Predict the Best Team for Fantasy Premier League 2018-2019

WQD7011
Numerical Optimization

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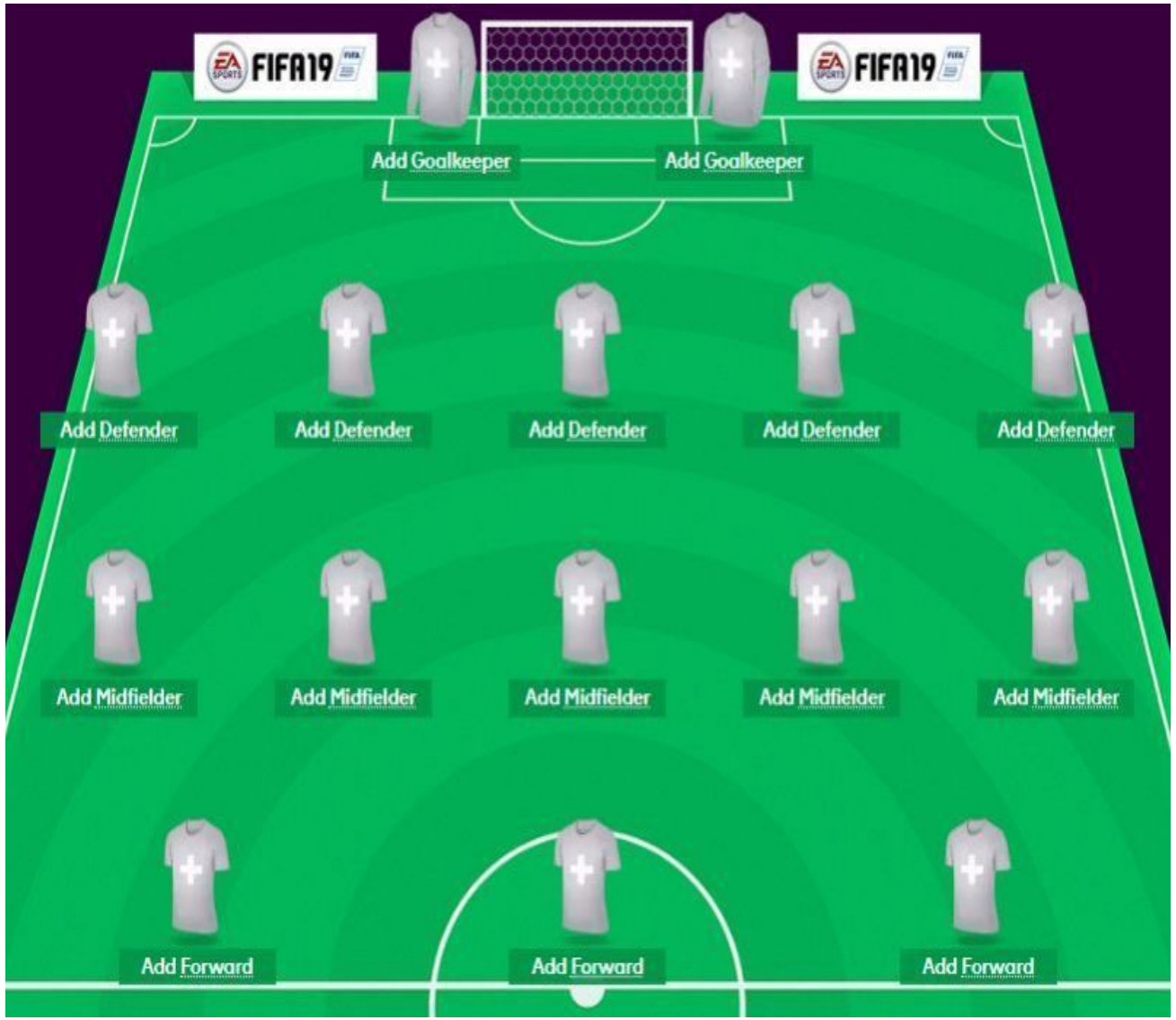
Contents

Introduction

- Team managers spend lots of time in constructing what he perceive to be the winning formula.
- Everybody has their way, their approach towards the game and it requires strategic and analytical thinking, along with a huge chunk of luck.



Problem Statement

- Ideally, as a team manager, he/she can select whichever player should be playing for any games.
- In reality, a team manager has a problem to select only 15 players for every game due to normally total team consists of 20 to 30 players.
- As a consequence, team board management normally set the budget for the team manager to set their best team in order to win the games.
- Thus, as a proposal Linear Optimization to be used to help the team manager to select their best teams will conditions to fulfill all the requirements/ constraints.

Dataset

Information for the last gameweek of last season (2017-18)

21 variables i.e.

- Name
- Team
- Position
- Cost

Data update as and when API updates

500 rows

Premier League

Objective Functions

Maximize the point => $56*x_0 + 72*x_1 + 169*x_2 + 102*x_3 + \ldots Points*x_n$

To maximize the point earn by using Constraint Optimization (Linear Optimization) algorithm with given a budget (total cost) 1200 and 15 players (2GKP, 5DEF, 5FWD, 3FWD)

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Constraints

1. Cash constrain: $45*x_0 + 45*x_1 + 110*x_2 + 50*x_3 + \ldots \text{Cost}*x_n \leq 1200$
2. GKP Player Position: $x_1 + x_{30} + x_{38} + x_{48} + \ldots x_n$ (GKP position ONLY) = 2
   - *Saves > 40
3. DEF Player Position: $x_0 + x_3 + x_5 + x_6 + \ldots x_n$ (DEF position ONLY) = 5
4. MID Player Position: $x_4 + x_8 + x_{10} + x_{11} + \ldots x_n$ (MID position ONLY) = 5
5. FWD Player Position: $x_2 + x_{12} + x_{15} + x_{18} + \ldots x_n$ (FWD position ONLY) = 3
6. Assists ≥ 90
7. Yellow Cards ≤ 20
8. Goals Scored ≥ 150
9. Minutes ≥ 44100

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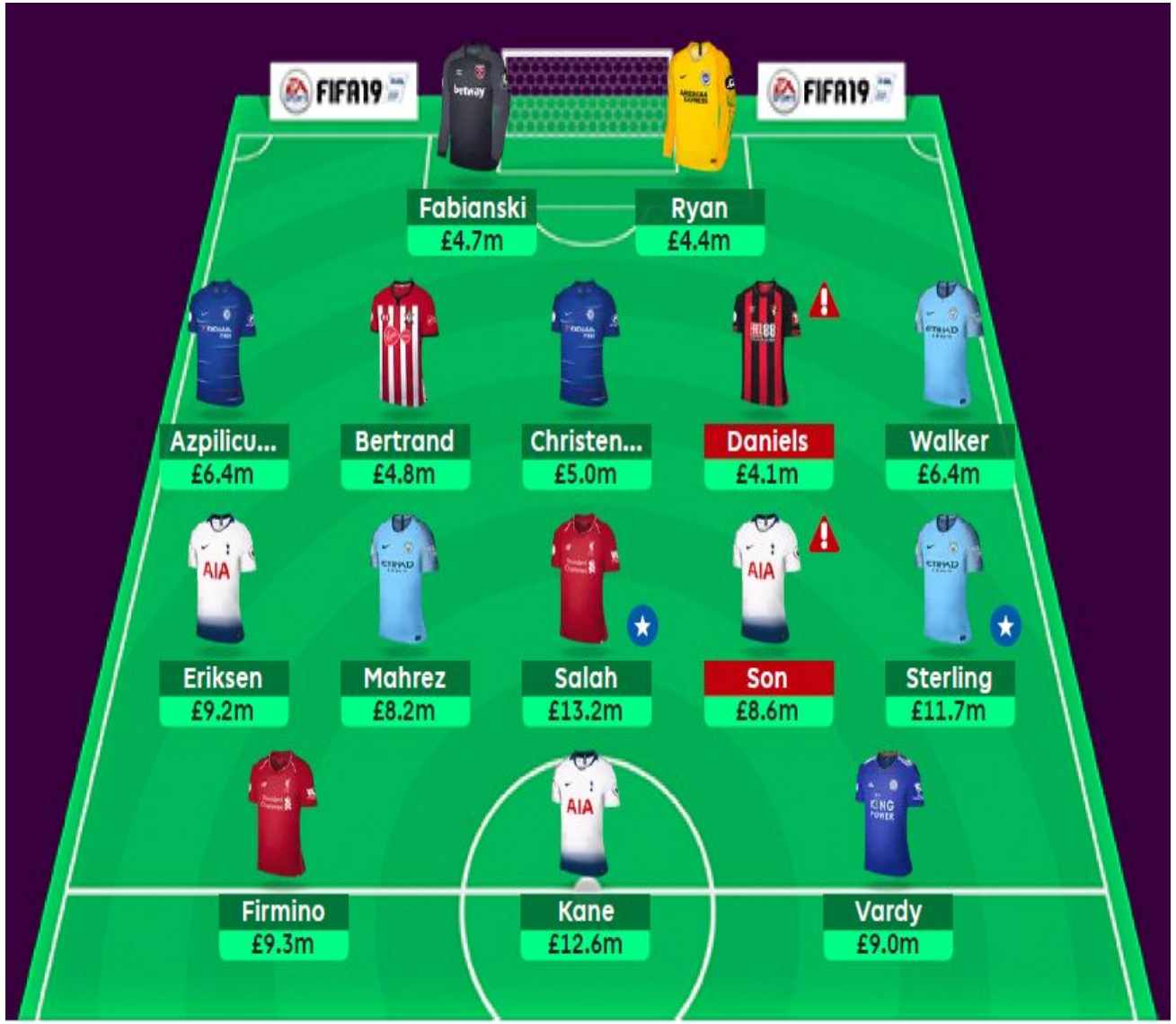
Results

Total Cost	: 1190
Total Points	: 2577
Total Goals	: 152
Total Assists	: 92
Total Yellow Cards	: 20
Total Minutes	: 44186



Discussion

Results:

Achieved objective function.

Constraint	Plan	Actual	Status
Cost	≤ 1200	1190	OK
GKP	2	2	OK
DEF	5	5	OK
MID	5	5	OK
FWD	3	3	OK
Goals	≥ 150	152	OK
Assists	≥ 90	92	OK
Yellow Cards	≤ 20	20	OK
Minutes	≥ 44100	44186	OK
Points		**2577**	**GOOD**

Conclusion

Linear Optimization can be used as a tool to solve for any constraint problem.

Question: Linear Optimization can be used in Football or other sports for reality?

Answer: Yes, but in reality another constraint should be consider i.e. Players Fitness. Thus, this additional data must be recorded and monitored by Team Management.