Applied Artificial Intelligence Project - 4

Username: zodiac123

Domain: Tennis Players Prediction using Bayesian Networks in Netica

Tennis Player Predictor is designed using the Bayesian Network into evaluate player credentials based on game play attributes. There are online legal gambling websites like bet365.com where the users can bet on a player legally. Tennis Player Predictor helps the user to make a bet on a certain player by analyzing various parameters. There are three possible decisions which the Tennis Player Predictor will provide based on the analysis done, which are as follows 1) Safe Bet 2) Moderately Safe Bet 3) Ambitious Bet. This is done by analyzing various parameters like player profile, player skills, court compatibility and current form of the player. In addition to these two nodes, Utility and Decision nodes has been added.

Parameters based on which the evaluation is done:

1. Player Profile: This parameter considers various factors like Age, Rank and Win Percentage of the player.

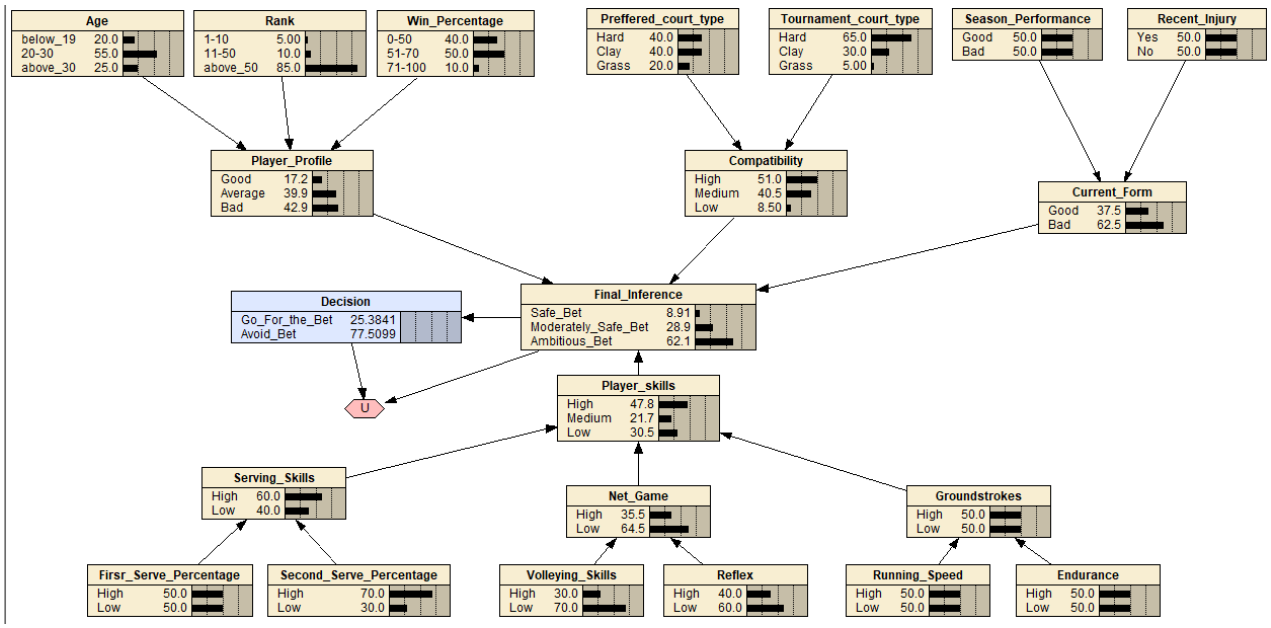
2. Court Compatibility: Compatibility check is done by comparing the preferred court type of the player with the court type of the tournament. Compatibility is said to be high when a clay court player is participating in a clay court tournament or when a grass court player is participating in a grass court tournament. But having said that Hard court players are flexible in this case i.e. they can adapt to clay or grass court tournaments. This is because of the hard court conditions. Grass and Clay court condition is said to differ a lot whereas the hard falls right in between grass and clay court. If we consider pace as a parameter here, grass is said to be the fastest, clay court is said to be the slowest and clay court has moderate pace.

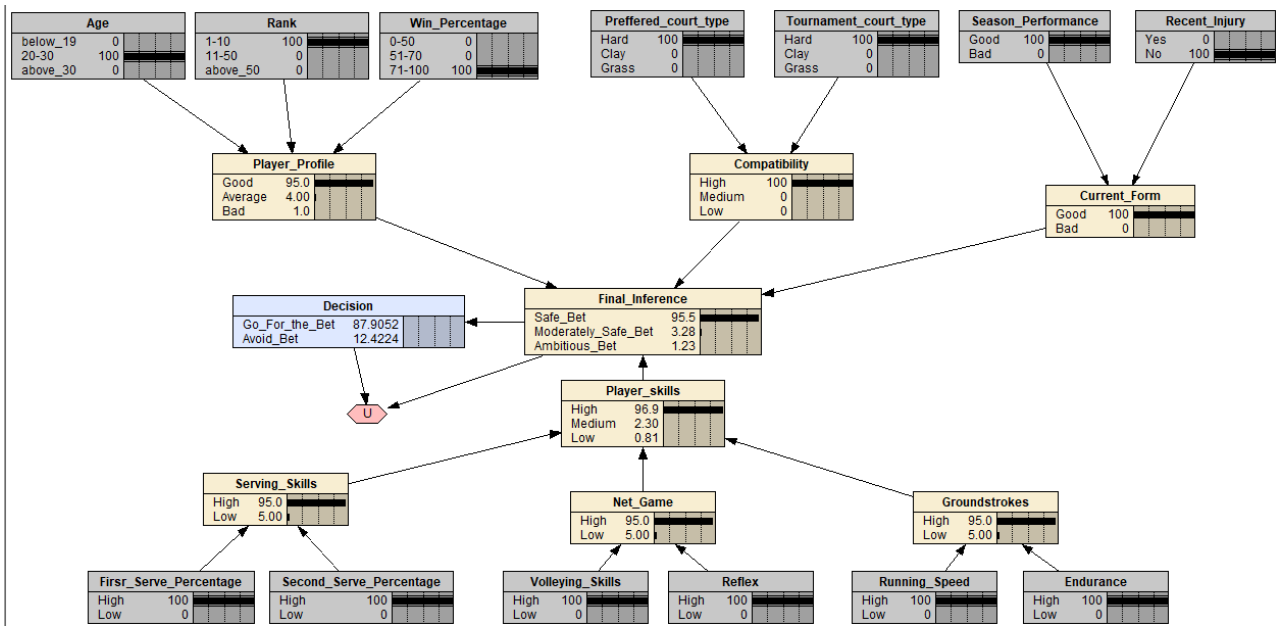
3. Current Form: This parameter plays a major role in determining the outcome of the player. Here factors like physical state[fitness] and the current season's performance of the player is considered.

4. Playing Skills: Here we evaluate the basic skills of a tennis player. For example, service, net game and groundstrokes these three factors form the basic skillset of a tennis player. If the player is poor at all these three skills mentioned above it would not be advisable to bet on the player.

5.**Utility function** : In addition to the above parameter two nodes, Utility and Decision nodes has been added. Based on the decision node and the inferred value we assign values to the Utility node in such a way that wrong decisions are punished more.
For example: If the inferred value says that it is an ambitious bet then the decision to go ahead with the bet will be punished severely.

Test Case:


Age
below_19 20.0
20-30 55.0
above_30 25.0
Rank
1-10 5.00
11-50 10.0
above_50 85.0
Win_Percentage
0-50 40.0
51-70 50.0
71-100 10.0
Preffered_court_type
Hard 40.0
Clay 40.0
Grass 20.0
Tournament_court_type
Hard 65.0
Clay 30.0
Grass 5.00
Season_Performance
Good 50.0
Bad 50.0
Recent_Injury
Yes 50.0
No 50.0
Player_Profile
Good 17.2
Average 39.9
Bad 42.9
Compatibility
High 51.0
Medium 40.5
Low 8.50
Current_Form
Good 37.5
Bad 62.5
Decision
Go_For_the_Bet 25.3841
Avoid_Bet 77.5099
Final_Inference
Safe_Bet 8.91
Moderately_Safe_Bet 28.9
Ambitious_Bet 62.1
U
Player_skills
High 47.8
Medium 21.7
Low 30.5
Serving_Skills
High 60.0
Low 40.0
Net_Game
High 35.5
Low 64.5
Groundstrokes
High 50.0
Low 50.0
Firsr_Serve_Percentage
High 50.0
Low 50.0
Second_Serve_Percentage
High 70.0
Low 30.0
Volleying_Skills
High 30.0
Low 70.0
Reflex
High 40.0
Low 60.0
Running_Speed
High 50.0
Low 50.0
Endurance
High 50.0
Low 50.0


Age
below_19 0
20-30 100
above_30 0
Rank
1-10 100
11-50 0
above_50 0
Win_Percentage
0-50 0
51-70 0
71-100 100
Preffered_court_type
Hard 100
Clay 0
Grass 0
Tournament_court_type
Hard 100
Clay 0
Grass 0
Season_Performance
Good 100
Bad 0
Recent_Injury
Yes 0
No 100
Player_Profile
Good 95.0
Average 4.00
Bad 1.0
Compatibility
High 100
Medium 0
Low 0
Current_Form
Good 100
Bad 0
Decision
Go_For_the_Bet 87.9052
Avoid_Bet 12.4224
Final_Inference
Safe_Bet 95.5
Moderately_Safe_Bet 3.28
Ambitious_Bet 1.23
U
Player_skills
High 96.9
Medium 2.30
Low 0.81
Serving_Skills
High 95.0
Low 5.00
Net_Game
High 95.0
Low 5.00
Groundstrokes
High 95.0
Low 5.00
Firsr_Serve_Percentage
High 100
Low 0
Second_Serve_Percentage
High 100
Low 0
Volleying_Skills
High 100
Low 0
Reflex
High 100
Low 0
Running_Speed
High 100
Low 0
Endurance
High 100
Low 0

Instructions to run:

1.Open “Tennis.dne” on Netica
2.Compile it
3.Vary the probabilities to see changes in the result