

## Lesson 8. Drafting a Fantasy Basketball Team

### The problem

You're preparing for your upcoming fantasy basketball draft. You wonder: what is the best possible team you can draft? You have the following data:

- Projected **auction prices** for each player in the NBA.
- The **z-score** for each player: the sum of the number of standard deviations above the mean in the following 9 categories:
  1. points per 36 minutes
  2. 3 point field goals made per 36 minutes
  3. number of rebounds per 36 minutes
  4. number of assists per 36 minutes
  5. number of steals per 36 minutes
  6. number of blocks per 36 minutes
  7. *negative* of the number of turnovers per 36 minutes
  8. field goal percentage
  9. free throw percentage

Your roster must have exactly 12 players, and you have a budget of \$50. You want to maximize the total z-score of your team. Formulate this problem as a dynamic program by giving its shortest/longest path representation.

Stage  $t$  represents considering player  $t$  ( $t=0,1,\dots,T-1$ ) or the end of the decision-making process ( $t=T$ )

Node  $t_{n_1, n_2}$  represents  $n_1$  remaining budget and  $n_2$  remaining roster spots at stage  $t$   
 ( $n_1 = 0, 1, \dots, 50$ ;  $n_2 = 0, 1, \dots, 12$ )

Find the longest path

