Task 1 VerveBridge

Project Overview:

NBA Draft Combine Data Analysis (2009-2017)

This project involves a comprehensive analysis of NBA Draft Combine data from 2009 to 2017, focusing on the physical attributes and performance metrics of draft prospects. The primary goal is to uncover key trends, relationships, and factors that influence the draft position of players.

Key Metrics:

- Draft Pick
- Height (No shoes)
- Height (With Shoes)
- Wingspan
- Standing Reach
- Weight
- Vertical (Max)
- Body Fat
- Agility
- Sprint

Insights:

1) Correlation Heatmap

Draft Pick Correlations:

- **Height (No Shoes) and Height (With Shoes):** Both show a slight negative correlation with draft pick (-0.14 and -0.16 respectively). This suggests that taller players tend to be drafted earlier, although the correlation is relatively weak.
- **Wingspan (-0.16) and Standing Reach (-0.16):** Both are negatively correlated with draft pick, indicating that players with longer wingspans and higher standing reaches tend to be selected earlier.
- **Vertical Jump (Max and No Step):** These have weak to moderate negative correlations with draft pick (-0.16 and -0.12), implying that players with better vertical jumps may be slightly more favored in drafts.

Strongest Attribute Correlations:

- **Height and Wingspan/Standing Reach:** Strong positive correlations, indicating that taller players generally have longer wingspans and higher standing reaches.
- **Vertical Jump (Max and No Step):** Highly correlated, reflecting similar measures of leaping ability.

Year Correlations:

- **Year and Draft Pick:** A slight positive correlation (0.12) indicates that draft picks may have become more competitive over the years, with higher draft picks becoming slightly more common.

These correlations highlight trends in how physical attributes may influence draft outcomes, though other factors are also important.

2) Trend Analysis Over Time

Consistency Over Time:

Both selected and non-selected players show consistency in their physical attributes over the years, though selected players consistently outperform in key areas.

Importance of Physical Presence:

The combination of height, reach, and weight seems to play a significant role in draft outcomes, with selected players typically having an edge in these areas.

2010 as a Notable Year:

In 2010, there was a noticeable peak in key physical attributes such as height, wingspan, and weight among selected players, suggesting that this year may have featured a draft class with particularly standout physical characteristics. This highlights that 2010 was a year where standout physical traits likely played a more prominent role in the selection process, making it a notable year for draft outcomes.

Comparison Between Selected and Non-Selected Players:

- Selected players generally have a **height and reach** advantage over non-selected players, with consistently higher averages in height, wingspan, and standing reach. This suggests that size is a key factor in draft selections.
- **Agility and sprint times** are better (faster) for selected players, reinforcing the importance of speed and quickness in the selection process. Non-selected players, although consistent, fall slightly short in these areas, which may contribute to their not being picked.
- Selected players tend to be **heavier on average,** which could indicate a preference for players who have the physicality to withstand the rigors of professional play.
- **Vertical reach,** both max and no step, is higher on average for selected players, highlighting the importance of explosive athleticism in the draft.

3) Meaningful Relationships between Attributes (Regression Plot)

Height (With Shoes) & Wingspan vs. Draft Pick

- **Slight Positive Correlation:** Taller players and those with longer wingspans tend to be picked earlier, indicating that size is a valued attribute in draft selections.

Vertical Jump vs. Draft Pick

- **Weak Positive Correlation:** A higher vertical jump slightly correlates with earlier draft picks, but this attribute shows more variability and is less critical compared to height and wingspan.

Agility & Sprint vs. Draft Pick

- **Negative Correlation:** Better agility and faster sprint times are associated with earlier draft picks, emphasizing the importance of speed and quickness in selection decisions.

Body Fat Percentage vs. Draft Pick

- **Minimal Correlation:** Body fat percentage shows little to no impact on draft position, suggesting it's not a significant factor in the selection process.

4) Pair Plot of Draft Pick vs. Multiple Attributes

The pair plot displays the relationships between multiple attributes of draft picks (e.g., Height, Wingspan, Vertical, Weight, Agility, Sprint, Body Fat) and how they correlate with each other as well as with the draft pick number (encoded by color).

Draft Pick Correlations:

- The draft pick numbers (represented by different shades of blue) are fairly evenly spread across the physical attributes.
- Higher draft picks (lower numbers, indicated by darker blue dots) do not show a strong tendency to cluster towards higher values of Height, Weight, Wingspan, etc. Instead, they are spread across the range of values, suggesting that while physical attributes are important, they are not the sole determinants of draft position.

Correlation Between Physical Attributes:

- There is a strong positive correlation between attributes such as Height, Wingspan, Vertical, and Weight. Taller players tend to have longer wingspans, higher vertical jumps, and greater weight.
- Agility and Sprint also show a moderate positive correlation, indicating that players with better agility generally have faster sprint times.

Distribution Patterns:

- The diagonal plots represent the distribution of each attribute. Most attributes, such as Height, Weight, and Wingspan, have a normal distribution with some skewness.
- Body Fat has a different distribution pattern with a sharp peak at lower values, indicating that most players have low body fat percentages.

Overall, the plot suggests that physical attributes play a significant role in determining draft picks, with better physical metrics being associated with higher draft positions

Final Thoughts:

The analysis underscores the complexity of the NBA draft process. While physical metrics are undeniably important, they are only part of the equation. NBA teams likely consider a blend of physical, mental, and situational factors when making draft decisions. This multidimensional approach allows teams to identify prospects who might have the best long-term potential, even if they do not have the most impressive physical stats. Therefore, success in the draft seems to hinge on a holistic evaluation rather than just focusing on physical attributes alone. Over the years, the trend shows a consistent preference for these attributes, with peaks in physical traits during certain years, particularly for selected players.