# STRIPS Representation

- State-based view of time.
- The actions are external to the logic.
- Given a state and an action, the STRIPS representation is used to determine
  - whether the action can be carried out in the state
  - what is true in the resulting state

# STRIPS Representation: Idea

- Predicates are **primitive** or **derived**.
- Use normal rules for derived predicates.
- The STRIPS representation is used to determine the truth values of primitive predicates based on the previous state and the action.
- Based on the idea that most predicates are unaffected by a single action.
- **STRIPS assumption:** Primitive relations not mentioned in the description of the action stay unchanged.

# STRIPS Representation of an action

The STRIPS representation for an action consists of:

**preconditions** A list of atoms that need to be true for the action to occur

**delete list** A list of those primitive relations no longer true after the action

**add list** A list of the primitive relations made true by the action

# STRIPS Representation of “pickup”

The action $pickup(Ag, Obj)$ can be defined by:

preconditions $[autonomous(Ag), Ag \neq Obj, at(Ag, Pos),$
$sitting\_at(Obj, Pos)]$

delete list $[sitting\_at(Obj, Pos)]$

add list $[carrying(Ag, Obj)]$

# STRIPS Representation of “move”

The action $move(Ag, Pos_1, Pos_2)$ can be defined by:

preconditions $[autonomous(Ag), adjacent(Pos_1, Pos_2, S)\ ,$
$sitting\_at(Ag, Pos_1)]$

delete list $[sitting\_at(Ag, Pos_1)]$

add list $[sitting\_at(Ag, Pos_2)]$

# Example Transitions

$$\left\{ \begin{array}{l} \mathit{sitting\_at}(\mathit{rob}, o109). \\ \mathit{sitting\_at}(\mathit{parcel}, \mathit{storage}). \\ \mathit{sitting\_at}(k1, \mathit{mail}). \end{array} \right\}$$

$$\xrightarrow{\mathit{move}(\mathit{rob}, o109, \mathit{storage})} \left\{ \begin{array}{l} \mathit{sitting\_at}(\mathit{rob}, \mathit{storage}). \\ \mathit{sitting\_at}(\mathit{parcel}, \mathit{storage}). \\ \mathit{sitting\_at}(k1, \mathit{mail}). \end{array} \right\}$$

$$\xrightarrow{\mathit{pickup}(\mathit{rob}, \mathit{parcel})} \left\{ \begin{array}{l} \mathit{sitting\_at}(\mathit{rob}, \mathit{storage}). \\ \mathit{carrying}(\mathit{rob}, \mathit{parcel}). \\ \mathit{sitting\_at}(k1, \mathit{mail}). \end{array} \right\}$$