Problema 1

$$P(O_D \mid G_N, A_N, X_N) = \alpha \cdot \sum_{f \in \{F_D, F_N\}} P(G_N, A_N, f, O_D, X_N) =$$

$$= \alpha \cdot \sum_f P(G_D) \cdot P(A_N) \cdot P(f \mid G_N, A_N) \cdot P(O_D \mid f) \cdot P(X_N \mid f) =$$

$$= \alpha \cdot P(G_N) \cdot P(A_N) \cdot \sum_f P(f \mid G_N, A_N) \cdot P(O_D \mid f) \cdot P(X_N \mid f) =$$

$$= \alpha \cdot P(G_N) \cdot P(A_N) \cdot [(P(\bar{F}_D \mid G_N, A_N) \cdot P(O_D \mid F_D) \cdot P(X_N \mid F_D) +$$

$$(P(F_N \mid G_N, A_N) \cdot P(O_D \mid F_N) \cdot P(X_N \mid F_N)] =$$

$$= \alpha \cdot 0.9 \cdot 0.95 \cdot [(0.05 \cdot 0.6 \cdot 0.5) + (0.95 \cdot 0.2 \cdot 0.3)] =$$

$$= \alpha \cdot 0.15903$$

$$P(O_N \mid G_N, A_N, X_N) = 1 - P(O_D \mid G_N, A_N, X_N) = 1 - 0.15903 = 0.8$$

$$P(O_N \mid G_N, A_N, X_N) = \alpha \cdot \sum_{f \in \{F_D, F_N\}} P(G_N, A_N, f, O_N, X_N) =$$

$$= \alpha \sum_f P(G_N) \cdot P(A_N) \cdot P(f \mid G_N, A_N) \cdot P(O_N \mid f) \cdot P(X_N \mid f) =$$

$$= \alpha \cdot P(G_N) \cdot P(A_N) \cdot \sum_f P(f \mid G_N, A_N) \cdot P(O_N \mid f) \cdot P(X_N \mid f) =$$

$$= \alpha \cdot P(G_N) \cdot P(A_N) \cdot [(P(\bar{F}_D \mid G_N, A_N) \cdot P(O_N \mid F_D) \cdot P(X_N \mid F_D)) +$$

$$(P(\bar{F}_N \mid G_N, A_N) \cdot P(O_N \mid F_N) \cdot P(X_N \mid F_N) =$$

$$= \alpha \cdot 0.9 \cdot 0.95 \cdot [(0.05 \cdot 0.4 \cdot 0.5) + (0.95 \cdot 0.8 \cdot 0.9)] =$$

$$= \alpha \, 0.59337$$

Stim $P(O_D \mid G_N, A_N, X_N) + P(O_N \mid G_N, A_N, X_N) = 1 \Rightarrow$

$$\alpha \cdot 0.15903 + \alpha \cdot 0.59337 = 1$$

$$\alpha \cdot 0.7524 = 1$$

$$\alpha = \frac{1}{0.7524} = 1.3290 \Rightarrow$$

$$\begin{cases} P(O_D \mid G_N, A_N, X_N) = 1.3290 \cdot 0.15903 = 0.21136 \\ P(O_N \mid G_N, A_N, X_N) = 1.3290 \cdot 0.59337 = 0.7886 \end{cases}$$

Probability Table for Absces

	P(Absces=T)	*P(Absces=F)*
Prior Probability	0.05	0.95

No observed value for this node.

OK Cancel

Probability Table for Anorexie

Febra	P(Anorexie=T)	P(Anorexie=F)
T	0.5	0.5
F	0.1	0.9

No observed value for this node.

OK Cancel

Probability Table for Febra

Gripa	Absces	P(Febra=T)	P(Febra=F)
T	T	0.8	0.2
T	F	0.7	0.3
F	T	0.25	0.75
F	F	0.05	0.95

No observed value for this node.

OK Cancel

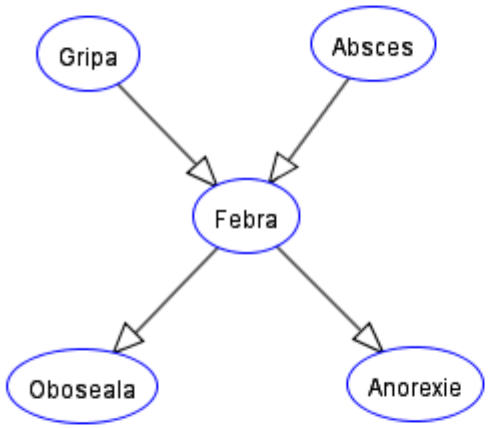
Belief and Decision Network Tool Version 5.1.10 --- untitled.xml

File Edit View Network Options Help

Create Node | Create Arc | Select | Delete | Set Properties | Modify Probability Table

Create | Solve

Click on a regular node to change its probability table.



Belief Network Mode

Probability Table for Gripa

	P(Gripa=T)	*P(Gripa=F)*
Prior Probability	0.1	0.9

No observed value for this node.

OK Cancel

Probability Table for Oboseala

Febra	P(Oboseala=T)	P(Oboseala=F)
T	0.6	0.4
F	0.2	0.8

No observed value for this node.

OK Cancel

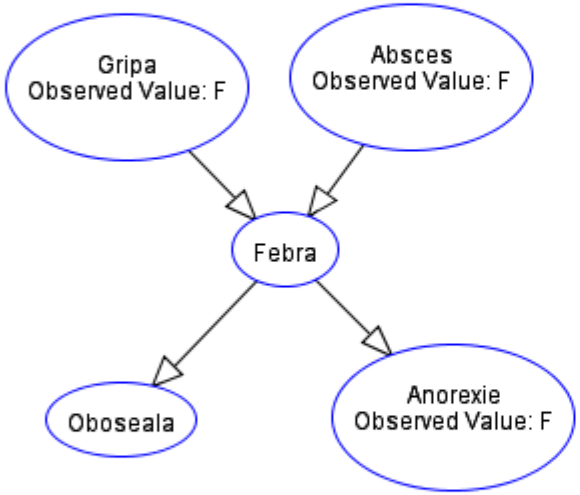
Belief and Decision Network Tool Version 5.1.10 --- Rezolvari IA.xml

File Edit View Network Options Help

Make Observation | Query | P(e) Query | Toggle Monitoring | Select | View Probability Table | View/Modify Decision | Add No-forgetting Arcs | Optimize Decisions | Independence Quiz

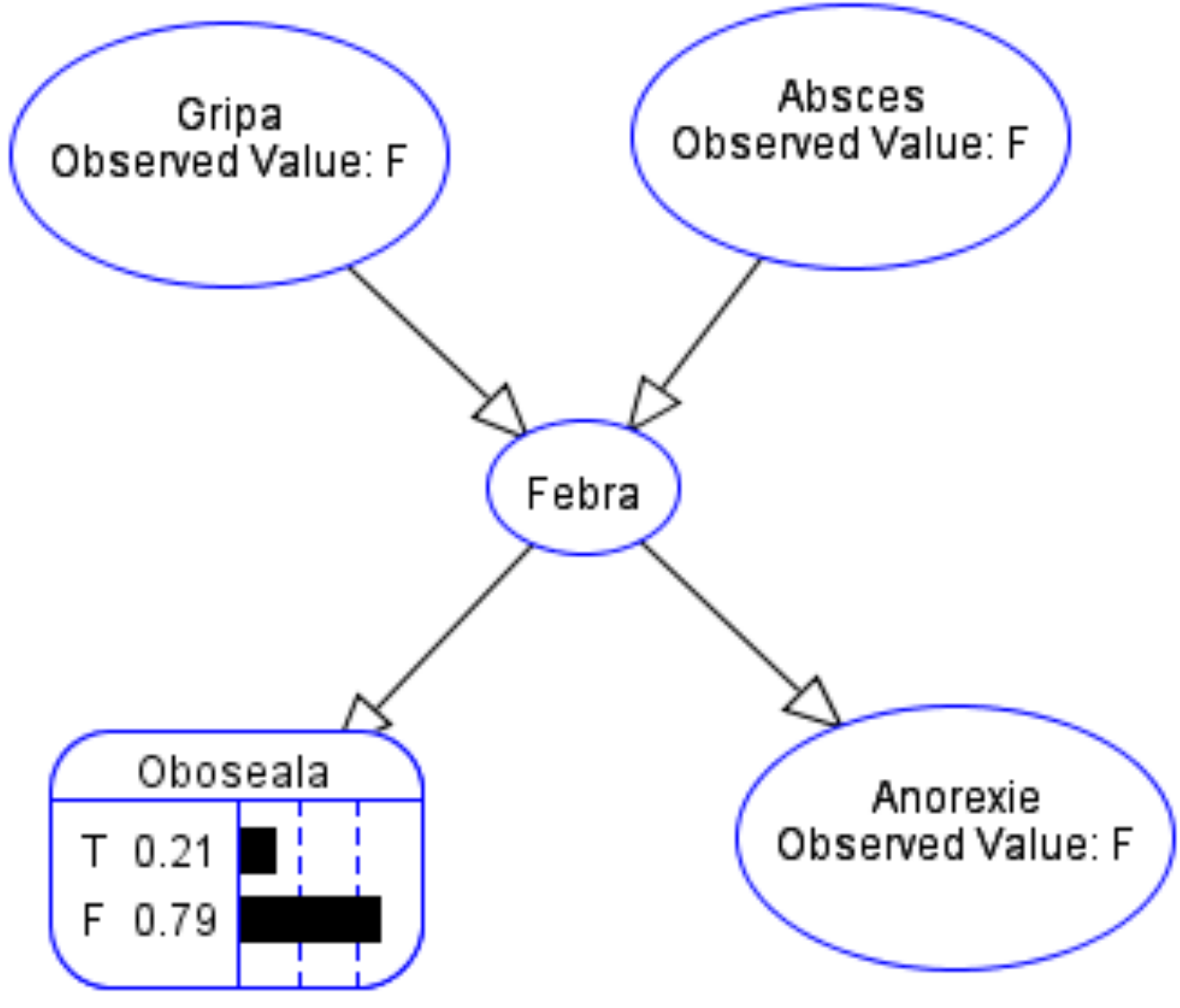
Create Solve

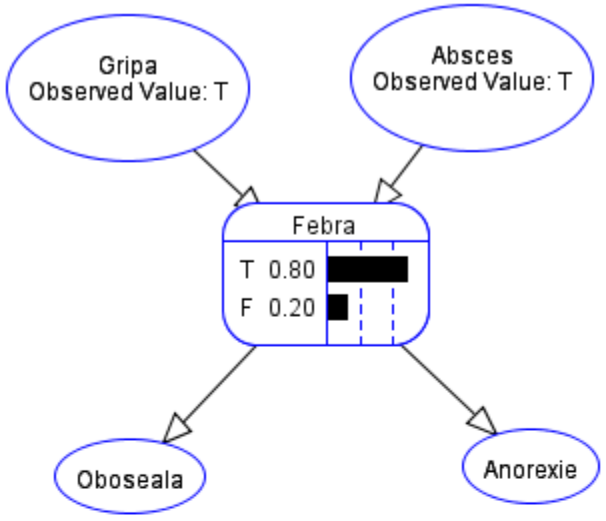
Click on a node to query its probability or utility.



Belief Network Mode

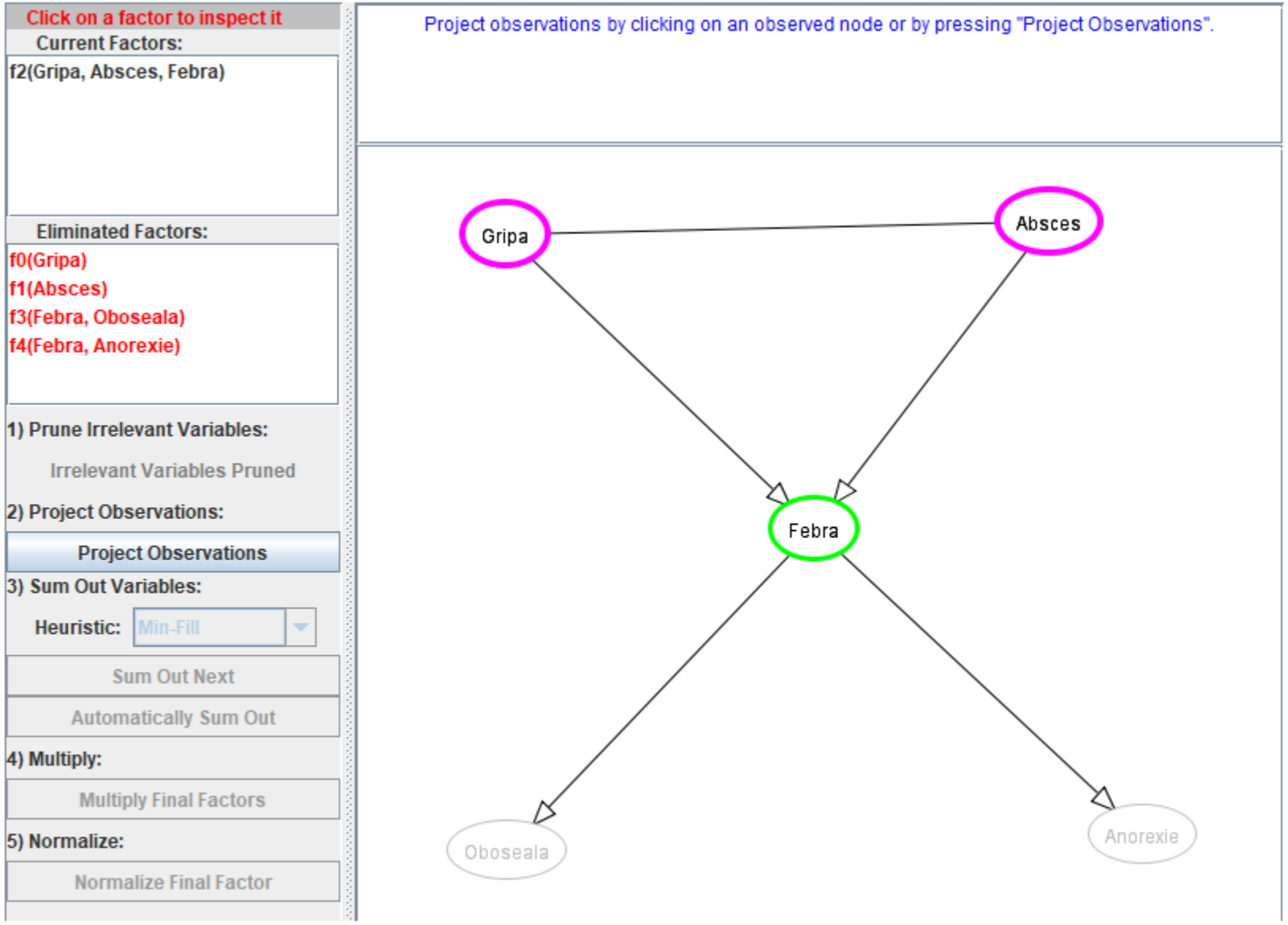
Problema 2


Gripa
Observed Value: F
Absces
Observed Value: F
Febra
Oboseala
T 0.21
F 0.79
Anorexie
Observed Value: F

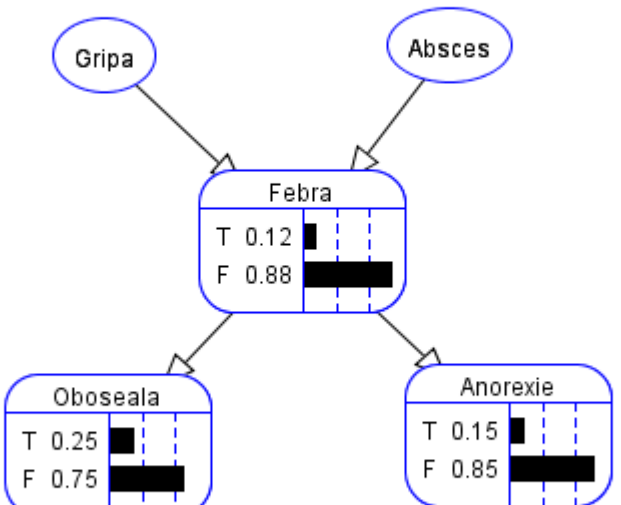


Oboseala si Anorexie nu influenteaza P(f|GD,AD) f apartine {FD,FN} intrucat Oboseala si Anorexie sunt fii a lui Febra,se poate observa ca programul ii elimina

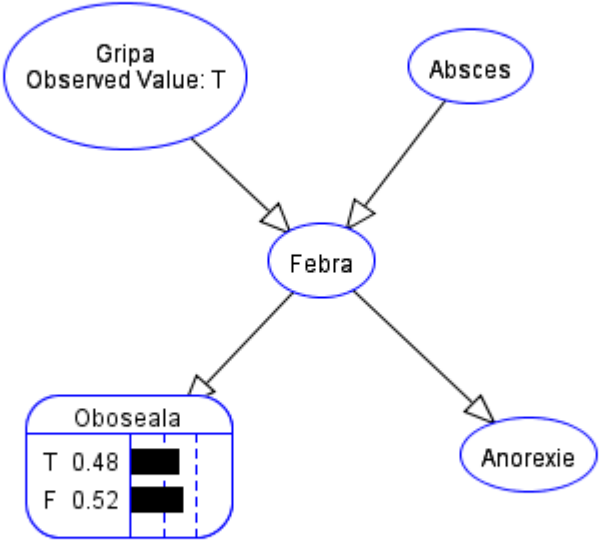
Problema 3,a)



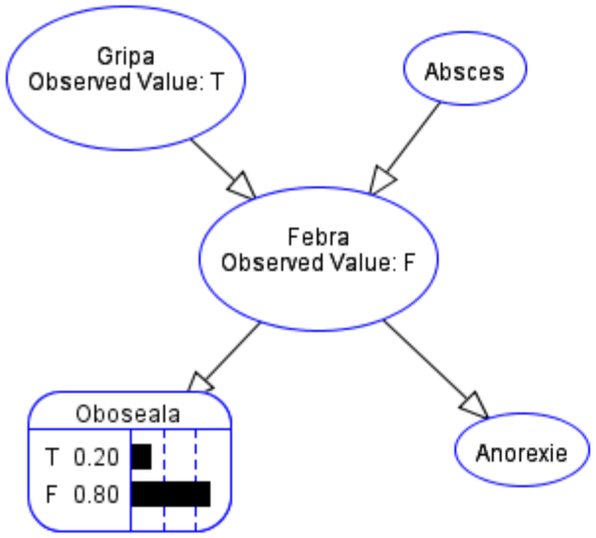
Problema 3,b)


Gripa
Absces
Febra
T 0.12
F 0.88
Oboseala
T 0.25
F 0.75
Anorexie
T 0.15
F 0.85

Problema 3,c)


Gripa
Observed Value: T
Absces
Febra
Oboseala
T 0.48
F 0.52
Anorexie

Problema 3,d)



Click on a factor to inspect it

Current Factors:

f2(Gripa, Absces, Febra)

Eliminated Factors:

f0(Gripa)
f1(Absces)
f3(Febra, Oboseala)
f4(Febra, Anorexie)

1) Prune Irrelevant Variables:

Irrelevant Variables Pruned

2) Project Observations:

Project Observations

3) Sum Out Variables:

Heuristic: Min-Fill

Sum Out Next

Automatically Sum Out

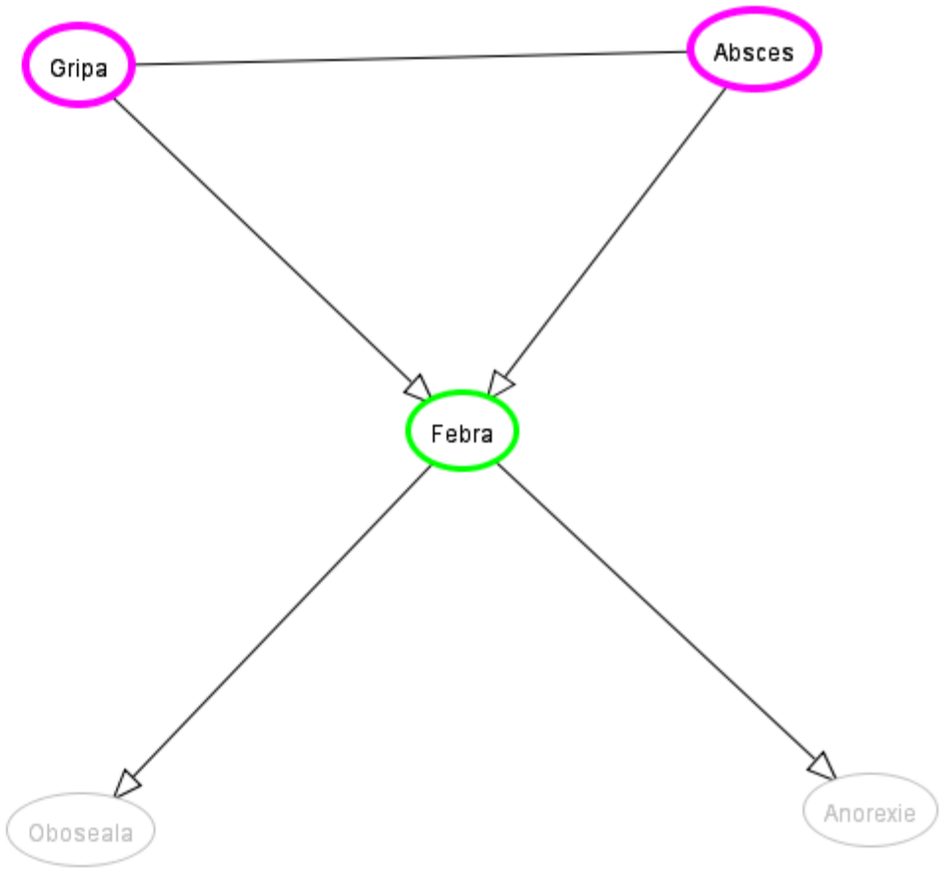
4) Multiply:

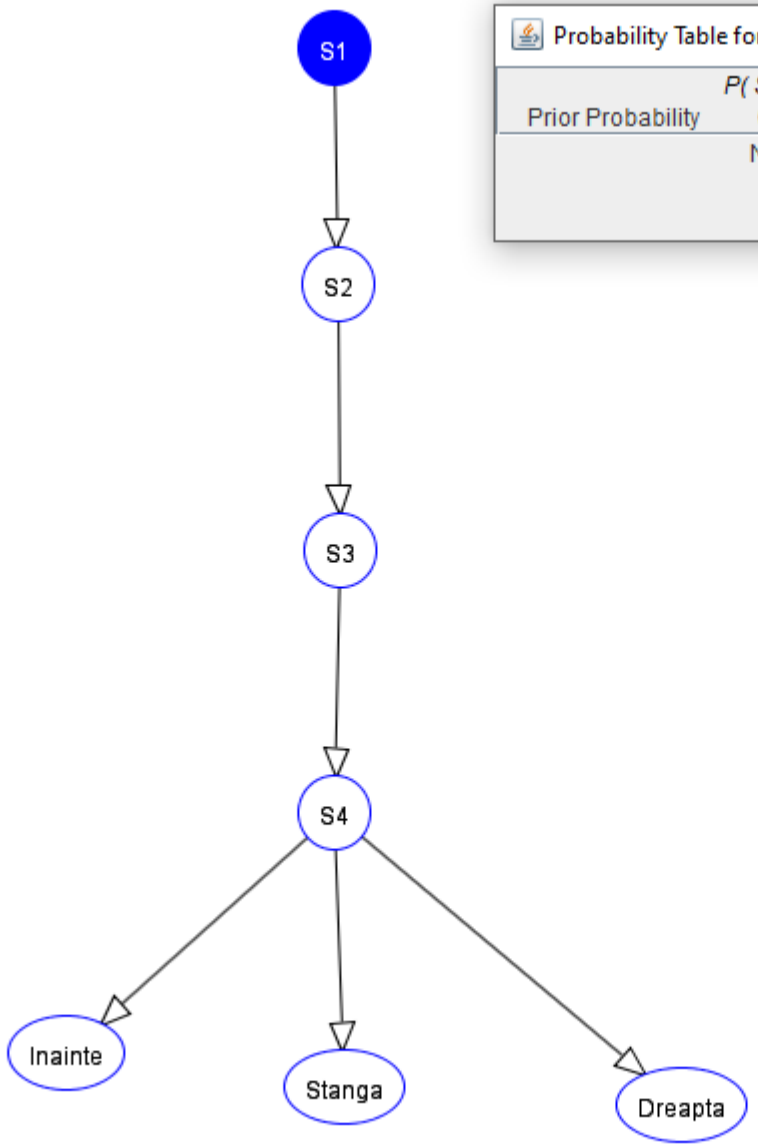
Multiply Final Factors

5) Normalize:

Normalize Final Factor

Project observations by clicking on an observed node or by pressing "Project Observations".



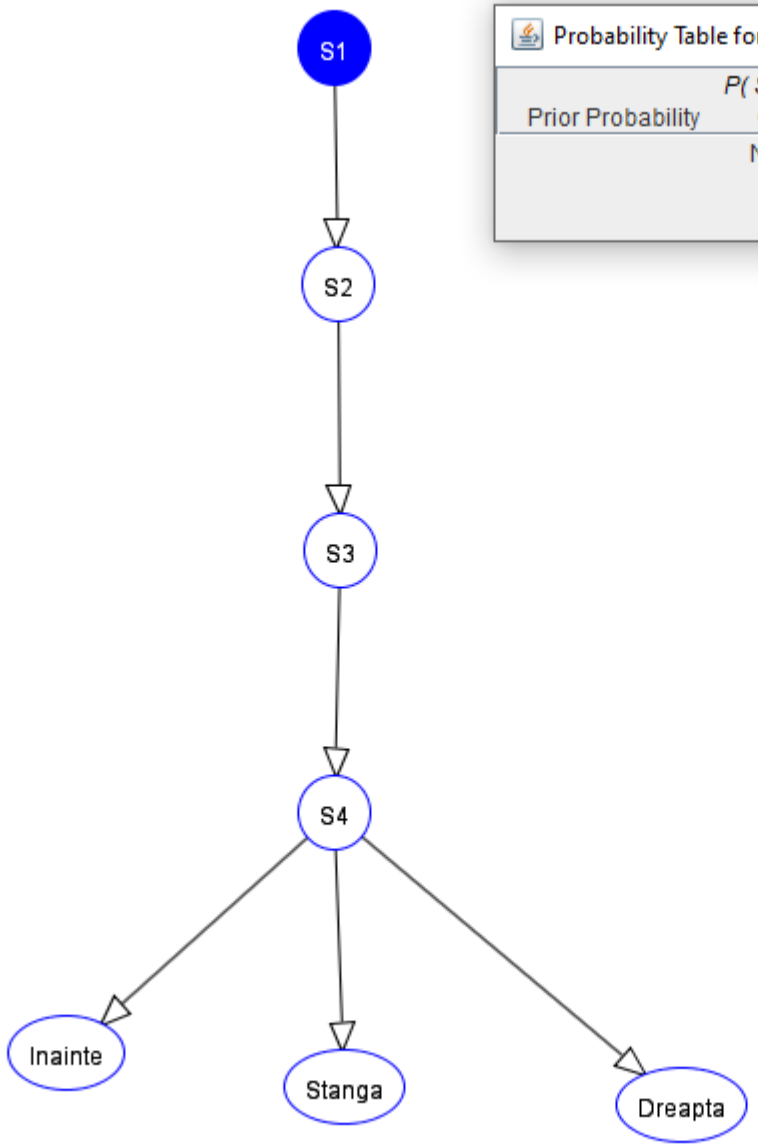


Probability Table for S1

	P(S1=B1)	P(S1=B2)	P(S1=B3)	P(S1=B4)
Prior Probability	0.25	0.25	0.25	0.25

No observed value for this node.

OK

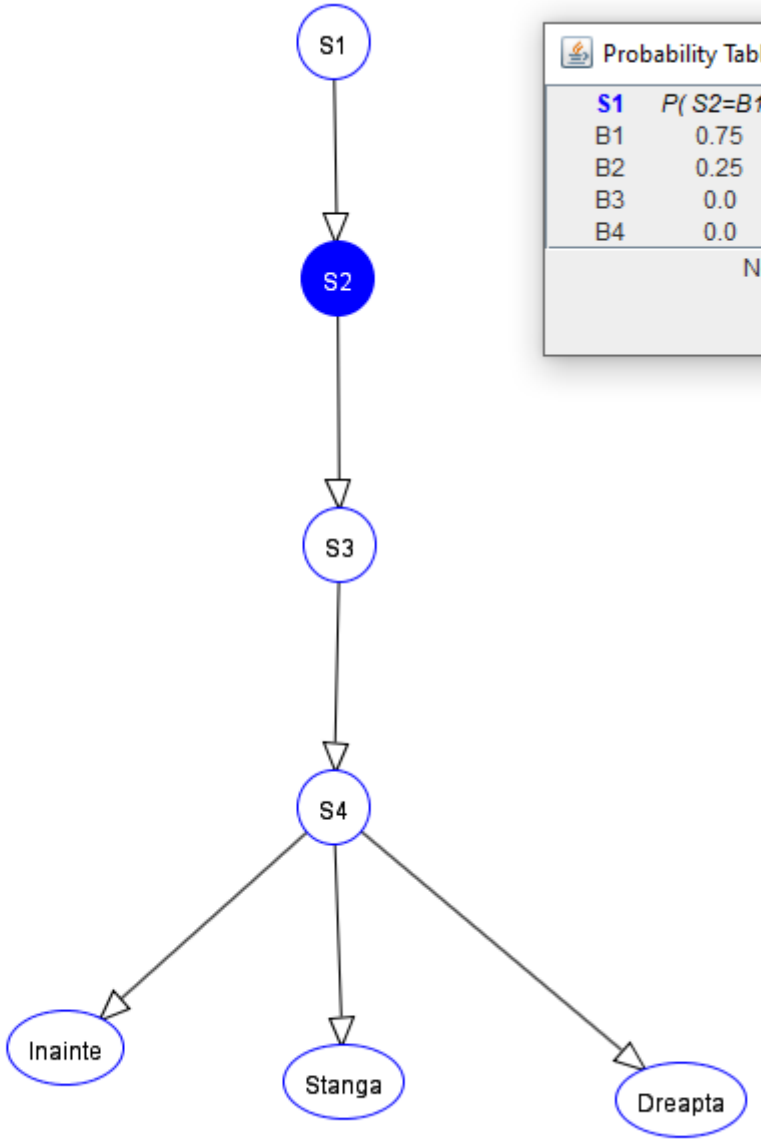


Probability Table for S1

	P(S1=B1)	P(S1=B2)	P(S1=B3)	P(S1=B4)
Prior Probability	0.25	0.25	0.25	0.25

No observed value for this node.

OK

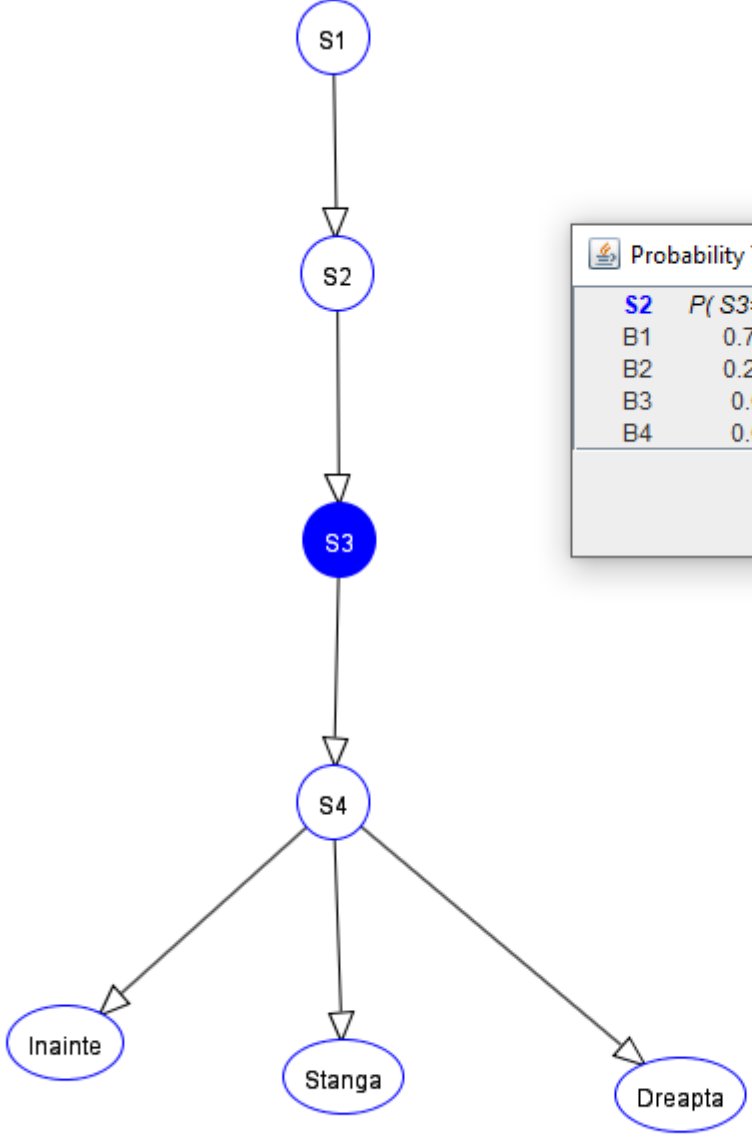


Probability Table for S2

S1	P(S2=B1)	P(S2=B2)	P(S2=B3)	P(S2=B4)
B1	0.75	0.25	0.0	0.0
B2	0.25	0.5	0.25	0.0
B3	0.0	0.25	0.5	0.25
B4	0.0	0.0	0.25	0.75

No observed value for this node.

OK

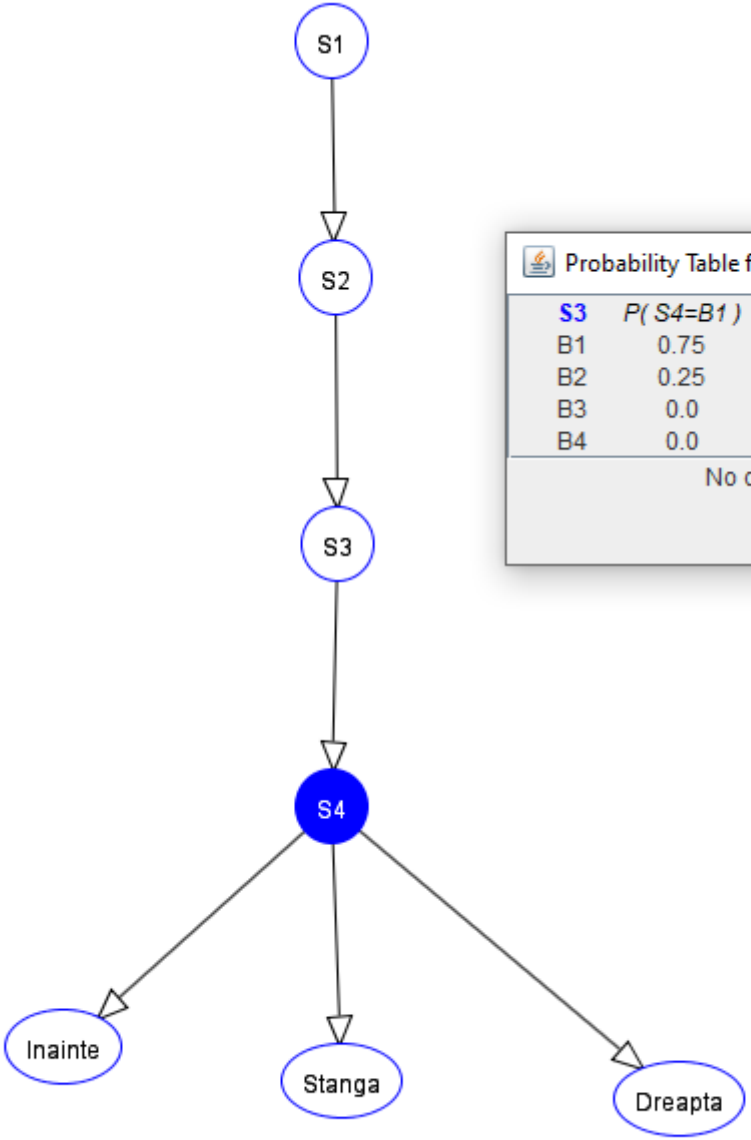


Probability Table for S3

S2	P(S3=B1)	P(S3=B2)	P(S3=B3)	P(S3=B4)
B1	0.75	0.25	0.0	0.0
B2	0.25	0.5	0.25	0.0
B3	0.0	0.25	0.5	0.25
B4	0.0	0.0	0.25	0.75

No observed value for this node.

OK

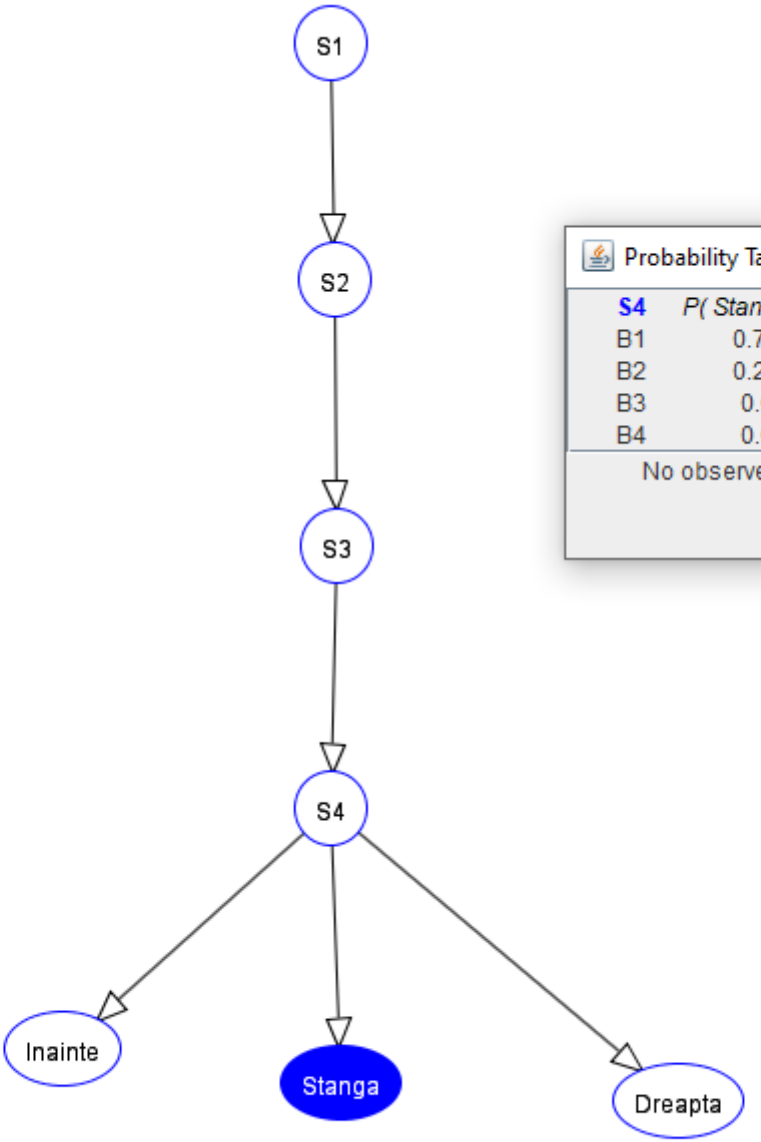


Probability Table for S4

S3	P(S4=B1)	P(S4=B2)	P(S4=B3)	P(S4=B4)
B1	0.75	0.25	0.0	0.0
B2	0.25	0.5	0.25	0.0
B3	0.0	0.25	0.5	0.25
B4	0.0	0.0	0.75	0.25

No observed value for this node.

OK

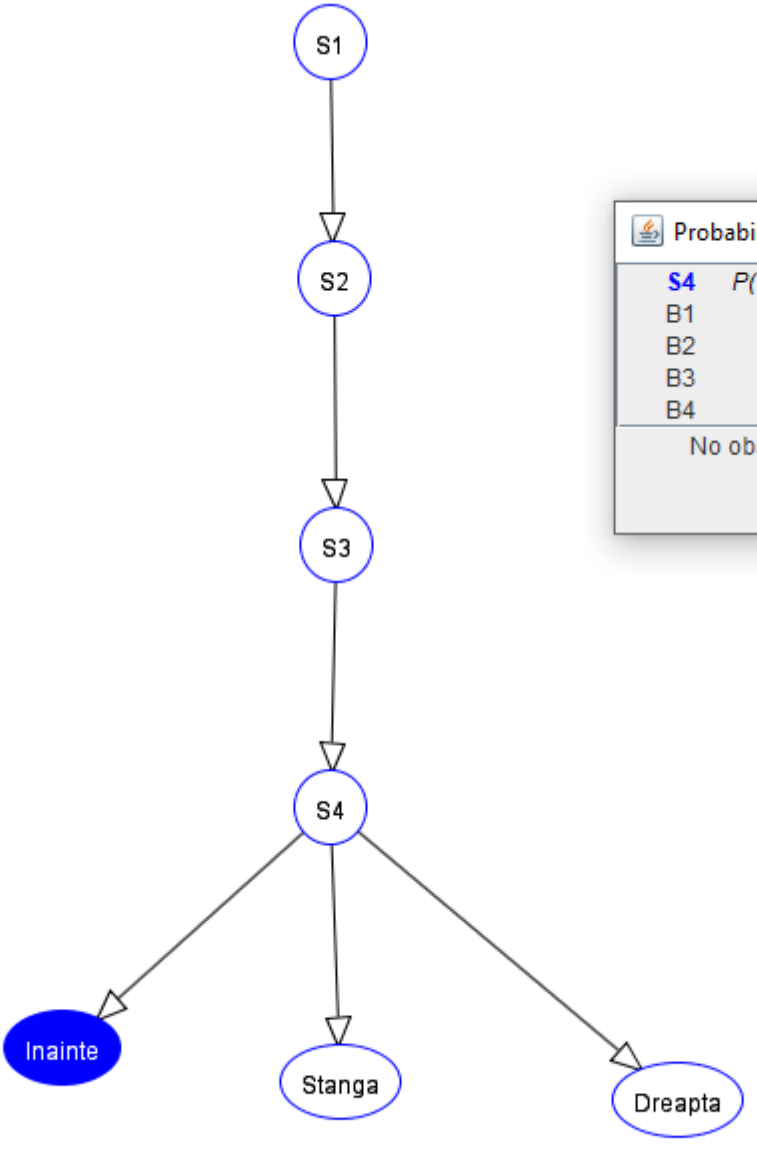


Probability Table for Stanga

S4	P(Stanga=T)	P(Stanga=F)
B1	0.75	0.25
B2	0.25	0.75
B3	0.0	1.0
B4	0.0	1.0

No observed value for this node.

OK

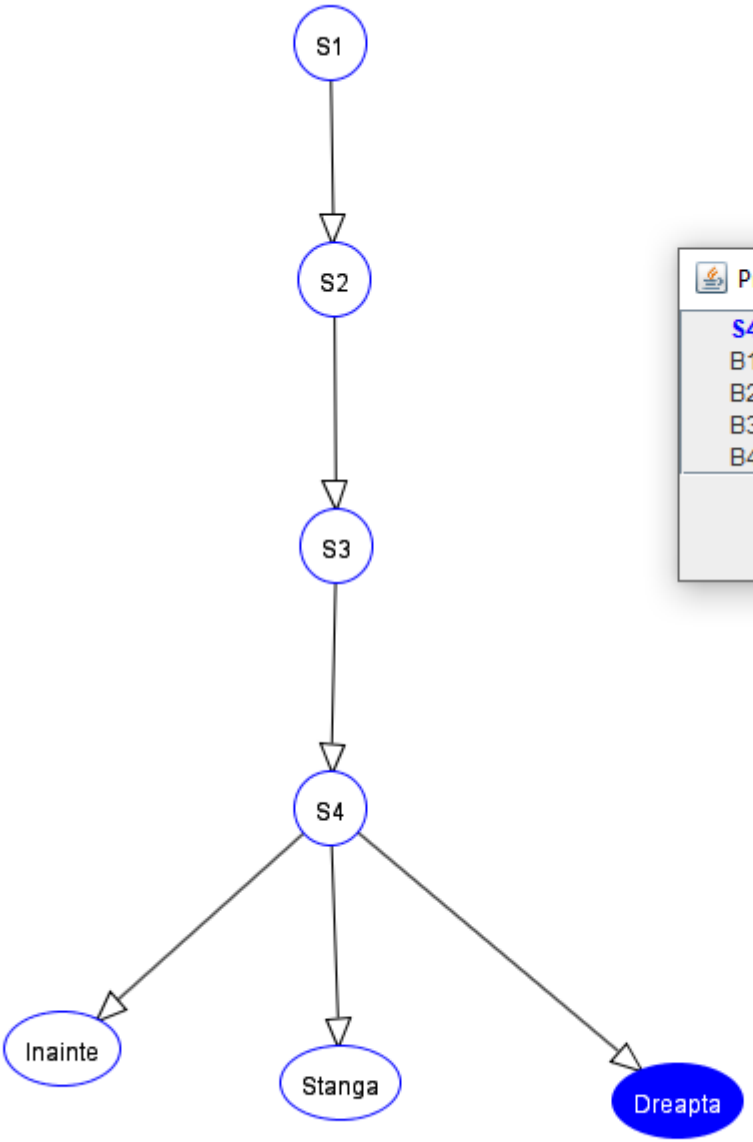


Probability Table for Inainte

S4	P(Inainte=T)	P(Inainte=F)
B1	0.25	0.75
B2	0.75	0.25
B3	0.75	0.25
B4	0.25	0.75

No observed value for this node.

OK



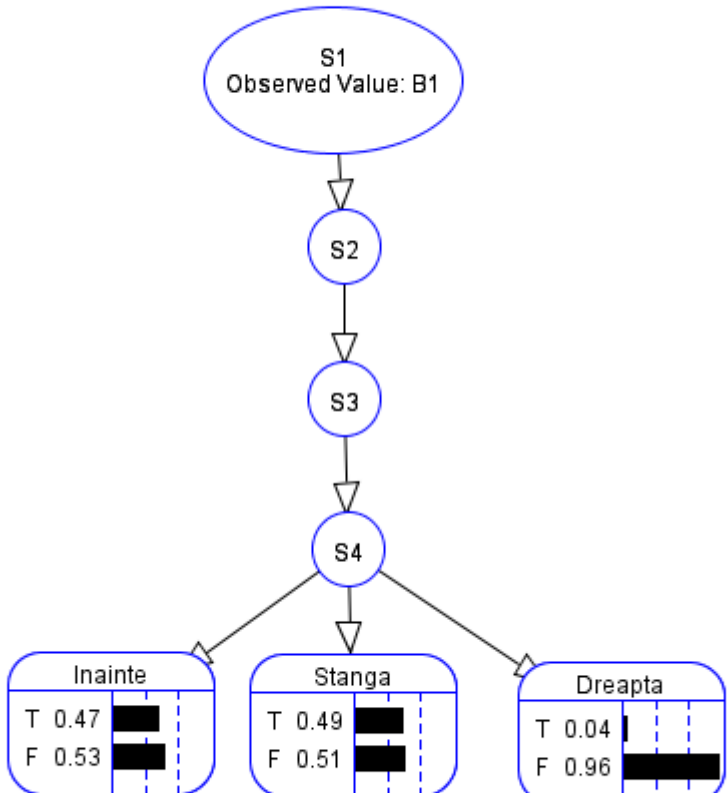
Probability Table for Dreapta

S4	P(Dreapta=T)	P(Dreapta=F)
B1	0.0	1.0
B2	0.0	1.0
B3	0.25	0.75
B4	0.75	0.25

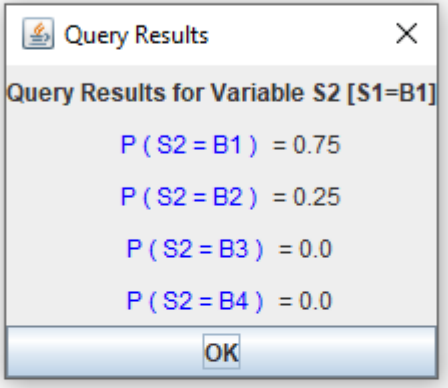
No observed value for this node.

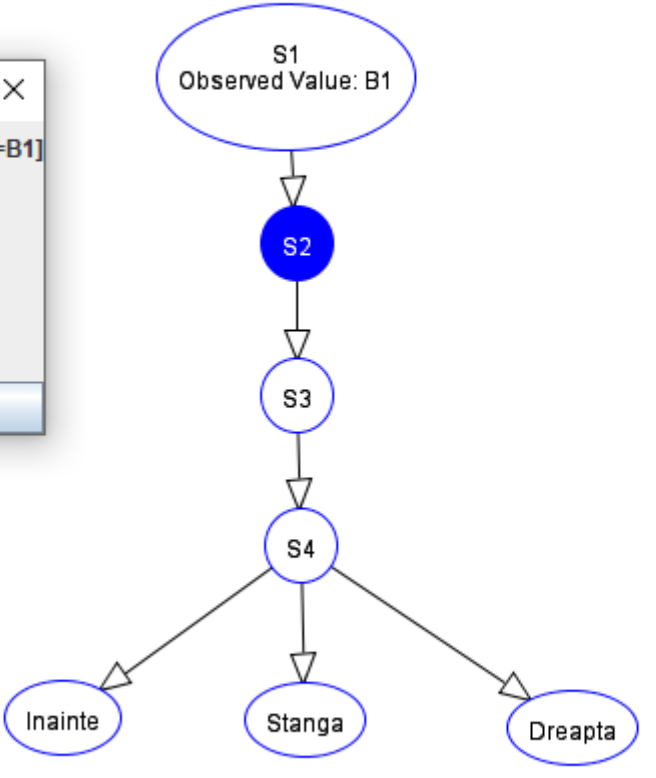
OK

Problema 4,a)

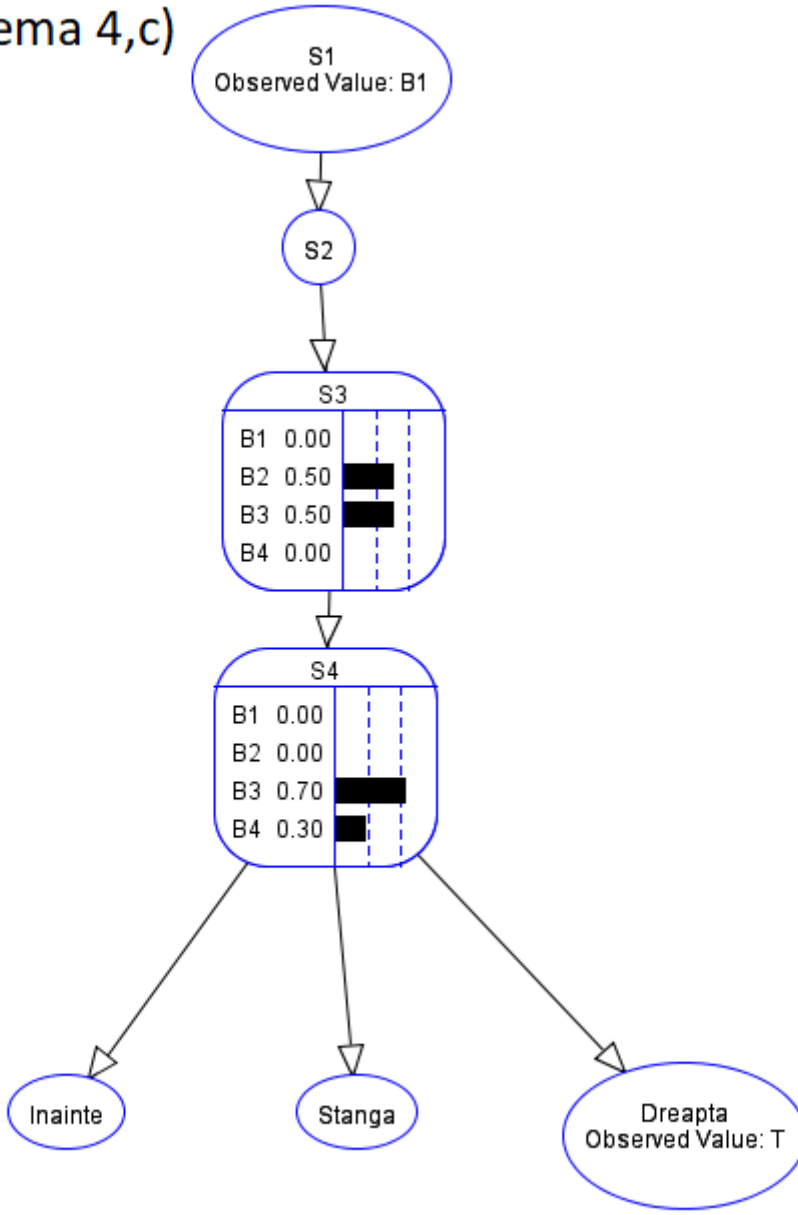

S1
Observed Value: B1
S2
S3
S4
Inainte
T 0.47
F 0.53
Stanga
T 0.49
F 0.51
Dreapta
T 0.04
F 0.96

Problema 4,b)

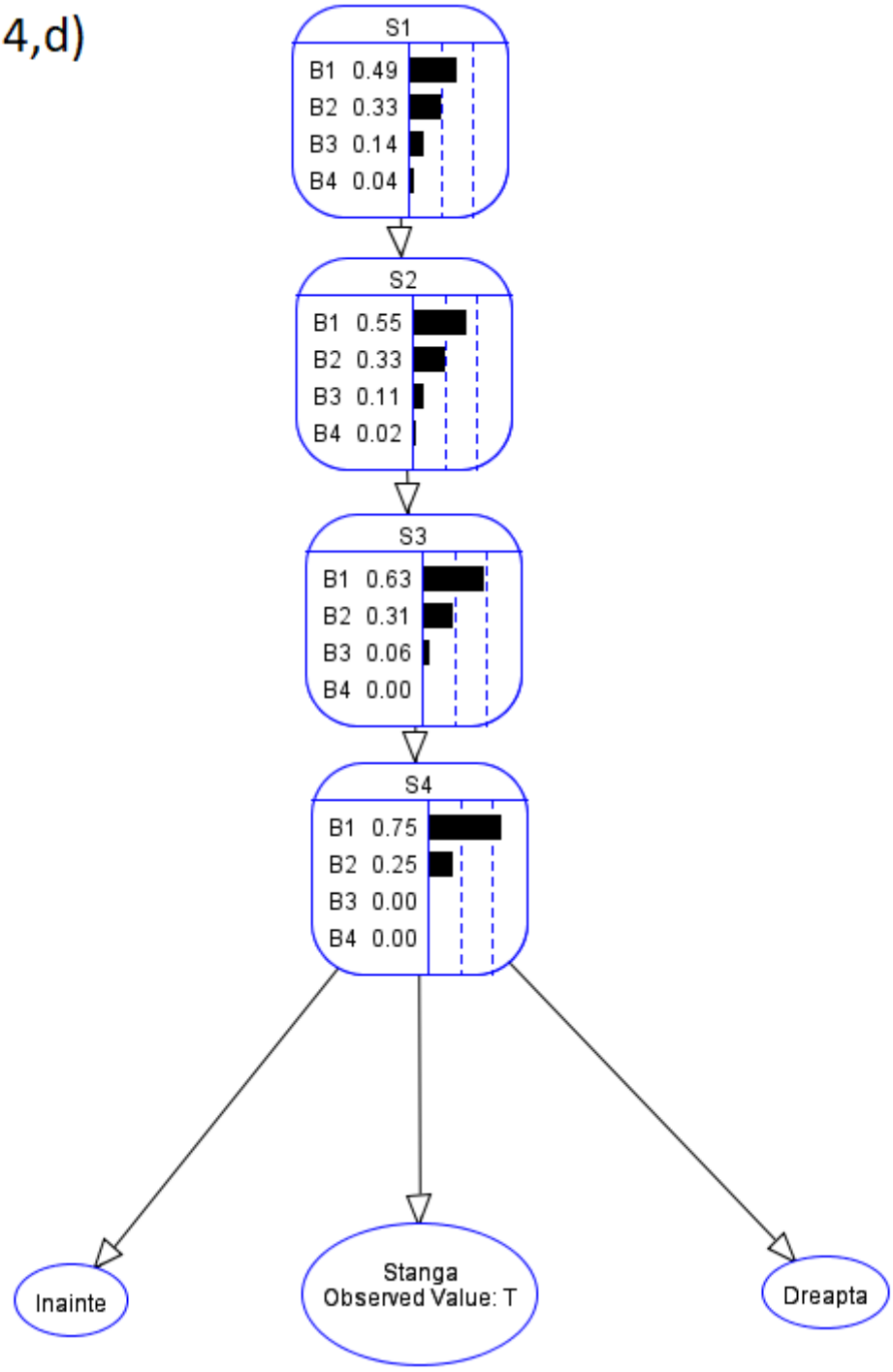

Query Results
Query Results for Variable S2 [S1=B1]
P (S2 = B1) = 0.75
P (S2 = B2) = 0.25
P (S2 = B3) = 0.0
P (S2 = B4) = 0.0
OK


S1
Observed Value: B1
S2
S3
S4
Inainte
Stanga
Dreapta

Problema 4,c)


S1
Observed Value: B1
S2
S3
B1 0.00
B2 0.50
B3 0.50
B4 0.00
S4
B1 0.00
B2 0.00
B3 0.70
B4 0.30
Inainte
Stanga
Dreapta
Observed Value: T

Problema 4,d)


S1
B1 0.49
B2 0.33
B3 0.14
B4 0.04
S2
B1 0.55
B2 0.33
B3 0.11
B4 0.02
S3
B1 0.63
B2 0.31
B3 0.06
B4 0.00
S4
B1 0.75
B2 0.25
B3 0.00
B4 0.00
Inainte
Stanga
Observed Value: T
Dreapta