AIS (Artificial Intelligence Systems) 08 Nov 2021.

CSP
Planning
Bayes Net
MDP & RL
Fuzzy logic
Neural Network (Basic)

Problem on Bayes Net:
Problem Context
A musician asks you to help him compose the next big Bollywood hit for the upcoming awards season. He uses his knowledge of the Indian music industry to create a probability table with six (6) boolean variables, but he needs your assistance in analyzing the table.

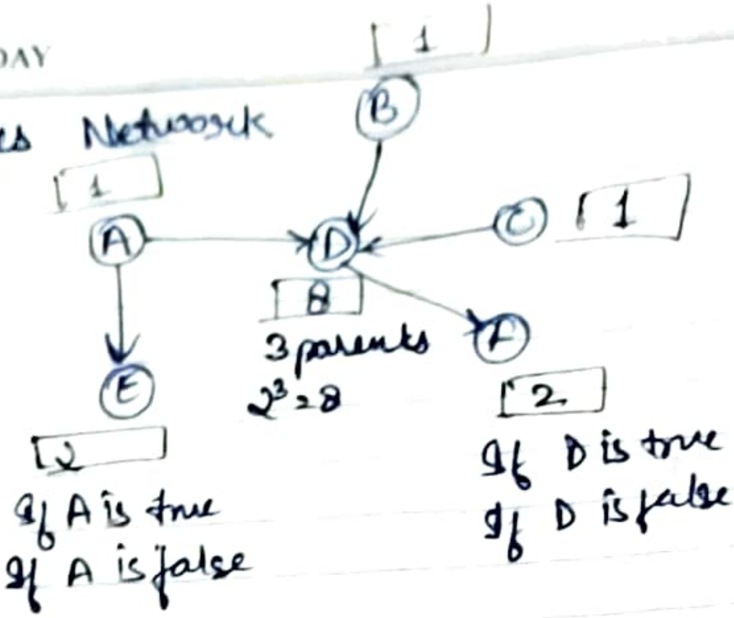
Without making any assumptions about independ how many parameters do we need in the joint probability table?

Six variables
A, B, C, D, E, F

A	B	C	D	E	F	Outcome
NOTES T	T	F	F	T	T	0.2
						.
						.
						0.1

$2^6 - 1$ = 1

Bayes Network



True or false. Justify

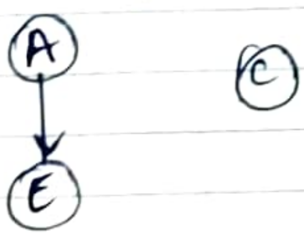
P(A|CE) = P(A|E)

P we are dropping C b/c A is conditionally independent of C given E.

P(A|CE)

d-separation algo. approach

1) Ancestral graph :- All variables are present.



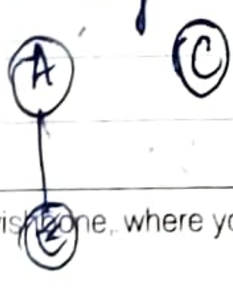
② If find out if there is any common children in the graph.

NOTES

march '20

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4			
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

③ Disconnect edges



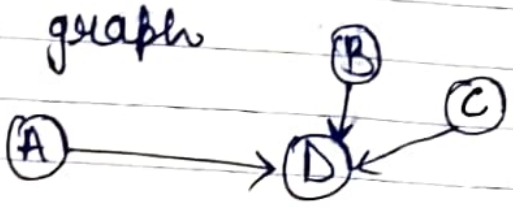
SATURDAY 07

④ Delete the given node. (A) (C)

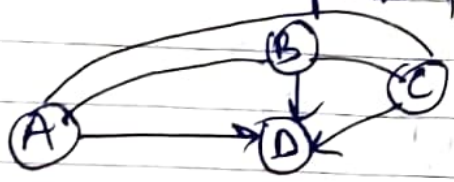
⑤ check whether there is any path b/w A and C
not → no path → not dependent

True or False. Justify
A and D are marginally independent
A and D are marginally independent if knowing the value of A gives no info. → D.

① Ancestral graph

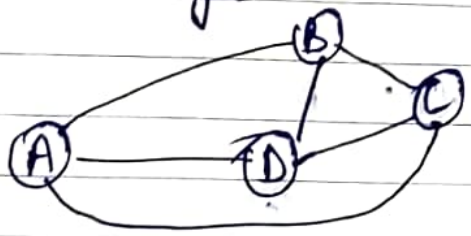


② Common children in ancestral graph
If yes add a link for parents



SUNDAY 08

③ Disorient edges



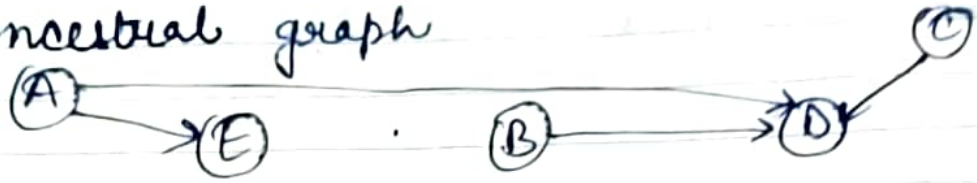
④ Check whether there is a path A and D

not marginally independent

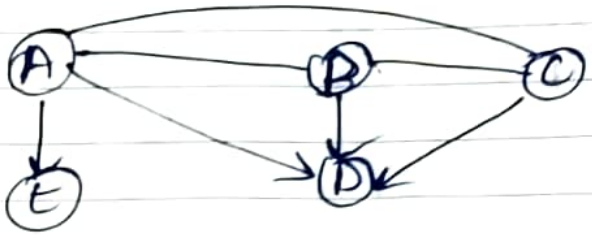
NOTES

True or False. Justify
E and B are conditionally independent, given D.

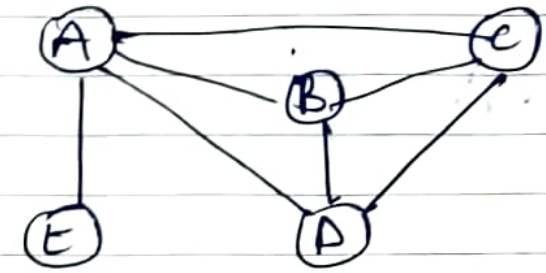
Ancestral graph



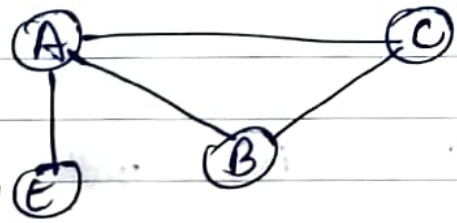
Common children : D



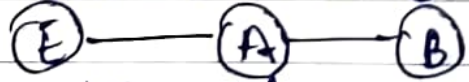
Disorient edges



Delete given node: D



Check path blw E and B?

Yes 

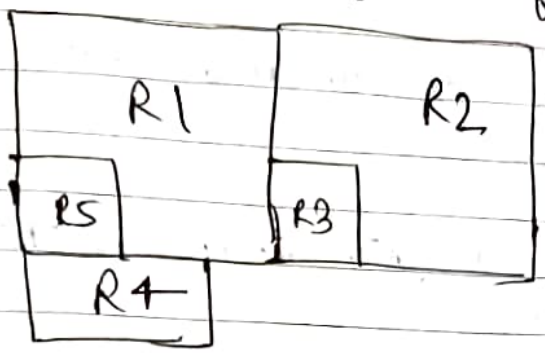
not conditionally independent

false

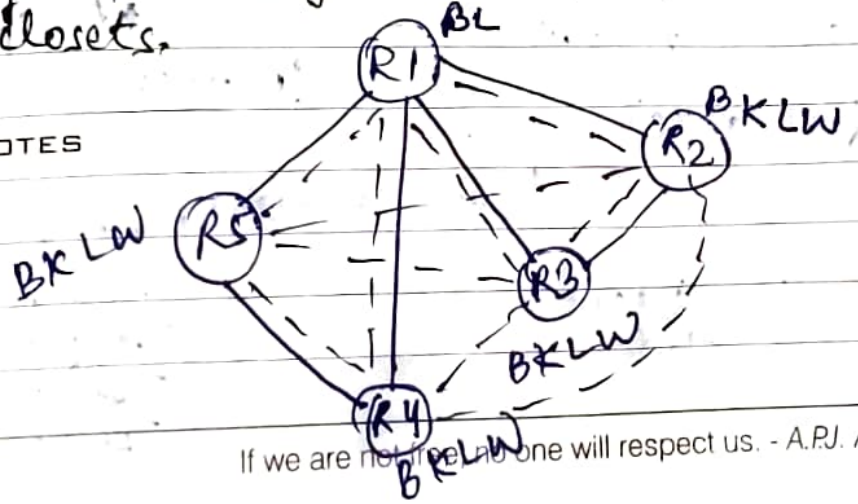
Problem on CSP (Constraint Satisfaction Prob.)

TUESDAY 10

You are an interior designer hired by a luxury hotel to design a new VIP suite. The suite includes five rooms labelled R1 through R5, each needing a specific fn assignment: Bedroom, Living Area, Kitchen, Dining Room or Water Closet (Restrooms). Your task is to designate the best fn for each room based on client's needs and preferences. Here is the suite's floorplan with each room labeled for your reference.



The requirements are-
1 Bedroom, 1 kitchen, 1 Living Room, 2 Water Close
R1 must be either bedroom or living Room
(bcoz the corner of the suite has the best view)
Adjacent rooms must NOT have the same fn
eg. two adjacent rooms can't be water closets.



NOTES

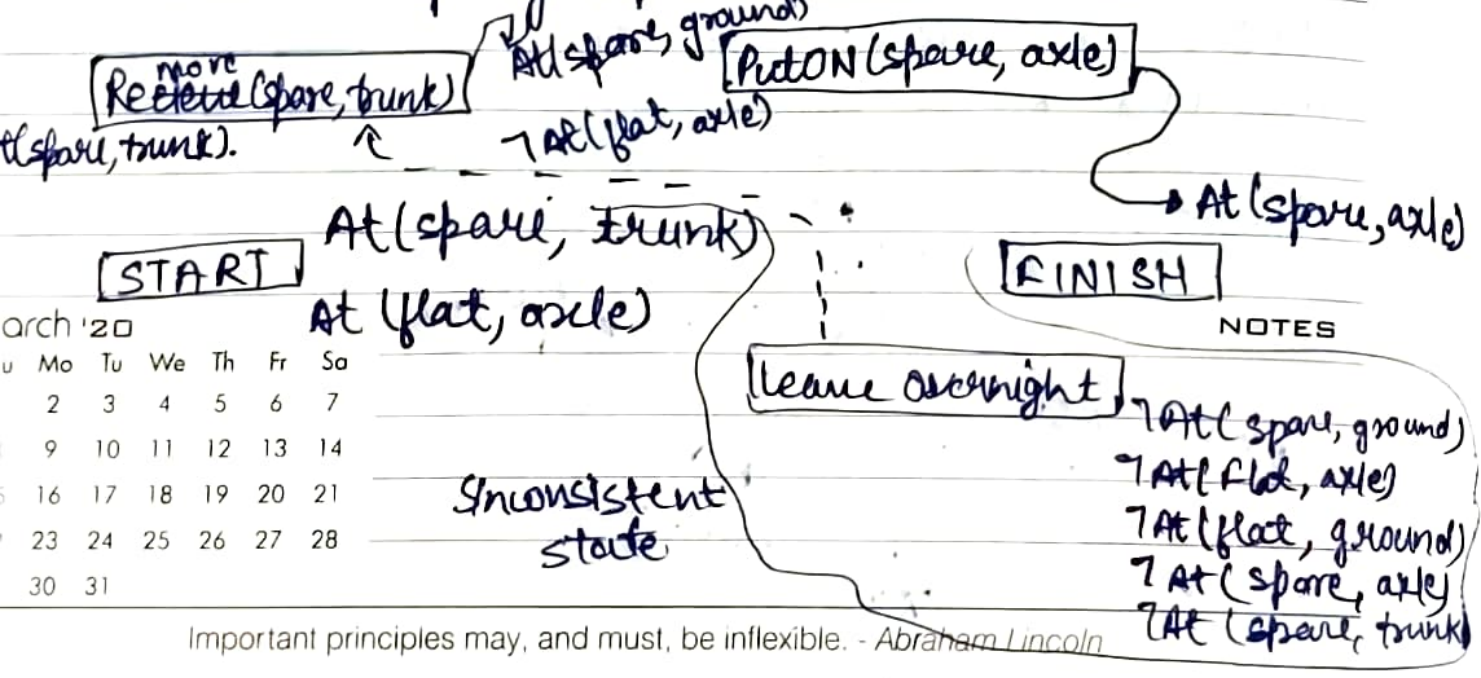
Variable assigned or dequeue	list of all values just eliminated from neighbouring variables	Backtrack
R1 = B	R2, R3, R4, R5 ≠ B	N
R2 = K	R3, R4, R5 ≠ K	N
R3 = L	R4, R5 ≠ L	N
R4 = W	R5 ≠ W	Y
R5 = W	~~R4, R5~~ None	N
R4 = L	R5 ≠ L	N
R5 = W	None	N

DFS + Valid Domain value

Planning

Goal:- To replace a flat tire on the car axle with a spare tire.

- Derive the plan using partial order planning algorithm and show step by step solution
- Derive the plan using GraphPlan algorithm. Show step by step solution.



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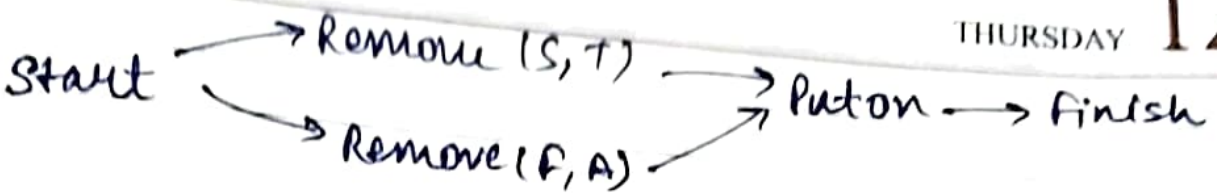
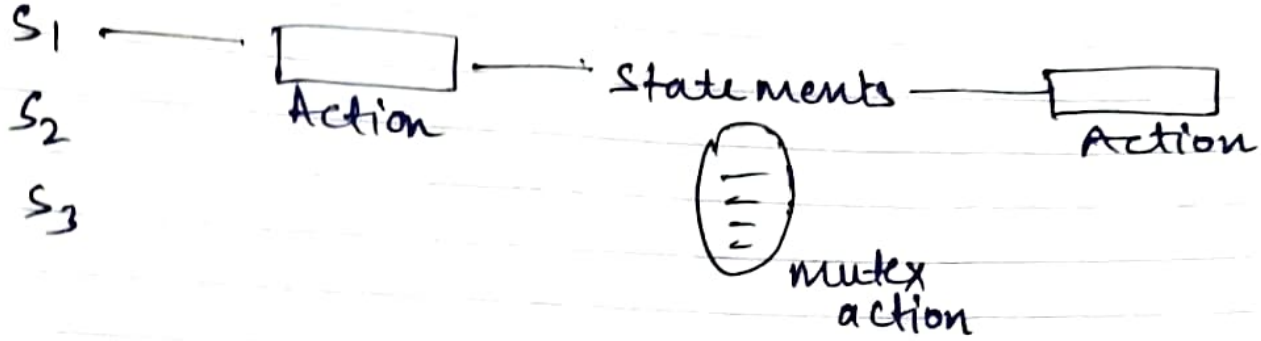


Prel Literals



Graph Plan

S_0

	Action	S_1
At(spare, trunk)	Remove(spare, trunk)	¬At(spare, trunk)
At(flat, axle)	Remove(flat, axle)	
¬At(spare, axle)		
¬At(Flat, ground)	Leaveon	
¬At(spare, ground)	Plan	

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