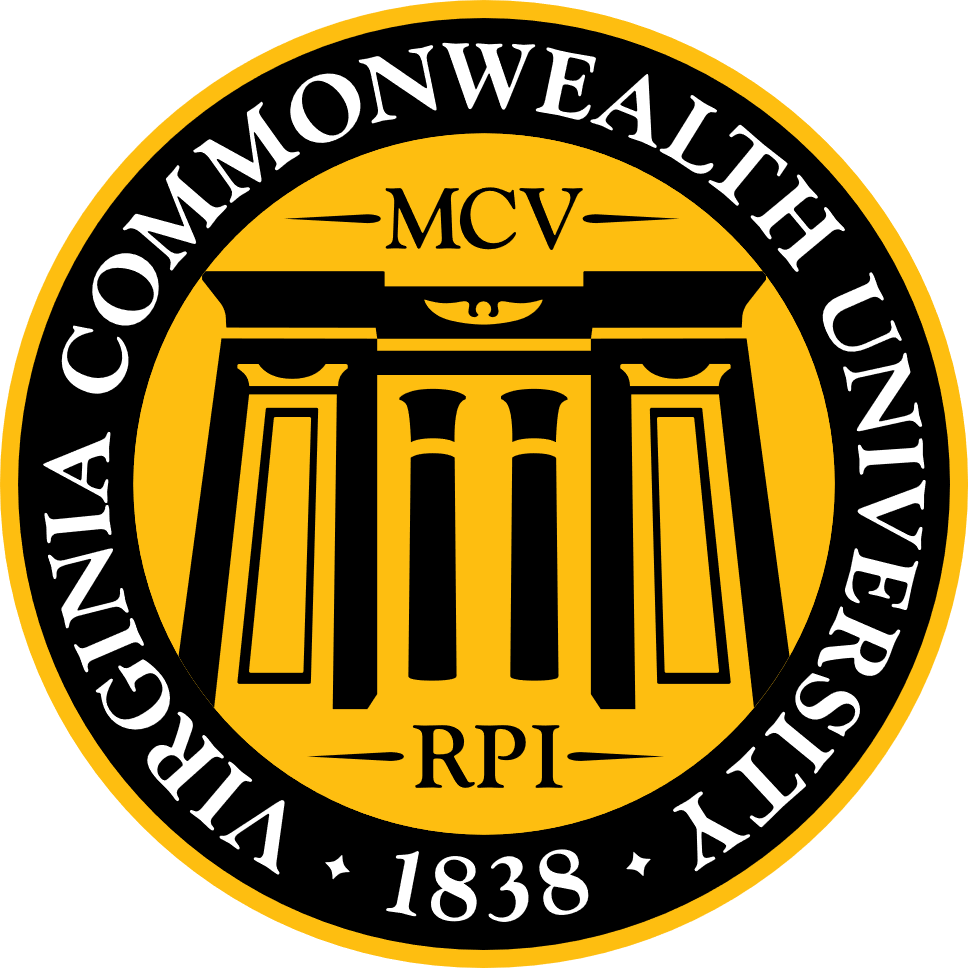
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**VIRGINIA COMMONWEALTH UNIVERSITY**

**Statistical analysis and modelling (SCMA 632)**

**A1b: IPL Dataset Analysis of – R/Python (Krunal Pandya)**

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**Date of Submission: 18-06-2024**

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**Introduction**

**Introduction**

The Indian Premier League (IPL) is one of the most prominent T20 cricket leagues globally, attracting top cricketing talents from around the world. As the league evolves, player performance and salary analysis become critical for teams to make strategic decisions regarding player acquisitions and contract renewals. This report focuses on the 2024 IPL season, analyzing detailed ball-by-ball performance data and player salary information. The primary objectives are to:

1. **Evaluate Top Performers**: Identify the top run-scorers and wicket-takers for the 2024 season.
2. **Correlation Analysis**: Examine the relationship between player salaries and their on-field performance.
3. **Distribution Fitting**: Determine the best statistical distribution for runs scored and wickets taken by key players.
4. **All-rounder Analysis**: Specifically analyze the performance of all-rounder Krunal Pandya to understand his contributions in both batting and bowling.

The findings from this analysis provide valuable insights into player performance metrics, aiding teams in optimizing their strategies for future seasons.

**Results**

**Top Three Run Getters:** The top three run-scorers for the 2024 season are:

1. **RD Gaikwad**: 509 runs
2. **V Kohli**: 500 runs
3. **B Sai Sudharsan**: 418 runs

**Top Three Wicket Takers:** The leading wicket-takers for the 2024 season are:

1. **HV Patel**: 19 wickets
2. **Mukesh Kumar**: 15 wickets
3. **Arshdeep Singh**: 14 wickets

**Correlation between Salary and Runs Scored:** The correlation coefficient between player salaries (in lakhs) and their total runs scored in the 2024 season is found to be 0.306, indicating a weak positive correlation.

**Performance of Krunal Pandya:** Krunal Pandya's performance over the seasons was analyzed in terms of runs scored and wickets taken. The correlation between his runs scored and wickets taken was found to be 0.652, indicating a strong positive correlation.

**Interpretations**

1. **Performance vs Salary:**
   * The weak positive correlation (0.306) between salary and runs scored suggests that while higher-paid players generally score more runs, the relationship is not particularly strong. This could be due to various factors such as the specific roles players are assigned within their teams, match conditions, and the varying levels of experience among players. Teams often pay premiums for star players who bring more than just on-field performance, including leadership, experience, and fan engagement.
2. **Key Players' Performance:**
   * RD Gaikwad, V Kohli, and B Sai Sudharsan’s high run tallies in the 2024 season highlight their critical importance to their teams. These players have consistently demonstrated their ability to score runs under different conditions, showcasing their versatility and skill. The identification of such key performers can help teams focus on retaining and nurturing their star players.
3. **Top Bowlers' Impact:**
   * HV Patel, Mukesh Kumar, and Arshdeep Singh emerged as the top wicket-takers, emphasizing their effectiveness in breaking partnerships and controlling the game's flow. The performance of these bowlers is crucial, as taking wickets at key moments can significantly alter the course of a match.
4. **Krunal Pandya's Versatility:**
   * The strong positive correlation (0.652) between runs and wickets for Krunal Pandya underscores his value as an all-rounder. All-rounders who can contribute significantly in multiple areas offer a strategic advantage, allowing for more flexible team compositions and better balance between batting and bowling departments. Krunal Pandya’s consistent performance in both disciplines makes him an indispensable asset to his team.
5. **Distribution Fitting Insights:**
   * The statistical distribution fitting of players’ performances helps in understanding the underlying patterns and variability in their performance metrics. This can aid in predictive modeling and scenario planning, allowing teams to anticipate potential performance trends and make informed decisions.

**Recommendations**

1. **Talent Identification and Retention:**
   * Teams should consider both performance metrics and potential when negotiating player contracts. While high salaries are often justified for top performers, identifying and nurturing emerging talent can provide cost-effective performance boosts.
2. **Balanced Team Composition:**
   * Teams should strive for a balanced composition with both high-performing batsmen and bowlers to ensure overall team success. The analysis of top run-getters and wicket-takers can help in strategic planning for player acquisitions and retention.
3. **Focus on All-rounders:**
   * All-rounders like Krunal Pandya, who contribute in multiple areas, should be given special attention during team selection and strategic planning, as they offer valuable flexibility and balance to the team.
4. **Data-Driven Decision Making:**
   * Teams should leverage detailed performance data and advanced statistical analyses to make informed decisions about player selection, game strategies, and contract negotiations. This approach can provide a competitive edge by optimizing player utilization and team dynamics.

**References**

* IPL Ball by Ball Dataset (2024)
* IPL Salaries Dataset (2024)