$$\min_{x \in \mathbb{R}^n} \quad f(x) = -\sum_{ij} w_{ij} x_{ij} \quad (f(x) \Rightarrow \text{Expected Value})$$

s.t.

$$g_1(x) = \sum x_i c_i - 81.5 \leq 0$$

$$h_1(x) = \sum x_i - 11 = 0$$

$$h_2(x) = \sum x_{i,1} - 1 = 0$$

$$g_2(x) = \sum x_{i,2} - 5 \leq 0$$

$$g_3(x) = -\sum x_{i,2} + 3 \leq 0$$

$$g_4(x) = \sum x_{i,3} - 5 \leq 0$$

$$g_5(x) = -\sum x_{i,3} + 2 \leq 0$$

$$g_6(x) = \sum x_{i,4} - 3 \leq 0$$

$$g_7(x) = -\sum x_{i,4} + 1 \leq 0$$

$x_i \Rightarrow$ No. of players/team
$w_i \Rightarrow$ team level projection
$\Rightarrow$ position level projection
$C_i \Rightarrow$ team level cost

$3 \leq DEF \leq 5$	2
$1 \leq FWD \leq 3$	4
$2 \leq MID \leq 5$	3
$GK = 1$	1

2 DEF → 8m
1 GK → 4m
1 FWD/MID → 4.5
% bench cost

second variable to make this NLP

- 80% — starting
- 15% — bench
- 5% — not in squad
- m — avg. min

$$xMin = 0.8 \times M + 0.15 \times \frac{3}{8}$$

Change this to 2-outcomes
plays $\Rightarrow$ 90% doesn't play = 10%
Assuming every player in XI has p % chance of playing,

$$EV = (p) \sum_{ij}^{11} w_{ij} x_{ij} + (1-p) B_1 + (1-p)^2 B_2 + (1-p)^3 B_3$$