



Discipline of  
**Computer Science & Engineering**

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**Assignment - Executive M.Tech(AI)**  
**Course: AI**

**Due Date: 20/01/2025**

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### **Instructions**

1. Assignment submissions will be accepted only via Google Classroom. Submissions through email or any other methods will NOT be accepted. Please join Google Classroom using the following link: <https://classroom.google.com/c/NzEwMDcxMjk1NDA0?cjc=7752zx7>
  2. This is a graded assignment (20 points).
  3. The submission deadline is 20/01/2025. Please submit a single pdf file .
  4. Please read the assignment policy (uploaded on Google Classroom) carefully and follow all guidelines.
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1. This assignment requires you to independently study genetic algorithms (GAs) and solve a real-life optimization problem, demonstrating your understanding of GAs, their components, and applications. Provide a clear, step-by-step solution to the given problem.

## **Problem Statement**

XYZ app allows users to build fantasy IPL teams by selecting 11 players from a pool of available players. Your task is to design an optimal team using Genetic Algorithms (GAs) that maximizes the predicted points for an upcoming IPL match. You must adhere to XYZ's constraints while creating your team.

## **Player Pool**

The following table provides a list of players with their respective roles, teams, predicted points, and credit costs:

| Player ID | Player Name      | Role         | Team | Predicted Points | Credit Cost |
|-----------|------------------|--------------|------|------------------|-------------|
| 1         | Virat Kohli      | Batsman      | RCB  | 85               | 11          |
| 2         | Jasprit Bumrah   | Bowler       | MI   | 75               | 10.5        |
| 3         | MS Dhoni         | Wicketkeeper | CSK  | 65               | 9.5         |
| 4         | Hardik Pandya    | All-Rounder  | GT   | 95               | 10.5        |
| 5         | Rashid Khan      | Bowler       | GT   | 80               | 10          |
| 6         | Rohit Sharma     | Batsman      | MI   | 78               | 10.5        |
| 7         | Faf du Plessis   | Batsman      | RCB  | 82               | 11          |
| 8         | Ravindra Jadeja  | All-Rounder  | CSK  | 90               | 10.5        |
| 9         | Suryakumar Yadav | Batsman      | MI   | 88               | 10.5        |
| 10        | Mohammed Shami   | Bowler       | GT   | 70               | 9.5         |
| 11        | KL Rahul         | Wicketkeeper | LSG  | 86               | 11          |
| 12        | Yuzvendra Chahal | Bowler       | RR   | 77               | 9.5         |
| 13        | David Warner     | Batsman      | DC   | 84               | 10.5        |
| 14        | Shubman Gill     | Batsman      | GT   | 89               | 10          |
| 15        | Andre Russell    | All-Rounder  | KKR  | 92               | 10.5        |

Table 1: Player Pool for IPL Fantasy Team Selection

## Constraints

- **Team Composition:**
  - 1-2 Wicketkeepers
  - 3-6 Batsmen
  - 3-6 Bowlers
  - 1-4 All-Rounders
- **Credit Limit:** The total cost of all selected players must not exceed 100 credits.
- **Team Representation:** You can select a maximum of 7 players from any one IPL team.

## Objective

Maximize the total predicted points of the selected team while meeting all the above constraints.

[**Note:** You may make assumptions if you feel the table or problem description lacks clarity in order to solve the problem.]