**NBA Playoffs – Point Spreads, Over/Under and Scoring Outcomes**

Oddsmakers place 2 common lines on NBA games: Point Spread and Over/Under.

* Home Team Point Spread: How many points the home team starts ahead by (Negative => Favorite)
* Over/Under: Total Points for both teams
* Population: N = 2196 NBA playoff games from 1991-2018 (8 games with no Over/Under are removed)

Data Analysis: Over/Under (X1) and Total Points (X2)



* Consider taking random samples of n = 25 games, and computing  give 
* Take 10000 random samples from the population and give the empirical values: 
* Consider the difference . Give its mean and variance. Give the 2.5 and 97.5% percentiles of the distribution.
* For the 10000 random samples above, give the empirical mean, variance, and (2.5,97.5) quantiles.
* Suppose that **X** follows a multivariate normal distribution (actually the marginals are heavy-tailed).
  + Write out the joint density 
  + Give the marginal distribution of Total Points: 
  + Give condititional distribution of Total Points, given the Over/Under 
  + Give the specific distributions when: X1 = 185, 200, 215

Multivariate Normal Distribution:

