SPORTS PREDICTION

Roll Numbers:

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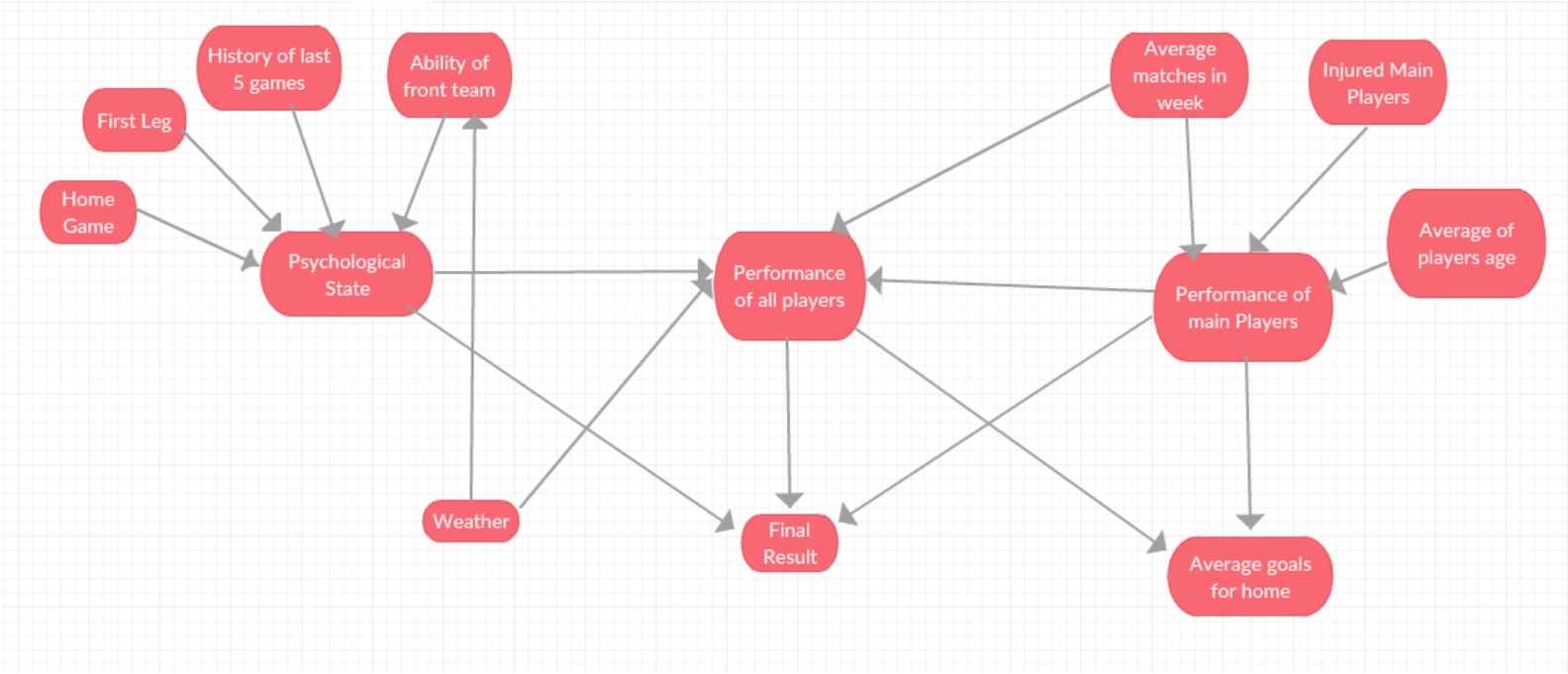
Bayesian Network Diagram:



Keys:

W	Weather	Good(Sunny, Overcast), Bad(Snowy, Rainy)
H5	History of last 5 games	Win, Draw, Loss
RFT	Result against for teams(first leg)	Win, Draw, Loss
HG	Home Game	True, False
AFT	Ability of front team	High, Medium, Low
PS	Psychological State	Great, Good, Bad
APA	Average of players age	High, Medium, Low

IMP	Injured Main Players	Yes, No
PMP	Performance of main players	High, Medium, Low
PAP	Performance of all players	High, Medium, Low
AGH	Average goals for home	High, Medium, Low
AMW	Average matches in a week	High, Medium, Low
RES	Final Result	Win

Conditional Probability Tables

Weather:

W	Good	Bad
P(W)	0.6	0.4

History of last 5 games:

H5	Win	Draw	Loss
P(H5)	0.5	0.3	0.2

Result against for teams:

RFT	Win	Draw	Loss
P(RFT)	0.5	0.3	0.2

Home Game:

HG	True	False
P(HG)	0.5	0.5

Average goals in all home matches:

AGAHM	High	Medium	Low
P(AGAHM)	0.6	0.3	0.1

Ability of front team:

Weather	High	Medium	Low
Good	0.6	0.3	0.1
Bad	0.3	0.4	0.3

Pyschological State:

History of	Result	Home Game	Ability of	Great	Good	Bad

Last 5 games	against for teams		front team			
Win	Win	True	High	0.7	0.2	0.1
Draw	Win	True	High	0.5	0.35	0.15
Loss	Win	True	High	0.35	0.45	0.2
Win	Draw	True	High	0.6	0.3	0.1
Draw	Draw	True	High	0.4	0.45	0.15
Loss	Draw	True	High	0.3	0.4	0.3
Win	Loss	True	High	0.6	0.3	0.1
Draw	Loss	True	High	0.3	0.5	0.2
Loss	Loss	True	High	0.3	0.4	0.3
Win	Win	False	High	0.65	0.1	0.25
Draw	Win	False	High	0.45	0.25	0.3
Loss	Win	False	High	0.3	0.35	0.35
Win	Draw	False	High	0.55	0.2	0.25
Draw	Draw	False	High	0.35	0.35	0.3
Loss	Draw	False	High	0.25	0.3	0.45
Win	Loss	False	High	0.55	0.3	0.25
Draw	Loss	False	High	0.25	0.4	0.35
Loss	Loss	False	High	0.25	0.3	0.45
Win	Win	True	Medium	0.65	0.25	0.1
Draw	Win	True	Medium	0.55	0.4	0.15
Loss	Win	True	Medium	0.3	0.5	0.2
Win	Draw	True	Medium	0.55	0.35	0.1
Draw	Draw	True	Medium	0.45	0.5	0.15
Loss	Draw	True	Medium	0.25	0.45	0.3
Win	Loss	True	Medium	0.55	0.35	0.1
Draw	Loss	True	Medium	0.25	0.55	0.2
Loss	Loss	True	Medium	0.25	0.45	0.3
Win	Win	False	Medium	0.6	0.15	0.25
Draw	Win	False	Medium	0.45	0.25	0.3
Loss	Win	False	Medium	0.25	0.4	0.35
Win	Draw	False	Medium	0.5	0.25	0.25
Draw	Draw	False	Medium	0.3	0.4	0.3
Loss	Draw	False	Medium	0.2	0.35	0.45
Win	Loss	False	Medium	0.5	0.35	0.25
Draw	Loss	False	Medium	0.2	0.45	0.35

Loss	Loss	False	Medium	0.2	0.35	0.45
Win	Win	True	Low	0.6	0.15	0.25
Draw	Win	True	Low	0.4	0.3	0.3
Loss	Win	True	Low	0.25	0.4	0.35
Win	Draw	True	Low	0.5	0.25	0.25
Draw	Draw	True	Low	0.3	0.4	0.3
Loss	Draw	True	Low	0.2	0.35	0.45
Win	Loss	True	Low	0.5	0.25	0.25
Draw	Loss	True	Low	0.2	0.45	0.35
Loss	Loss	True	Low	0.2	0.35	0.45
Win	Win	False	Low	0.55	0.05	0.4
Draw	Win	False	Low	0.35	0.2	0.45
Loss	Win	False	Low	0.2	0.3	0.5
Win	Draw	False	Low	0.45	0.25	0.4
Draw	Draw	False	Low	0.25	0.3	0.45
Loss	Draw	False	Low	0.15	0.25	0.6
Win	Loss	False	Low	0.45	0.25	0.4
Draw	Loss	False	Low	0.15	0.35	0.5
Loss	Loss	False	Low	0.15	0.25	0.6

Injured Main Players:

IMP	Yes	No
P(IMP)	0.5	0.5

Average of Players Age:

APA	High	Medium	Low
P(APA)	0.1	0.3	0.6

Average Matches in a Week:

AMW	High	Medium	Low
P(AMW)	0.1	0.3	0.6

Performance of main players:

Injured Main Players	Average of players age	Average matches in a	High	Medium	Low

		week			
Yes	High	High	0.1	0.2	0.7
Yes	Medium	High	0.15	0.25	0.6
Yes	Low	High	0.18	0.28	0.54
No	High	High	0.2	0.25	0.55
No	Medium	High	0.45	0.3	0.25
No	Low	High	0.5	0.3	0.2
Yes	High	Medium	0.25	0.1	0.65
Yes	Medium	Medium	0.3	0.15	0.55
Yes	Low	Medium	0.33	0.18	0.49
No	High	Medium	0.35	0.15	0.5
No	Medium	Medium	0.6	0.2	0.2
No	Low	Medium	0.65	0.2	0.15
Yes	High	Low	0.1	0.15	0.75
Yes	Medium	Low	0.15	0.2	0.65
Yes	Low	Low	0.18	0.23	0.59
No	High	Low	0.2	0.2	0.6
No	Medium	Low	0.45	0.25	0.3
No	Low	Low	0.5	0.25	0.15

Performance of all players:

Performance of main players	Average matches in a week	Weather	Psychological State	High	Medium	Low
High	High	Good	Great	0.6	0.25	0.15
Medium	High	Good	Great	0.55	0.3	0.15
Low	High	Good	Great	0.15	0.45	0.4
High	Medium	Good	Great	0.65	0.3	0.05
Medium	Medium	Good	Great	0.55	0.35	0.1
Low	Medium	Good	Great	0.25	0.55	0.2
High	Low	Good	Great	0.9	0.05	0.05
Medium	Low	Good	Great	0.75	0.15	0.1

Low	Low	Good	Great	0.5	0.3	0.2
High	High	Good	Good	0.575	0.175	0.2
Medium	High	Good	Good	0.525	0.275	0.20
Low	High	Good	Good	0.125	0.425	0.45
High	Medium	Good	Good	0.625	0.275	0.1
Medium	Medium	Good	Good	0.525	0.325	0.15
Low	Medium	Good	Good	0.225	0.525	0.25
High	Low	Good	Good	0.875	0.025	0.1
Medium	Low	Good	Good	0.725	0.125	0.15
Low	Low	Good	Good	0.475	0.275	0.25
High	High	Good	Bad	0.55	0.15	0.25
Medium	High	Good	Bad	0.5	0.25	0.25
Low	High	Good	Bad	0.1	0.4	0.5
High	Medium	Good	Bad	0.6	0.25	0.15
Medium	Medium	Good	Bad	0.5	0.3	0.2
Low	Medium	Good	Bad	0.2	0.5	0.3
High	Low	Good	Bad	0.7	0.2	0.1
Medium	Low	Good	Bad	0.6	0.15	0.1
Low	Low	Good	Bad	0.45	0.25	0.3
High	High	Bad	Great	0.5	0.2	0.3
Medium	High	Bad	Great	0.45	0.25	0.3
Low	High	Bad	Great	0.35	0.15	0.5
High	Medium	Bad	Great	0.55	0.25	0.20
Medium	Medium	Bad	Great	0.45	0.3	0.25
Low	Medium	Bad	Great	0.15	0.5	0.35
High	Low	Bad	Great	0.7	0.1	0.2
Medium	Low	Bad	Great	0.6	0.2	0.2
Low	Low	Bad	Great	0.4	0.25	0.35
High	High	Bad	Good	0.5	0.15	0.35
Medium	High	Bad	Good	0.425	0.225	0.35
Low	High	Bad	Good	0.125	0.325	0.55
High	Medium	Bad	Good	0.525	0.225	0.25
Medium	Medium	Bad	Good	0.425	0.275	0.3
Low	Medium	Bad	Good	0.125	0.475	0.4
High	Low	Bad	Good	0.725	0.025	0.2
Medium	Low	Bad	Good	0.625	0.075	0.3
Low	Low	Bad	Good	0.375	0.225	0.4

High	High	Bad	Bad	0.45	0.1	0.4
Medium	High	Bad	Bad	0.4	0.25	0.35
Low	High	Bad	Bad	0.1	0.4	0.5
High	Medium	Bad	Bad	0.5	0.25	0.25
Medium	Medium	Bad	Bad	0.4	0.25	0.35
Low	Medium	Bad	Bad	0.1	0.45	0.45
High	Low	Bad	Bad	0.6	0.15	0.25
Medium	Low	Bad	Bad	0.5	0.15	0.2
Low	Low	Bad	Bad	0.3	0.1	0.6

Average goal for home:

Performance of all players	Performace of main players	High	Medium	Low
High	High	0.9	0.05	0.05
Medium	High	0.75	0.15	0.1
Low	High	0.6	0.25	0.15
High	Medium	0.7	0.2	0.1
Medium	Medium	0.5	0.3	0.2
Low	Medium	0.4	0.35	0.25
High	Low	0.45	0.3	0.25
Medium	Low	0.3	0.35	0.35
Low	Low	0.3	0.35	0.4

The final outcome of the prediction is dependent upon the Performanc of all the players in a particular team, the main crucial players of the particular team, and the psychological states.

Final Result:

Performance of all players	Performance of main players	Psychological State	Win
High	High	Great	0.9
Medium	High	Great	0.75
Low	High	Great	0.6
High	Medium	Great	0.7
Medium	Medium	Great	0.5
Low	Medium	Great	0.4
High	Low	Great	0.45
Medium	Low	Great	0.3
Low	Low	Great	0.3

High	High	Good	0.8
Medium	High	Good	0.7
Low	High	Good	0.55
High	Medium	Good	0.65
Medium	Medium	Good	0.55
Low	Medium	Good	0.4
High	Low	Good	0.45
Medium	Low	Good	0.4
Low	Low	Good	0.35
High	High	Bad	0.45
Medium	High	Bad	0.4
Low	High	Bad	0.1
High	Medium	Bad	0.5
Medium	Medium	Bad	0.4
Low	Medium	Bad	0.1
High	Low	Bad	0.6
Medium	Low	Bad	0.5
Low	Low	Bad	0.3

Justifications:

1) We took a football match into consideration.

2) Ideally the output of a football match is predicted by the number of star players playing in the football.

3) So the if there are main players playing in the team then a higher probability was assigned.

4) The ability of the front team also plays a key role in a game. So if there a strong front team then there are more chances for the team to win. Hence a higher value will be assigned.

5) The home ground of a sports match plays a crucial role. If a team plays in its own ground then there will be immense support from the crowd.

6) We also took into considerations the data abou the average age of the players because, if a player is young then he will be having more stamina.

7) Average matches in a week are also taken into consideration because this will give the fatigue levels of the player.

8) Injured players also is a crucial factor in predicting the winning side because if a important is injured in a side, then it will be huge blow to the side. Hence this is also taken into considerations

9) All the values have been assigned basing the importance of that particular value given a particular condition(s).

Sample Query:

P(FR=Win|PMP=High,IMP=No)

= P(FR=Win|PMP=High) * P(IMP=No)

The value of P(IMP=No) is already given in the tables above, as IMP is an independent node because it has no other nodes attached to it, we can get the value directly from the table.

Given that P(IMP=No) = 0.5

Now, for calculating the values for P(FR=Win|PMP=High).

Here there are multiple number of nodes attached to the FR node. Which are PMP, PAP, PS. These nodes further have a min of 3 nodes attached to it.

Calculating the values for these nodes is a long process.
Only for calculation purpose, we assume values for the nodes.

Assumed Values:

P(PS=Great) = 0.5
P(PS=Good) = 0.3
P(PS=Bad) = 0.2
P(PAP = High) = 0.5
P(PAP = Medium) = 0.3
P(PAP = Low) = 0.2
P(PMP = High) = 0.5
P(PMP = Medium) = 0.3
P(PMP = Low) = 0.2

Now we calculate the value for P(FR=Win|PMP=High) =

= {(0.5) * [(0.9 * 0.5 * 0.5) + (0.75 * 0.3 * 0.3) + (0.6*0.2*0.2)]} + {(0.3) * [(0.8 * 0.5 * 0.5) + (0.7 * 0.3 * 0.3) + (0.55 * 0.2 * 0.3)]} + {(0.2) * [(0.45 * 0.5 * 0.2) + (0.4 * 0.3 * 0.2) + (0.1 * 0.2 * 0.2)]}

= { 0.5 * (0.225 + 0.0675 + 0.024)} + {0.3 * (0.12 + 0.063 + 0.033)} + {0.2 * (0.045 + 0.024 + 0.004)}

= 0.15825 + 0.0648 + 0.073

= 0.29605

Now the value of P(FR=Win|PMP=High,IMP=No) is P(FR=Win|PMP=High) * P(IMP=No)

=> P(FR=Win|PMP=High,IMP=No) = 0.29605 * 0.5
=> P(FR=Win|PMP=High,IMP=No) = 0.148025