Name:

Worksheet: L07 – Situation Calculus

CSCI-534: Robot Planning & Manipulation

Spring 2020

http://www.neil.dantam.name/rpm/B07-situation.pdf

1. **State Space:** For the following objects and predicate:

   Objects: $C = \{\texttt{suitcase}, \texttt{backpack}\}$, $B = \{\texttt{laptop}, \texttt{banana}, \texttt{book}\}$

   Predicate: $\texttt{contains} : C \times B \mapsto \mathbb{B}$

   (a) Write out all fluents:

   (b) How many individual states are there? (What is the size of the state space?)

2. **Effects:** Write the successor state for the $\texttt{unstack}\,(?x, ?y)$ action illustrated in Figure 1:

   Precondition: $\texttt{on}\,(?x, ?y) \wedge \texttt{clear}\,(?x) \wedge \texttt{handempty}\,()$

   Effect: $\neg\texttt{on}\,(?x, ?y) \wedge \neg\texttt{clear}\,(?x) \wedge \neg\texttt{handempty}\,() \wedge \texttt{holding}\,(?x) \wedge \texttt{clear}\,(?y)$

3. **PDDL Action:** Write the $\texttt{unstack}\,(?x, ?y)$ action in PDDL

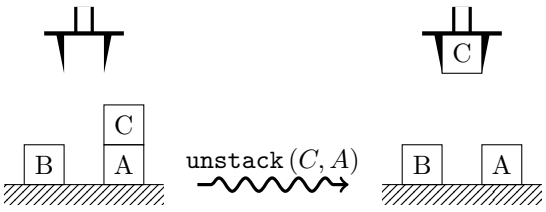

Figure 1: Blocksworld Action

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Figure 2: A start and goal state

4. **PDDL Facts:** Write the PDDL facts corresponding to Figure 2.