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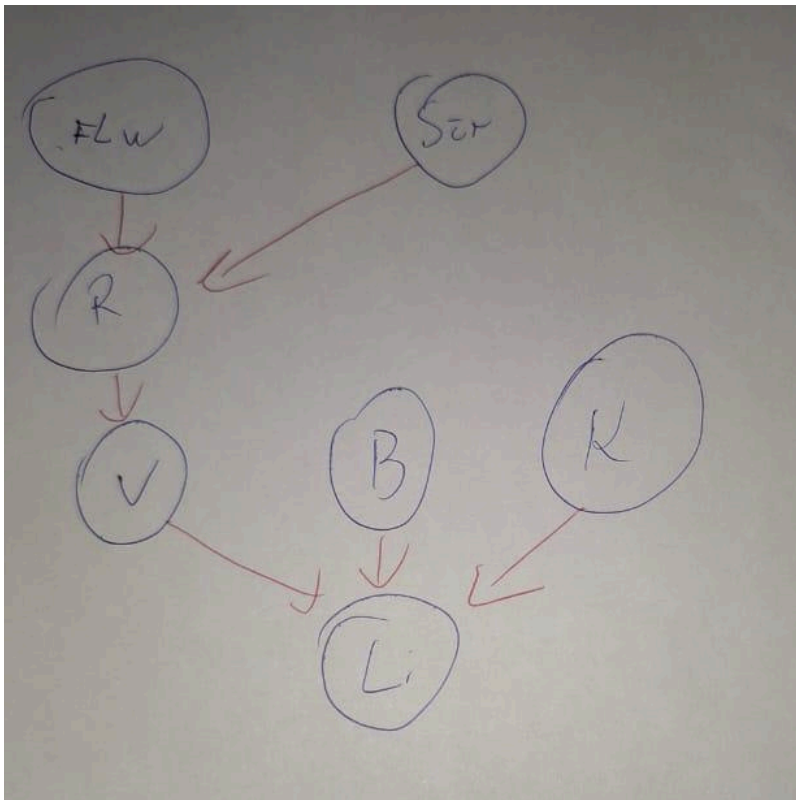
1) **Questão**
   a)



CTP flw

P(flw)
0.1

CTP str

	P(str)
dry	0.7
wet	0.2
snow_covered	0.1

CTP R

	P(R) - dry, wet, snow_covered
fwl(V)	(0.5, 0.8, 0.95)
fwl(F)	(0.05, 0.2, 0.5)

CTP V

R	P(V)
V	0,2
F	0.99

CTP K

P(K)
0.95

CTP B

P(K)
0.95

CTP Li

V	B	K	P(Li)
t	t	t	0,99
t	t	f	0,01
t	f	t	0,01
t	f	f	0,001
f	t	t	0,3
f	t	f	0,005
f	f	t	0,005
f	f	f	0

d)
Como Li é condicionalmente independente de R dado V, e V é condicionalmente independente de str dado R, podemos concluir que Li é condicionalmente independente de str dado V.

e)
Calculando P(R = t | str = snow_covered):

- P(R = t | Flw = t, Str = snow_covered) = 0,95
- P(R = t | Flw = f, Str = snow_covered) = 0,5

Usando a lei total de probabilidade:
P(R = t | Str = snow_covered) = P(R = t | Flw = t, Str = snow_covered) * P(Flw = t) + P(R = t | Flw = f, Str = snow_covered) * P(Flw = f)

P(R = t | Str = snow_covered) = (0,95 * 0,1) + (0,5 * 0,9) = 0,095 + 0,45 = 0,545

Calculando P(V = t | Str = snow_covered):

P(V = t | Str = snow_covered) = P(V = t | R = t) * P(R = t | Str = snow_covered) + P(V = t | R = f) * P(R = f | Str = snow_covered)

P(V = t | Str = snow_covered) = (0,2 * 0,545) + (0,99 * 0,455) = 0,109 + 0,45045 = 0,55945

P(V = t | Str = snow_covered) =0,55945

2)
Link github: https://github.com/rivailluz/ufam_ia/blob/main/2_trabalho/atv.pl
Link problog:
https://dtai.cs.kuleuven.be/static/problog/editor.html#task=prob&hash=5bc8e08a8d4c74e9c07ec1365983dccb

Editor

```
% Your model here

0.1 :: flw .
0.7::str(dry); 0.2::str(wet); 0.1::str(snow_covered).

0.5::r :-   flw, str(dry).
0.8::r :-   flw, str(wet).
0.95::r :-   flw, str(snow_covered).
0.05::r :- \+flw, str(dry).
0.2::r :- \+flw, str(wet).
0.5::r :- \+flw, str(snow_covered).

0.2::v :- r.
0.99::v :- \+r.

0.95 :: b .
0.95 :: k .

0.99::li :- v, b, k.
0.01::li :- v, b, \+k.
0.01::li :- v, \+b, k.
0.001::li :- v, \+b, \+k.
0.3::li :- \+v, b, k.
0.005::li :- \+v, b, \+k.
0.005::li :- \+v, \+b, k.
%0.99::li :- \+v, \+b, \+k.

evidence(str(snow_covered),true).

query(v).
```

Inference

Evaluate

Query ▾	Location	Probability
v	30:7	0.55945

Link to model