends of a rectangular court, are normally 10 feet high, and have a backboard behind them.

In the middle of the court there is a half-court line that divides the two sides. On both sides, surrounding the hoops, there is an arch called the three-point line. Within the three-point line stands the free-throw line, where a player would shoot from should there be a foul called.

During play, each team has five players on the court. The game starts with the referee tossing the ball in the air in between a player from each team, while each player tries to swat the ball to a member of their team (called a jump ball).

**Scoring**

Players can shoot towards the hoop from any point on the court. A different number of points is rewarded based on where the player is standing when they release the ball. The three shots are explained below.

- Field Goal: Worth 2 points, scored by shooting within the three-point line

- Three Pointer: Worth 3 points, scored by shooting outside the three-point line.

- Free Throw: Worth one point, taken from the free throw line after a foul.

Players move the ball up and down the court by dribbling, passing the ball to teammates, or shooting the ball. At the end of the game, which is played in four twelve-minute quarters, the team with the most points win.

A diagram of a pick in a draft pick

Description automatically generatedThe graphs below show a density plot corresponding to the minutes per game based on players who were selected in Round 1 of the NBA draft. The dashed line represents the groups mean. The box plots represent the variance for the minutes played for players who were selected in the first round.

A graph of a diagram

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1. Based on this density plot and the box plots above, do you feel as though ANOVA is appropriate? What conclusions can you draw upon first glance of the two data visualizations? Are there any concerns?
2. Now that we've determined ANOVA is most likely appropriate, write and interpret in context the null and alternative hypotheses we'll be using for the ANOVA test.
3. A screenshot of a white and black text

   Description automatically generated Using the statistics for each category provided below, fill in the ANOVA table and use it to answer the following questions.

K = number of groups

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Source** | **DF** | **SS** | **MS** | **F** | **P** |
| Pick in Draft |  | 13839 |  |  | 2x10^-16 |
| Error |  |  |  |
| Total |  | 60091 |

1. Can we conclude there is a difference in the mean number of minutes played per game based on when a player was selected in the draft?
2. Using the ANOVA table, interpret the sum of squares for the groups. What does it imply about the data?
3. Between which groups are we *most likely* to see a significant difference. Between which groups are we *least likely* to see a significant difference in minutes played. Provide evidence.