Artificial Intelligence

Assignment 8

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Submission until: 07.07.2022, 7:00 a.m.
Tutorial on: 07.07.2022 and 08.07.2022

GROUP HOLLERITH - SOLUTION

Group Members:

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1. **STRIPS**

(1) Initial STRIPS database:

S = {robot(rob), rock(r_1), rock(r_2), rock(r_3), pos(a), pos(b), pos(c), pos(d), at(r_1,a), at(r_2,b), at(r_3,c), at(rob,d)}

STRIPS goal:

G = {analyzed(r_1), analyzed(r_2), analyzed(r_3), stowed(r_1), stowed(r_2), stowed(r_3)}

The basic instances that cannot be changed by the execution of actions:

{robot(rob), rock(r_1), rock(r_2), rock(r_3), pos(a), pos(b), pos(c), pos(d)}

(2) STRIPS Notation:

- pickup(R,X):
  - C: at(X,P), at(R,P), free(R)
  - D: at(X,P), free(R)
  - A: holds(R,X)

- analyze(R,X):
  - C: holds(R,X)
  - D:
  - A: analyzed(X)

- stowAway(R,X):
  - C: holds(R,X), analyzed(X)
  - D: analyzed(X)
  - A: stowed(X), free(R)

(3) Solution of frame problem in STRIPS:

There are 3 components in a frame problem. They are-

I. Preconditions
II. Delete list(D-list)
III. Add list(A-list)

Preconditions(C): Preconditions are the initial truths before the operation
Delete list(D): These are the truths that become false after the operation
Add list(A): These are the ones that become true after the operation

2. Default rules:

(1) Assume that a person's hometown is that of his/her spouse:

$$D = \left\{ \frac{SPOUSE(x,y) \wedge \text{hometown(y)}=z : M\ hometown(x)=z}{hometown(x)=z} \right\}$$

(2) Assume that a person's hometown is where his or her employer is located:

$$D = \left\{ \frac{EMPLOYER(x,y) \wedge \text{location(y)}= z : M\ hometown(x)=z}{hometown(x)=z} \right\}$$

(3) Few Germans hate beer:

$$D = \left\{ \frac{fewGermans\ (x) : hateBeer(x)}{hateBeer(x)} \right\}$$