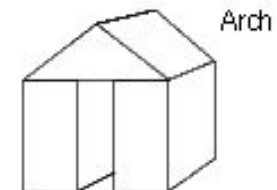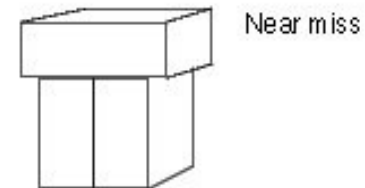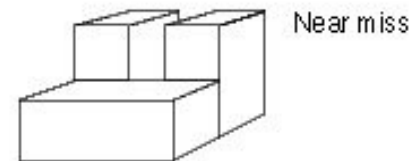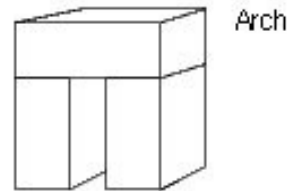# Learning by Analyzing differences: Positive and negative examples

- Learning from carefully crafted examples
-
- The brick-top must be supported by pillars
-
- The pillars must not touch
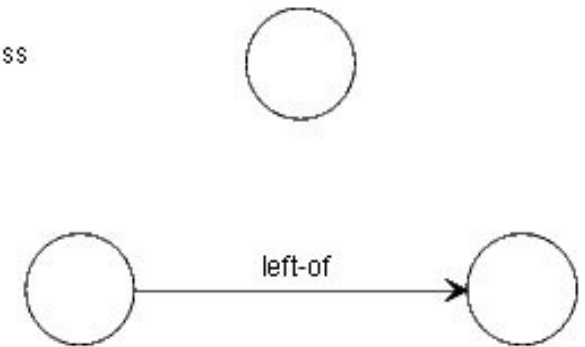-
- Top can be a wedge or a brick

Arch

Near miss

Near miss

Arch

Responding to near misses (negative examples) impr

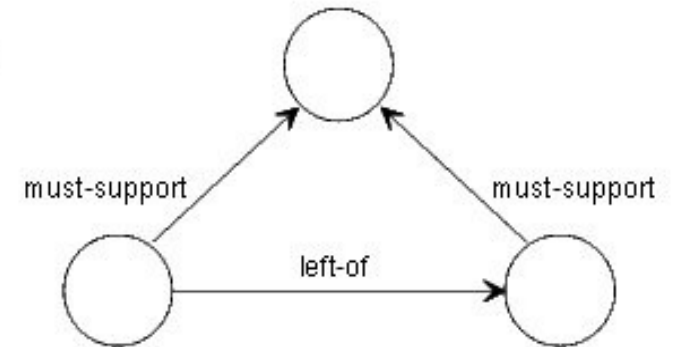- Here's an initial description and successive modifications to the model as it evolves

(a) Arch

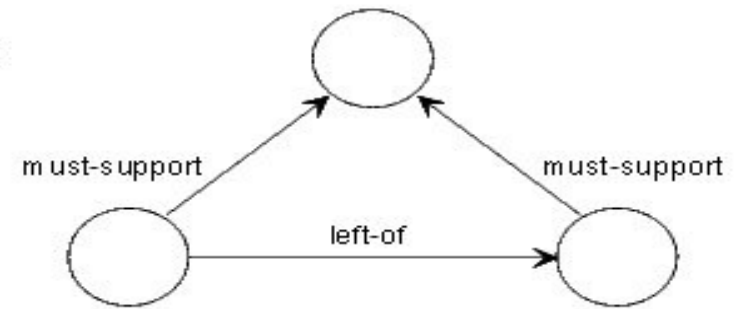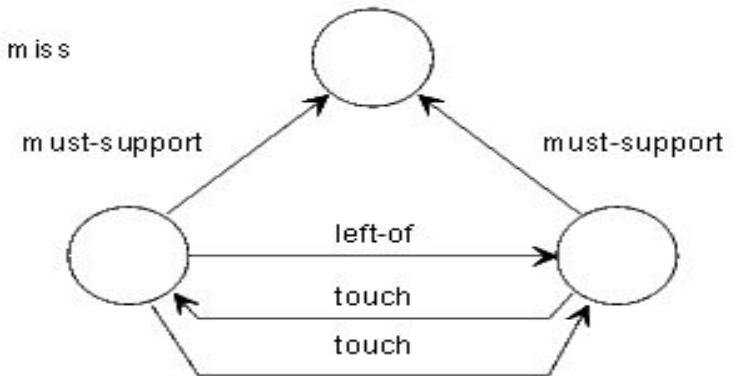support   left-of   support

(b) Near miss

left-of

(c) Arch

must-support   left-of   must-support
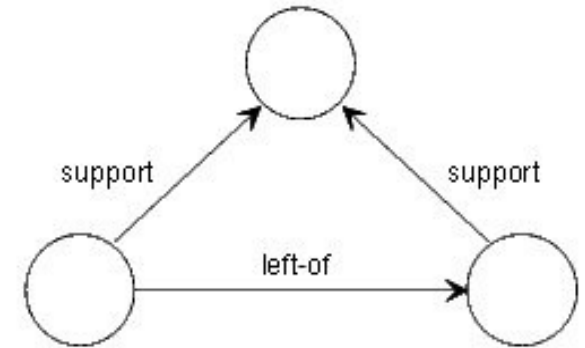
Supports must not touch
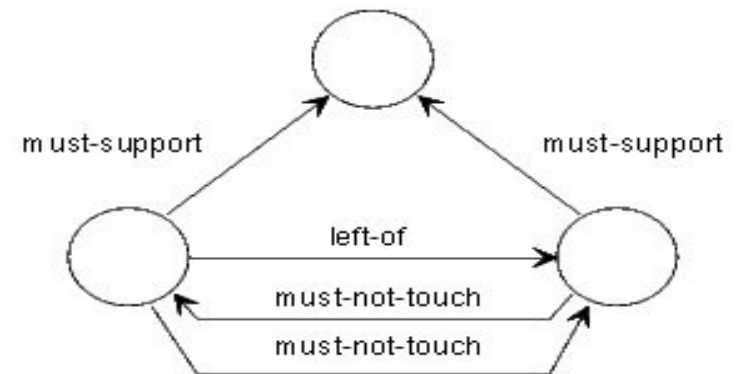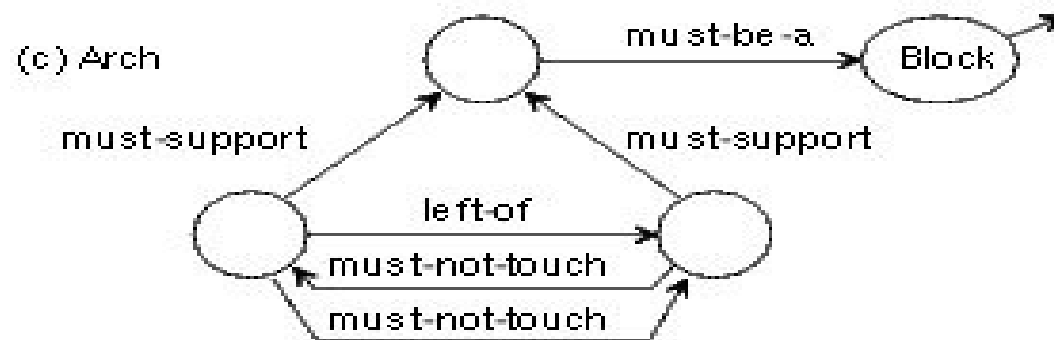

(a) Arch

(b) Near miss

(c) Arch

Brick or wedge? Positive example of another arch

(a) Arch

must-support   must-support

left-of

must-not-touch

must-not-touch

is-a   Brick   Block

(b) Arch

must-support   must-support

left-of

must-not-touch

must-not-touch

is-a   Wedge   Block

(c) Arch

must-support   must-support

left-of

must-not-touch

must-not-touch

must-be-a   Block
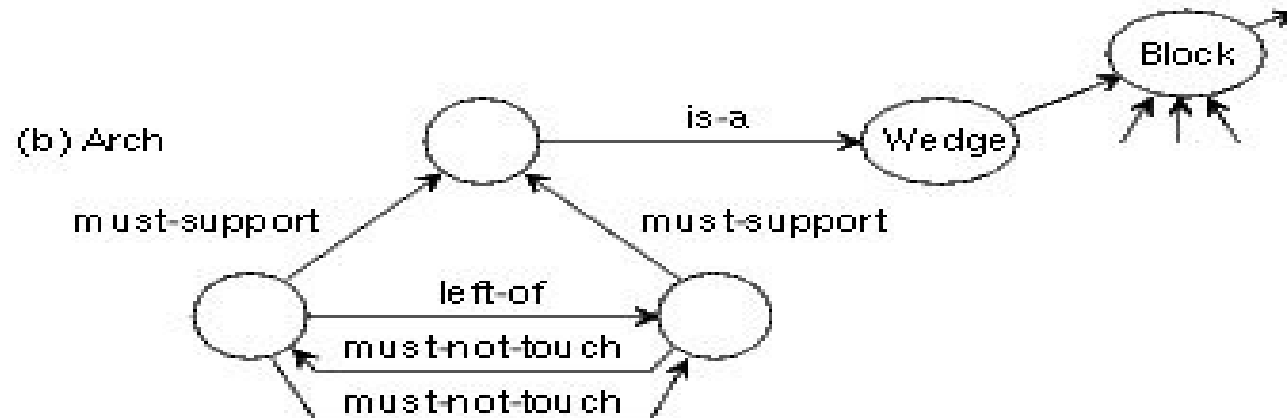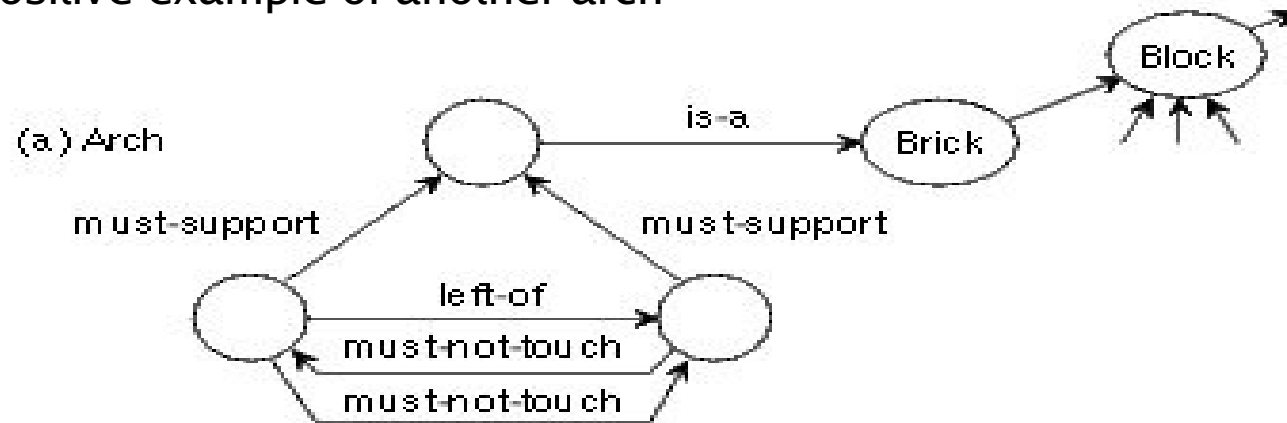
Negative examples:

Generalize or Specialize?

Positive Examples:

Generalize or Specialize?

Version Spaces: Learning by managing multiple models
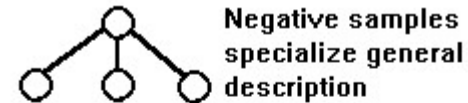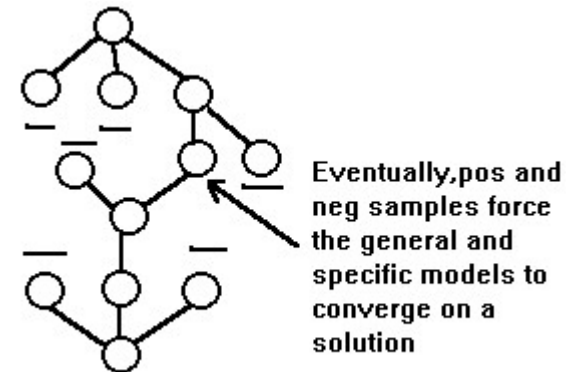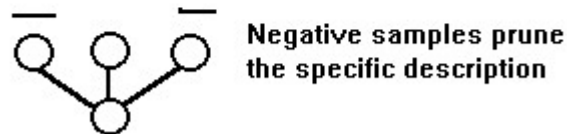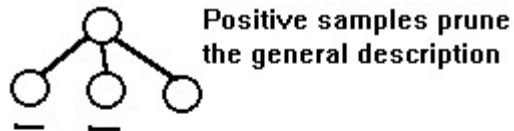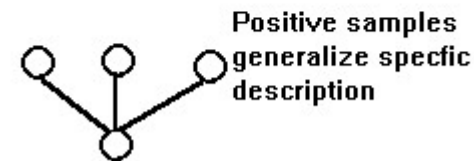
The most general model; matches everything

Negative samples specialize general description

Positive samples generalize specfic description

The most specific model; matches only thing

Positive samples prune the general description

Negative samples prune the specific description

Eventually,pos and neg samples force the general and specific models to converge on a solution

1. Each time a general model is specialized, that specialization must be a generalization of an existing specific model. Similarly each time a specific model is generalized, that generalization must be a specialization of an existing general model

2. Each time a general model is specialized, that specialization must not be a specialization of another general model