

task 6 \rightarrow We can assume that there are 5 states for each predicate if each predicate has only 1 argument. Then there are $2^{4 \times 5} = 2^{20}$ states.

If each predicate has 4 arguments, then there are 5^4 states for each predicate.

So there are $2^{4 \times 5^4} \Rightarrow 2^{2500}$ states

So, tight bound $\rightarrow [2^{20}, 2^{2500}]$

task 7 \rightarrow if successful, the boat ends up where we want it.

if unsuccessful, the boat is back to the origin side

1 \rightarrow Online Replanning \rightarrow We do not modify anything. if the boat is blown off the course, we try again or replan.

2 \rightarrow for conditional planning

action: move adult

Parameters (adult, boat, from, to)

Precondition $[ADULT(A) \wedge BOAT(B)$

$\wedge SIDE(from) \wedge SIDE(to)$

$\wedge loc(A, from) \wedge loc(boat, from)$

Effect: $[loc(A, to) \wedge loc(B, to) \wedge$

$\neg loc(A, from) \wedge \neg loc(B, from)]$

\vee

$[ADULT(A) \wedge BOAT(B)$

$\wedge SIDE(from) \wedge SIDE(to)$

$\wedge loc(A, from) \wedge loc(B, from)]$

* The same can be done to move a child as well.