AI Planning for Autonomy

Solution Problem Set IV: PDDL and General Heuristics

1.

For a given set of Blocks B:

F={ on(x,y), onTable(x), clear(x), holding(x), armFree | $x, y \in B$ },
A= { stack(x,y):

- Prec: holding(x), clear(y)
- Add: clear(x), on(x,y), armFree
- Del: clear(y), holding(x)

| $x, y \in B$ }

A = A∪ { unstack(x,y):

- Prec: on(x,y), clear(x), armFree
- Add: holding(x), clear(y)
- Del: clear(x), on(x,y), armFree

| $x, y \in B$ }

A= A∪ { putdown(x):

- Prec: holding(x)
- Add: clear(x), onTable(x), armFree
- Del: holding(x)

| $x \in B$ }

A = A∪ { pickup(x):

- Prec: onTable(x), clear(x), armFree
- Add: holding(x)
- Del: clear(x), onTable(x), armFree

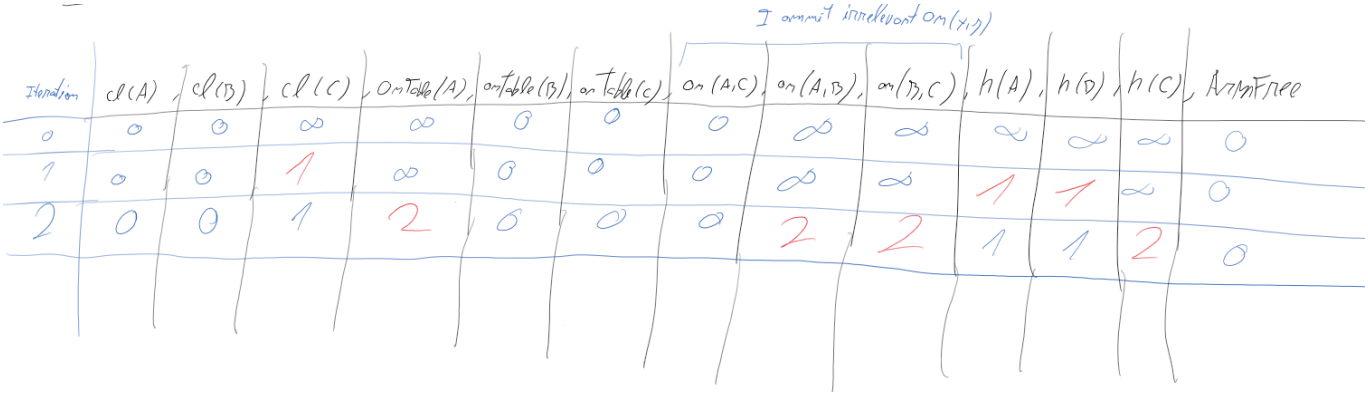
| $x \in B$ }

I = {on(a,c), onTable(c), onTable(b), clear(a), clear(b), armFree}
F = { on(a,b), on(b,c) }

2.

- What is a (relaxed) planning graph? See lecture slides.
- Compute $h^{max}(s_0)$ for this blocks-world problem. $h^{add}(s_0) = 5$. For computation, see below.

- Compute $h^{max}(s_0)$ for this blocks-world problem. $h^{max}(s_0) = 2$. For computation, see below.



The table for h_{add} changes only the value for $on(B, C)$ to 3, hence h value of the Goal is 5.