

Exercise Sheet 6

Exercise 6.1 - Delete Relaxation

a) Give the relaxation Π^+ of Π

$$A = \{haveCake, eatenCake, haveNoCake\}$$

$$I = \{haveCake \rightarrow 0, eatenCake \rightarrow 0, haveNoCake \rightarrow 1\}$$

$$O^+ = \{eatCake, bakeCake\}$$

$$eatCake^+ = \langle haveCake, haveNoCake \wedge eatenCake \rangle$$

$$bakeCake^+ = \langle haveNoCake, haveCake \rangle$$

$$\gamma = haveCake \wedge eatenCake$$

The negative effects of the operators were removed.

b) Give a sequence of π of operators (as short as possible) from O such that π is not a plan of Π but π^+ is a plan of Π^+ .

$$\pi^+ = bakeCake^+, eatCake^+$$

Why? We can simulate this plan in both planning tasks to demonstrate it.

States after $bakeCake^+$

$$S_1 = \{haveCake \rightarrow 1, eatenCake \rightarrow 0, haveNoCake \rightarrow 1\}$$

States after $eatCake^+$

$$S_1 = \{haveCake \rightarrow 1, eatenCake \rightarrow 1, haveNoCake \rightarrow 1\}$$

Goal accomplished.

If we run the same plan π in Π

States after $bakeCake$

$$S_1 = \{haveCake \rightarrow 1, eatenCake \rightarrow 0, haveNoCake \rightarrow 0\}$$

States after $eatCake$

$$S_1 = \{haveCake \rightarrow 0, eatenCake \rightarrow 1, haveNoCake \rightarrow 1\}$$

Goal is not accomplished as we don't have cake.