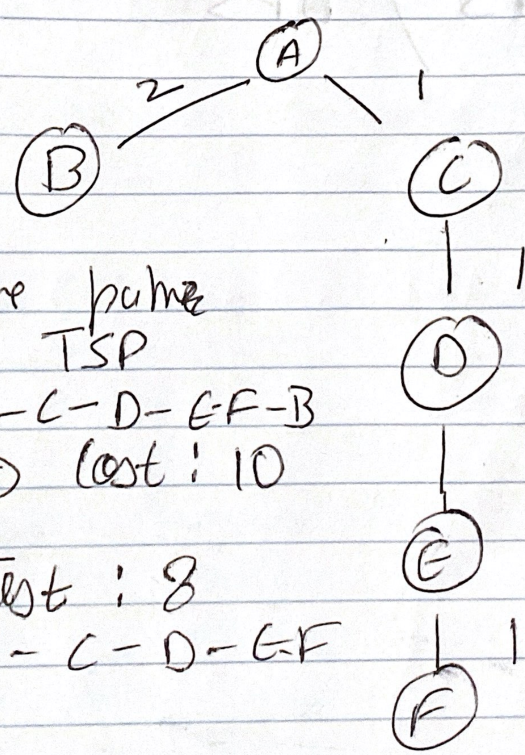
7/

4) Travelling saloman problem is a greedy algorithm which always ~~the~~ chooses the path with the minimum cost. This is a very effective and efficient algorithm.

But, In some scenario's TSP is not the best choise

For example



In the pahe
Via TSP
⇒ A–C–D–EF–B
⇒ Cost : 10

Fastest : 8
A–B–C–D–EF

TSP will choose greedy algorithm and visit ~~B~~ C first due to less cost but going to B is better

Another Heuristic for the problem

-> Trying to show my specific graph will immediately help us pick the other option

-> BFS / DFS

7 goal driven vs data driven

(a) goal driven ⇒ Because we know there is a problem but don't know what's the problem

(b) data driven ⇒ Because we have the data of common Ancestor to work with

(c) goal driven ⇒ Because we dont know the common Acenstor

(d) goal driven ⇒ theorems are proved with a set goal

(e) Data driven ⇒ Because probability is used whic comes from data

(f) data driven ⇒ AI models are trained with data and not goals

10 For data driven →

~~Rules~~ Facts that we know

- collie (fred)

binds

$\forall X (spanel(X) \vee (collie(X) \wedge trained(X)) \rightarrow good\ dog(X))$

- master (fred , Sam)

⟹

$\forall (X, Y, Z)\ [goodog(X) \wedge master(X, Y) \wedge location(Y, Z) \rightarrow location(X, Z)$

- day (saturday) and

¬ (warm (saturday))

implies

location

(sam, museum)

- trained (fred) & collie (fred)
Implies

$\forall X$ (spanel $(X) \vee$ (collie $(X) \wedge$
trained))
$\rightarrow$ gooddog (x)

$\rightarrow$ All these facts relative
to the rule 7

$\forall (X,Y,Z)$ [gooddog $(X) \wedge$ master (X,Y)
$\wedge$ location (Y,Z)
$\rightarrow$ location (X,Z)

2

5 State space

A (I) _ W W W B B B
(II) W _ W W B B B
(III) W W _ W B B B
(IV) W W W _ B B B

(V) W W W B _ B B
(VI) W W W B B _ B
(VII) W W W B B B _

B heuristic that can be used to solve this problem are

- BFS
- counting tiles

BFS => admissable, monotonic, uninformed

counting tiles -> admissable, non monotonic more informed

6
=

(a) Start

2	8	3
1	6	4
	7	5

2	8	3
1	6	4
7		5

2	8	3
1		4
7	6	5

2		3
1	8	4
7	6	5

	2	3
1	8	4
7	6	5

1	2	3
	8	4
7	6	5

1	2	3
8		4
7	6	5

Cost: 6

b)

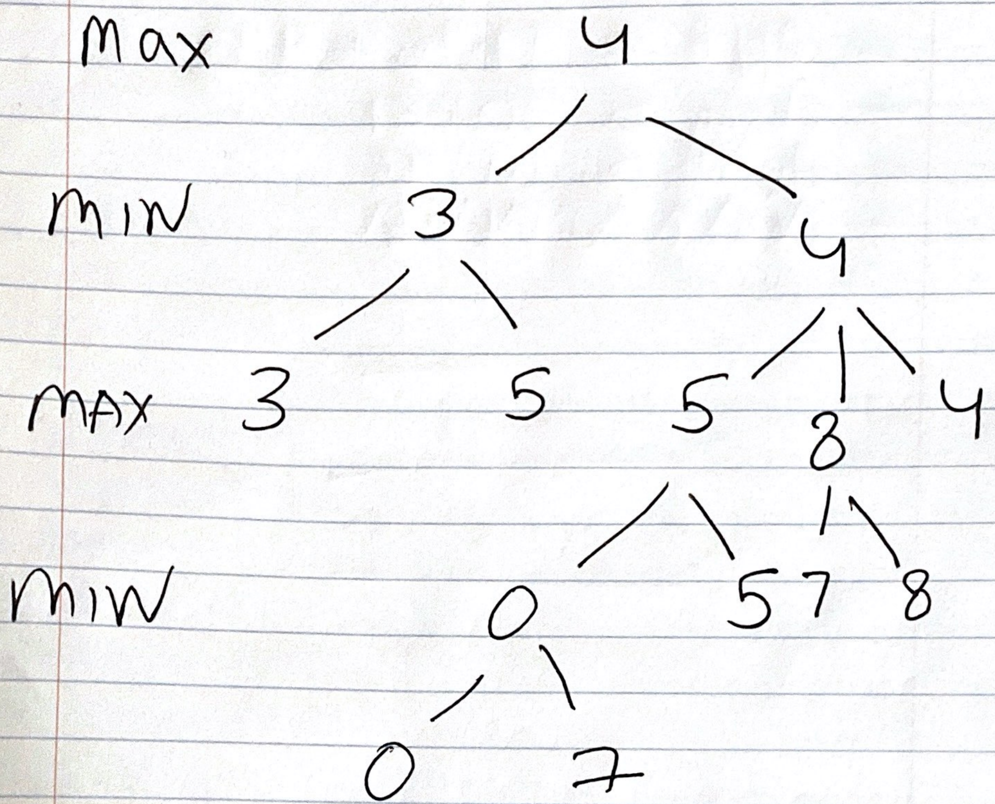
2	8	1
	4	3
7	6	5

prunes the state space
most effectively

c) start and goal states
are monotonic

d) Considering Admissable Heuristic
the goal state represents
$h^*(N)$
if ($h(N) \leq h^*(N) \geq 0$)

13



Number	Major	Co-op	Year	Grade	
1	CS	YES	1st	A	+
2	EE	NO	1st	C	−
3	CS	NO	2nd	A	+
4	MATH	YES	3rd	A	−
5	CS	YES	3rd	C	−

---

1 ⇒ $S_0 = \{ \phi, \phi, \phi, \phi \}$

$G_0 = \{ ?, ?, ?, ? \}$

$S_1 = \{$ CS, YES, 1st, A $\}$

$G_1 = \{ ?, ?, ?, ? \}$

2 ⇒ $S_2 = \{$ CS, YES, 1st, A $\}$

$G_2 = \{$ <'CS', '?', '?', '?'>,

<'?', 'YES', '?', '?'>,

<'?, '?', '?', 'A'> $\}$

$3 \Rightarrow S_3 = \{\text{'CS', '?', '?', 'A'}\}$

$G_3 = \{\langle \text{'CS', '?', '?', '?'} \rangle,$

$\langle \text{'?', '?', '?', 'A'} \rangle\}$

$4 \Rightarrow \cancel{S_4 = \{\text{'CS', 'A'}}$

$S_4 = \{\text{'CS', '?', '?', 'A'}\}$

$G_4 = \{\langle \text{'CS', '?', '?', '?'} \rangle\}$

$5 \Rightarrow S_5 = \{\text{'CS', '?', '?', 'A'}\}$

$G_5 = \{\langle \text{'?', '?', '?', 'A'} \rangle\}$

$S_5 = \{$ 'CS', '?', '?', 'A' $\}$

$\langle$ CS ? ? A $\rangle$

$G_5 = \{$ '?' '?' '?' 'A' $\}$