

ASSIGNMENT-6.

* Task:-2.

* Initial & Goal State.

(adult 1 Adult)

(adult 2 Adult)

(adult 3 Adult)

(child 1 child)

(child 2 child)

(child 3 child)

(boat Boat)

(preconds

(left adult 1) (left adult 2)

(left adult 3) (left child 1) (left child 2)

(left child 3) (left boat)

(effects

(right adult 1) (right adult 2)

(right adult 3) (right child 1)

(right child 2) (right child 3) (right boat))

* Arguments, pre-conditions & effect for every action

(operator

Carry- adult

(params

(< adult > Adult) (< boat > Boat))

(~~effects~~

(preconds

left
(on right <adult>) (on left <boat>)

(effects

(on right <adult>) (on right <boat>)

(del on left <adult>) (del on left <boat>))

)
(operator

carry child - right

(params

(<child1> child) (<child2> child)

(<child3> child) (<boat> Boat))

(preconds

(on left <child1>) (on left <child2>)

(on left <child3>) (on left <boat>))

(effects

(on right <child1>) (on right <child2>)

(on right <child3>) (on right <boat>)

(del on left <child1>) (del on left <child2>)

(del on left <child3>) (del on left <boat>))

) (operator

carry - child - left

(params

(<child1> child) (<child2> child)

(<boat> Boat))

(preconds

(on right <child1>) (on right <child2>)

(on right <boat>)

(effects

(on left <child1>) (on left <child2>) (on left <boat>)

(del on right <child1>) (del on right <child2>)

(del on right <boat>))
)

* Task:- 3

For the word Jungle, there are 5 predicate & each predicate takes 3 arguments & there are 4 constants

Upper bound:

1 predicate take 3 arguments

i.e. $4 \times 4 \times 4 = 64$

for 5 predicate 5×4^3

$$= 5 \times 64 = 320 //$$

Predicates are boolean & always return true / false

\therefore Solution is $2^n = 2^{320} //$

Lower bound:

Considering 1 predicate take 1 arg.

$$= 4 \times 1 = 4$$

for 5 predicates $= 5 \times 4 = 20$

\therefore possible solutions $= 2^{20} //$

Task-4S1 State

(A ttt1)

(A ttt1)

(B ttt1)

(B ttt1)

(C ttt1)

Applying

(C ttt1)

(ppp1 B c)

aaa(B,c)

(ppp1 B c)

(ppp2 A)

→

(ppp2 A)

(ppp3 B)

(ppp2 B)

(ppp3 C)

(ppp3 C)

(eee1 A c)

(eee1 B c)

(eee2 C)

(eee2 B)

(eee3 C)

(eee3 A)

(eee3 A)

Task-5

• Execution Monitoring/Online Replanning.

→ for execution monitoring, no changes are done to the actions if the plan is same as deterministic one.

→ The action is done repeatedly until it reaches the goal state.

→ In every action, the present state is monitored if further actions or replanning is done, if goal is not met.

• Conditional Planning

→ The boat may reach the opposite end or it may not as in case of a single person, the boat can be blown back to the start point

① carry-child-left

C operator

carry-child-left

C params

((<child1> child) (<child2> child)
(<boat> Boat)))

C preconds

((onright <child1>) (onright <child2>)
(onright <boat>)))

C effects

((onleft <child1>) (onleft <child2>)
(onleft <boat>) (del onright <child1>)
(del onright <child2>)
(del onright <boat>))
(onright <boat>) (onright <child>)))

② carry-adult

C operator

carry-adult

C params

(<adult> Adult) (<boat> Boat))

C preconds

(onleft <adult>) (onleft <boat>))

(effects

(onright <adult>) (onright <boat>))

(del onleft <adult>) (del onleft <boat>))

v (onleft <adult1>)

(onleft <adult2>) (onleft <boat>))

)

③ Operator carrying

'carry-child-right will

have no change.