

Assignment - 6

Task 2. Predicates :- ~~Task 2.~~ $(\text{Left } x)$ = x is on left $(\text{Right } x)$ = x is on right $(\text{Child } x)$ = x is child $(\text{Child } y) (\text{Boat } x)$ = x is a boat $(\text{Adult } x) \rightarrow x$ is an adult

* Initial state :-

 $(\text{Child } c_1) (\text{Child } c_2) (\text{Boat } b) (\text{Left } b)$ $(\text{Left } c_1) (\text{Left } c_2) (\text{Left } a_1) (\text{Left } a_2)$

* Goal state

 $(\text{Right } a_1) (\text{Right } a_2) (\text{Right } c_1) (\text{Right } c_2)$ * ~~Actions~~ Operations :-action One Move Right (x, y) precond $(\text{Left } x), (\text{Left } y), (\text{Boat } y)$ effect $(\text{Right } x), (\text{Right } y), (\text{Left } x)', (\text{Left } y)'$ action Two Moves Right (x, y, z) precond $(\text{Left } x), (\text{Left } y), (\text{Left } z), (\text{Child } x), (\text{Child } y), (\text{Boat } z)$ effect $(\text{Right } x), (\text{Right } y), (\text{Right } z), (\text{Left } x)', (\text{Left } y)', (\text{Left } z)'$ action One Move Left (x, y) precond $(\text{Right } x), (\text{Right } y), (\text{Boat } y)$ effects $(\text{Left } x), (\text{Left } y), (\text{Right } x)', (\text{Right } y)'$

action	Two Monies left (x, y, z)
Precond	$(right\ x) (right\ y) (right\ z) (child\ x) (child\ y)$ $(boat\ z)$
effect	$(left\ x) (left\ y) (left\ z) (right\ x)' (right\ y)'$ $(right\ z)'$

Task 3 (a) Execution monitoring/online replanning

No changes are made to the actions where they are performed until the expected output is found (goal or Success state).

With each action, we monitor the current state and a need of replanning occurs only if the goal is not met.

(b) Conditional planning.

Changes will occur in the actions as follows:-

Task 4 Resulting state from applying action $aaa(B, C)$ to S_1 :-

(A Ht 1)

(B Ht 1)

(C Ht 1)

(eee1 B C)

(eee2 B)

(ppp1 B C)

(ppp2 A)

(ppp2 B)

(ppp3 C)

(eee1 A C)

(eee3 A)

Task 5 \rightarrow no. of predicates = 4 arguments \rightarrow 3 max. const \rightarrow 5

\rightarrow So, possible predicate assignment :-

$$[4 \cdot 5^1 \quad 4 \cdot 5^3] = [20 \quad 500]$$

A state could be either true or false.

\therefore 2 possibilities.

\therefore Tight bound would be :-

$$[2^{20} \quad 2^{500}]$$