Problem formulation

Initial: \( On(A, C) \land On(B, Table) \land On(C, Table) \land Clear(A) \land Clear(B) \land Clear(Table) \)

Goal: \( On(B, C) \)

Actions:

\( Move(b, x, y) \)

Precondition: \( On(b, x) \land Clear(b) \land Clear(y) \land x \neq Table \)

Effect: \( On(b, y) \land Clear(x) \land \neg On(b, x) \land \neg Clear(y) \)

\( MoveToTable(b, x) \)

Precondition: \( On(b, x) \land Clear(b) \land (x \neq Table) \)

Effect: \( On(b, Table) \land Clear(x) \land \neg On(b, x) \)

Progression Planning in BFS

\[ \text{On}(A, C) \land \text{On}(B, \text{Table}) \land \text{On}(C, \text{Table}) \land \text{Clear}(A) \land \text{Clear}(B) \land \text{Clear}(\text{Table}) \]

\[ \text{Move}(A, C, B) \ b/A, x/C, y/B \quad \text{MoveToTable}(A, C) \quad \text{Move}(B, \text{Table}, A) \ b/B, x/\text{Table}, y/A \]

\[ \text{On}(A, B) \land \text{Clear}(C) \land \text{On}(B, \text{Table}) \land \text{On}(C, \text{Table}) \land \text{Clear}(A) \land \text{Clear}(\text{Table}) \]
\[ \text{Move}(A, B, C) \quad \text{MoveToTable}(A, B) \quad \text{Move}(C, \text{Table}, A) \]

... \quad ... \quad \text{On}(B, C) \land ... \text{Goal State}
Regression Planning

\[ \text{On}(B, C) \]

\[ \text{Move}(B, x, C) \ b/B, y/C \]

\[ \text{Move}(B, \text{Table}, C) \ x/\text{Table} \text{ (considering initial state)} \]

\[ \text{On}(B, \text{Table}) \land \text{Clear}(B) \land \text{Clear}(C) \]

\[ \text{MoveToTable}(B, \text{Table}) \]

\[ \text{MoveToTable}(b, B) \]

\[ \text{MoveToTable}(b, C) \]

\[ \text{Move}(A, C) \]

\[ \text{Clear}(B) \land \text{Clear}(C) \land \text{On}(B, x) \land \text{Clear}(B) \]

\[ \ldots \]

\[ \text{On}(B, \text{Table}) \land \text{On}(b, B) \land \text{Clear}(b) \land \text{Clear}(C) \]

\[ \text{(Hopeless)} \]

\[ \text{On}(B, \text{Table}) \land \text{Clear}(B) \land \text{On}(A, C) \land \text{Clear}(A) \]

\[ \text{satisfied in initial state, done!} \]