Setear NFL Simulation

Iteration 3

Changes from Iteration 2 shown in green type.

The Pool of players eligible to be chosen by the General Manager should number 10,000.

Each player should have a First name, a Last name, an Athleticism score, a Fit score, a Position Scores, an Age, a Wonderlic Score, and a Salary. Look for a big list of first names and last names somewhere (maybe a list of high school graduates from a big high school?).

The distributions of Athleticism should be one-tailed: there should be very few players at the top of the Athleticism scale and lots at the bottom. The median should be 50. Athleticism should decline with Age by 2 points per year over 21.

Each player in the Pool has an Age. Age is distributed uniformly between 21 and 35. Players age one year in the off-season. (Note: players aged in the previous iteration, but I forgot to mention it here.)

Each player has a Position Scores. Position Scores is a string of 6 numbers. The positions on Defense are Secondary, Linebacker, and Defensive Line. The positions on Offense are Offensive Line, Receiver, and Running Back. [Note: For now, I’ve dropped the Quarterback position that I mentioned at the meeting.) For each position, each player has a score between 0 and 100, where 100 is the position for which the player is best suited and 0 a position for which the player is utterly unsuited. See Appendix A for further description.

The Fit score in the Pool should be uniformly distributed between 0 and 100.

Salaries should be a function of three factors: Age, Fit, and Athleticism. Salaries increase with Age, decrease with the absolute value of the difference between Fit and the player’s coach’s Scheme Factor, and increase with Athleticism. (Note: I decided to have salary increase with age, not decrease.) Let’s try the formula

Salary = { Age + (100 - | Fit – Scheme | + Athleticism } x $100,000

All contracts are for one year.

There should be 8 teams. Each team has a Home (which is a city). Each City has a Population. (Use the SMSA from the 2010 Census.) Use the team names from the Northern and Southern divisions of the American Football Conference, but just use one 8-team conference.

Each team has an Owner. Each Owner has a Happy value and an Unhappy value and a Patience. Set everyone’s Happy at 12 and Unhappy at 6.. Patience is uniformly distributed between -3 and 3.

Each team should have a General Manager. At the beginning of the multi-season run, the General Managers will alternate a pick from the Pool until each team has 50 players.

In the first round of picks, all General Managers “focus on” Running Backs. In the second round, they all “focus on” Receivers. Then, in subsequent rounds, Offensive Line, Secondary, Linebackers, Defensive Line. Then the cycle repeats: Running Backs, Receivers, Offensive Line, etc.

The GM looks for a Player with a High rating in the focused-on position. If the GM finds only one such Player, he picks that player. If he finds more than one, then pick the player among them with the highest Athleticisms. If more than one player has the highest Athleticism, break the tie with the Wonderlic Score. If there is a tie in Wonderlic Scores, then break that tie randomly.

If he finds no players rated High at the focused-on position, then he picks the player with a Medium at that position who has the highest Athleticism. If no Mediums, then a Low. If no Lows, then he picks the Player with the highest Athleticism. If more than one player has the highest Athleticism, break the tie with the Wonderlic Score. If there is a tie in Wonderlic Scores, then break that tie randomly.

At the beginning of the first season, the General Manager for a Team randomly chooses a Coach for the GM’s team. Go in the order of city name, alphabetized.

There will be four seasons in a run.

Each season’s schedule will be 14 games long in each season. Each team will play every other team twice, once at Home and once as a Visitor.

Each Coach will take the 50 players on his team and randomly choose 22 uninjured players as the starting team, except that 11 players must have Offense as a Position and 11 must have Defense as a Position.

There is a pool of 100 Coaches. Each Coach has a first name of “Coach.” Each Coach has a last name. Each Coach has a Scheme Value, chosen randomly from a uniform distribution between 25 and 75. Each Coach has a salary of $1,000,000 coming out of the initial pool.

The Team’s Determinate Team Component will be the sum for the 22 starters of (Athleticism – | Scheme – Fit | ).

The Team’s Stochastic Team Component will be the product of 10 and a number chosen randomly from a normal distribution with a mean of 0 and a variance of 1.

The Team’s Field Advantage Component will be 7 if the team is at Home and 0 if a Visitor (at the other team’s Home).

The Team’s Scoring will be the sum of the three components set out above.

The Team with the higher Scoring wins.

Each game may lead to injuries. After each game, for each Starter, draw a random number uniformly distributed between 0 and 1. On a result of 0.9 or higher, the Player is injured and ineligible for the next game. The number of games missed is an asymmetrical distribution with a mean of 2 and a long right tail (that is, you can’t be injured for less than 1 game, but you can be injured for 100 games).

Each Team gains Revenue from each game. For the team at Home, the Revenue from a game is the population of its SMSA divided by 10. For the team that is a Visitor, the Revenue from a game is 0. Additionally, the winning team receives $100,000.

At the end of the sixteen-game season, each team should have a Won-Loss record and a seasonal total of Revenue(s). Additionally, the team with the best Won-Loss record at the end of the season (break ties randomly) receives $1,000,000.

**The Off-Season.**

~~As mentioned above, all players injured in the final game of the season leave all Pools.~~

During the off-season, the Fit value of every player becomes closer to the Scheme Value of the Coach by the Coach’s Teaching Factor. The distribution of Teaching Factor should be normally distributed among Coaches with a mean of 5 and a standard deviation of 0.5. (If the Fit value of the player is already within the Teaching Factor of the Scheme Value, then the Fit value is set equal to the Scheme Value.)

During the first off-season, all Coaches carry over to the next season. In subsequent seasons, however, the Owner might fire the Coach based on the team’s win-loss record. If the team won at least Happy games, then the Owner will not fire the Coach. If the team won equal to or fewer than Unhappy games, then the Owner will fire the Coach. If the team won a number of games less than Happy and more than Unhappy, then the Owner will retain the Coach so long as this year’s number of wins is greater than Patience plus last year’s wins.

Examples with values: Happy 12, Unhappy 4, Patience 1.

Last Year’s Wins 9, This Year’s Wins 11. Coach stays.

Last Year’s Wins 14, This Year’s Wins 13. Coach stays.

Last Year’s Wins 12, This Year’s Wins 11. Coach fired.

(Note that Patience can be negative. This means a team can lose more games this year than last year but keep its coach.)

Adjust the Fit value of that Team’s players by the Teaching Factor BEFORE it gets a new Coach. Then the GM randomly selects a Coach from the Coach Pool.

The Coach’s salary is set to $600,000, plus $100,000 more for every win in the just-finished season.

During the off-season, each player’s Age increases by 1 year. All players who reach age 40 leave all Pools and Teams. For every player who ages out of the pool, add a 21-year-old player (aka a Rookie) to the Player pool. Rookies have the same distribution of Athleticism and Fit as the initial pool had.

Injuries and aging will cause some teams to have fewer than 50 players. To get back to 50 players, teams will conduct a draft of the 21-year-old players in the Pool. In each round of the draft, teams will pick in the same order, by reverse order of Won-Loss Record. (Break ties randomly, once, at the beginning of the draft.) Each team will pick the available player with the highest Athleticism score. Each team keeps participating in the rounds until it has 50 players again.

At the beginning of each season, each Team has a Payroll. This consists of the sum of the 50 Player’s salaries and the Coach’s salary. Injured players draw their usual pay. Exception: A player whose injury will cause them to miss the entire season has a salary of $0. Such a player goes on an Injured Reserve List for the season.

Appendix A

Position Matrix

[At the moment, it really only has one dimension, so it’s not technically a matrix.)

A player will either have positive values for the Offensive Positions and zeros for the Defensive Positions, or positive values for the Defensive Positions and zeros for the Offensive Positions.

Since there are three positions with positive scores, there will be a High score, a Medium score, and a Low Score.

Eventually, the scores will take lots of values. For now, however, set the High score to 100, the Medium score to 67, and the Low score to 33. Each player has exactly one of each score.

With three values of three variables, there would ordinarily be 10 possible arrangements. If we prohibit ties (e.g., High, High, Low), then there are six arrangements. It doesn’t make sense to me that someone who was awesome as a defensive lineman would be better in the secondary than as a linebacker, however, nor that an excellent defensive back would be better as a lineman than a linebacker. So, constrain the combinations:

Defense

Defensive Line High, Linebacker Medium, Secondary Low

~~Defensive Line High, Linebacker Low, Secondary Medium~~

Defensive Line Medium, Linebacker High, Secondary Low

~~Defensive Line Medium, Linebacker Low, Secondary High~~

Defensive Line Low, Linebacker High, Secondary Medium

Defensive Line Low, Linebacker Medium, Secondary High

Similar ideas give us the following combinations for offense:

Offense

Offensive Line High, Running Back Medium, Receiver Low

Offensive Line Medium, Running Back High, Receiver Low

Offensive Line Low, Running Back High, Receiver Medium

Offensive Line Low, Running Back Medium, Receiver High

Distribute the four possibilities randomly for a given player on that side of the ball. That is, a quarter of the offense would be High / Medium / Low, a quarter Medium / High / Low, etc.