

AI Midterm Solution

(1)

Q1 | A - initial state : Robot in the lander
all rock on its place.

operators : go to lander
go to rock 1
go to rock 2
go to rock 3

$g(x, y)$ X : Source
Y : destination

OR

Final state : Robot in The lander
all rock on the lander.

B. A* since the search space is small
and we want to find the optimal solution
But the Best one is the uniform cost search

C. time

Q2 A - when the path and Heuristics are
equals for all paths ^{in the same level} the path increasingly
towards goal.

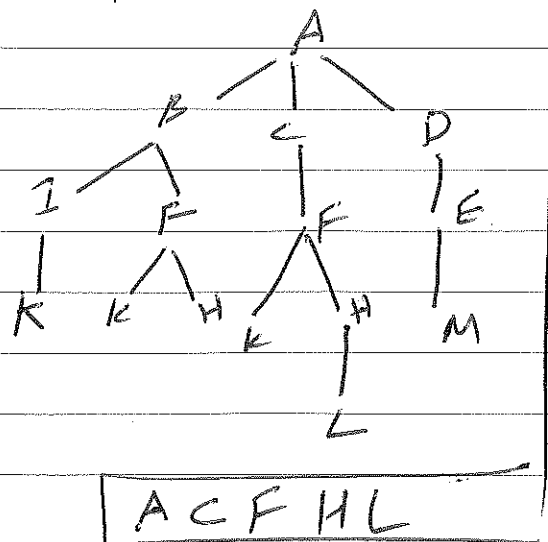
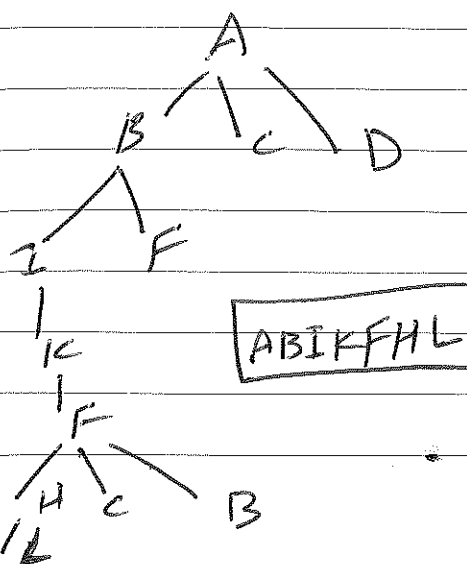
OR The cost increase from level to level and

B - from left to right at the same level.

DFS

A*

Hill

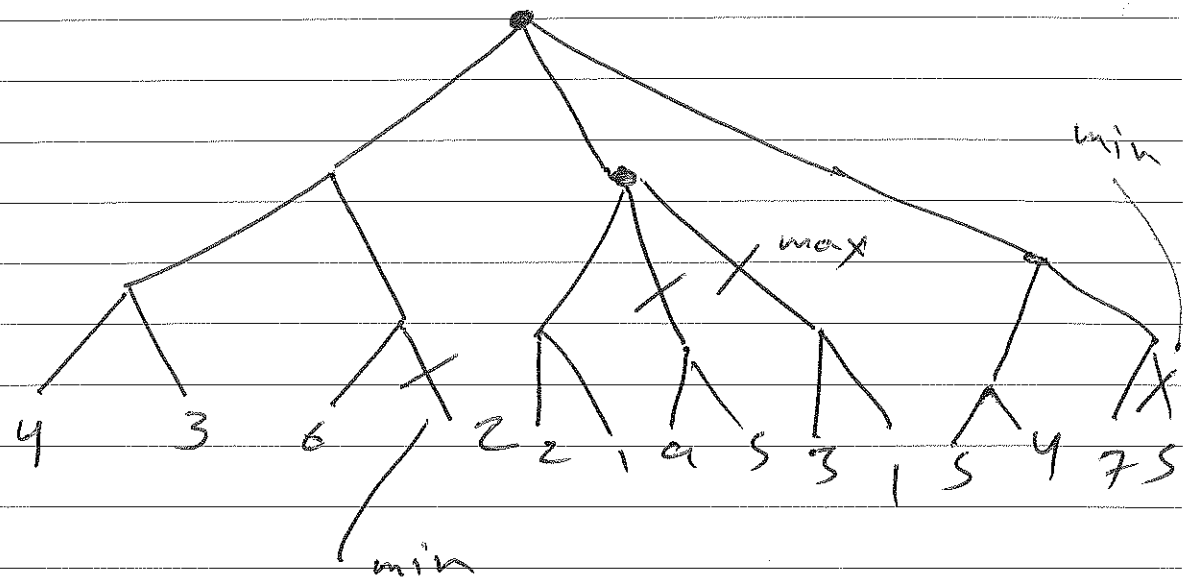


(A)

C. No. Since the heuristic is over estimate
The real cost.

D. There is no way to detect failure early
use A* consistency

E.



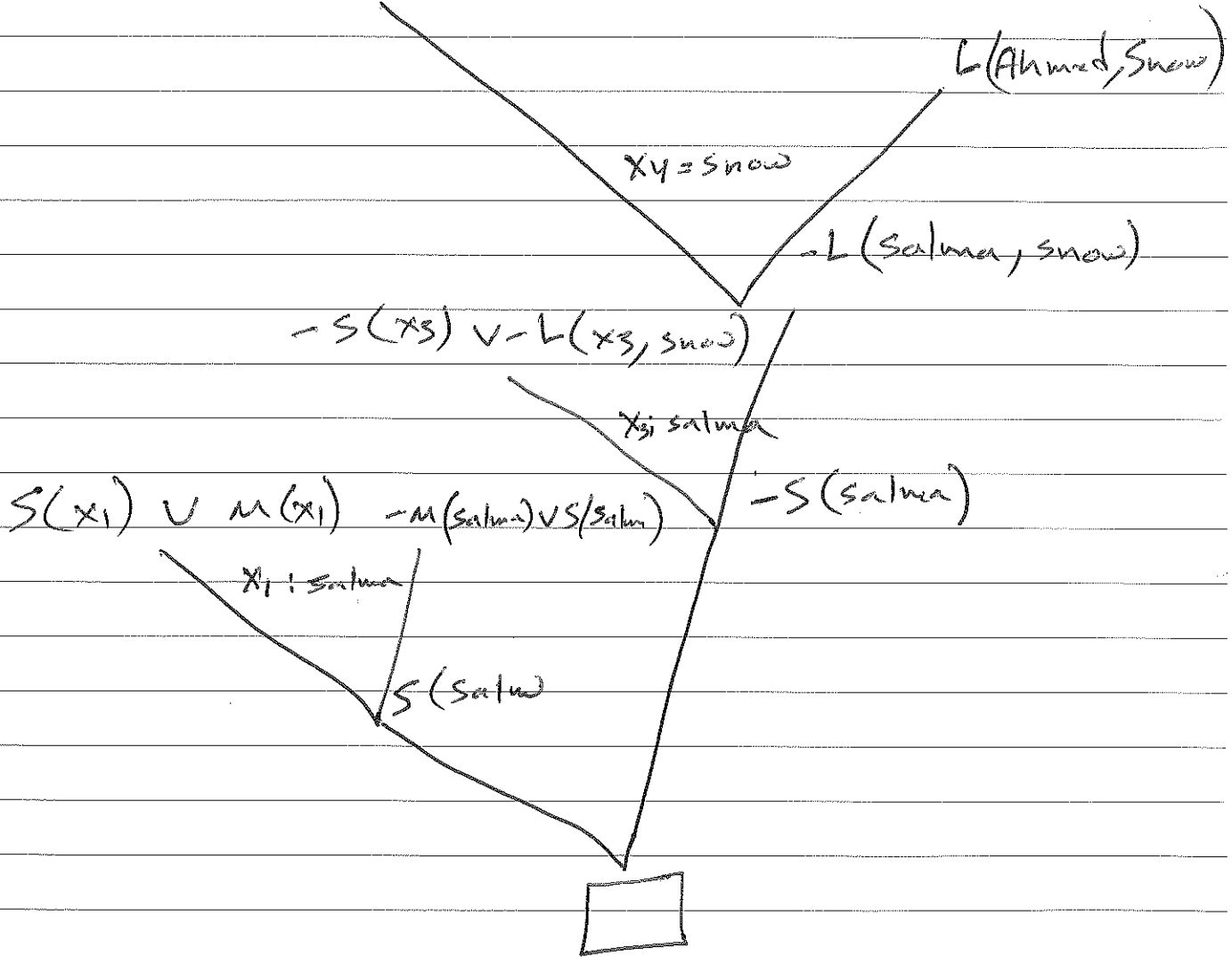
Q3 A. 1. $\forall x \text{ boy}(x) \vee \text{ girl}(x) \Rightarrow \text{child}(x)$
 2. $\forall x (\text{BZUstudent}(x)) \Rightarrow \exists y (\text{course}(y) \wedge \text{takes}(x,y))$

B. $\forall y (\neg \forall x (\text{taller}(y,x) \vee \text{wise}(x)) \vee \text{wise}(y))$
 $\forall y (\exists x (\neg \text{taller}(y,x) \wedge \text{wise}(x)) \vee \text{wise}(y))$
 $(\neg \text{taller}(y, x(y)) \wedge \text{wise}(x(y))) \vee \text{wise}(y)$
 $\neg \text{taller}(y, x(y)) \vee \text{wise}(y),$
 $\neg \text{wise}(x(y)) \vee \text{wise}(y)$

B. No \Rightarrow

$$\forall x \text{ student}(x) \rightarrow D(x) \wedge M(x) \wedge (\exists y \text{ student}(y) \wedge \neg B(y))$$

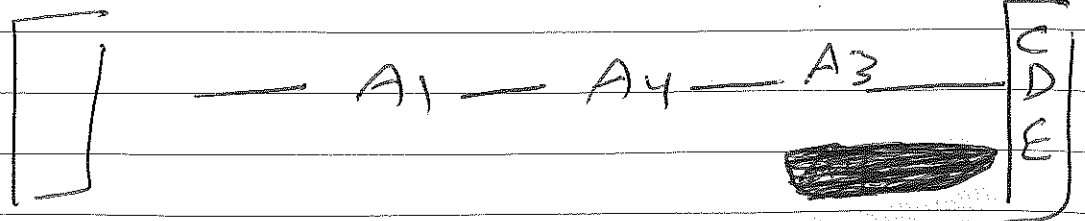
D. $\neg L(\text{Ahmed}, x_4) \vee \neg L(\text{Salma}, x_4)$



(74)

Initial

Goal



— see the solution on ritaj