Maze

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Machine and Reinforcement Learning in Control Applications

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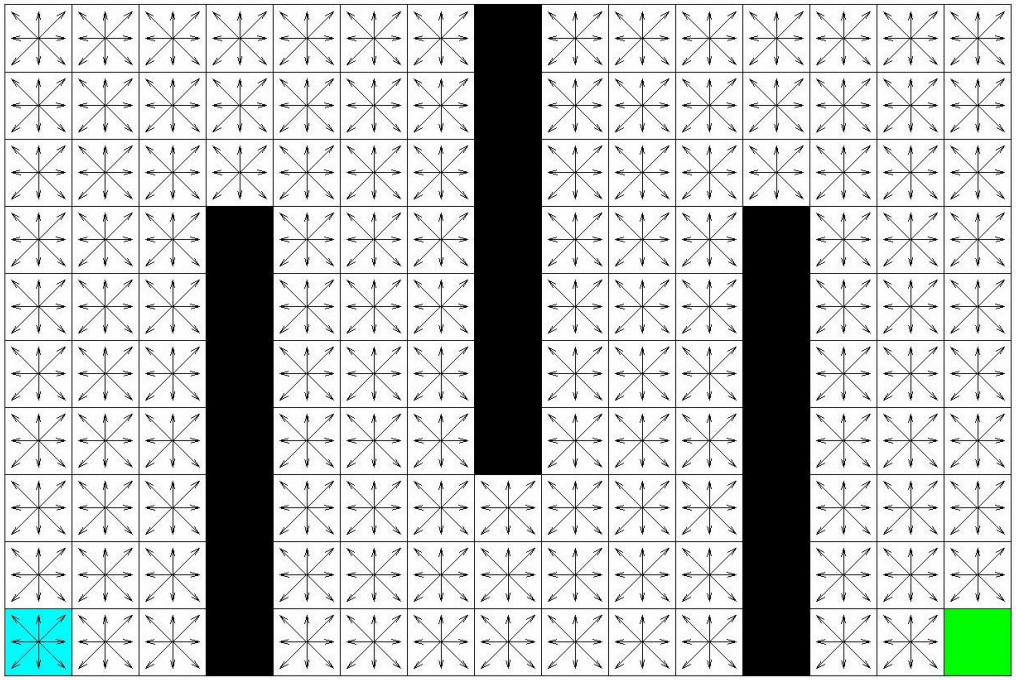
Problem

Learn to get out of a maze

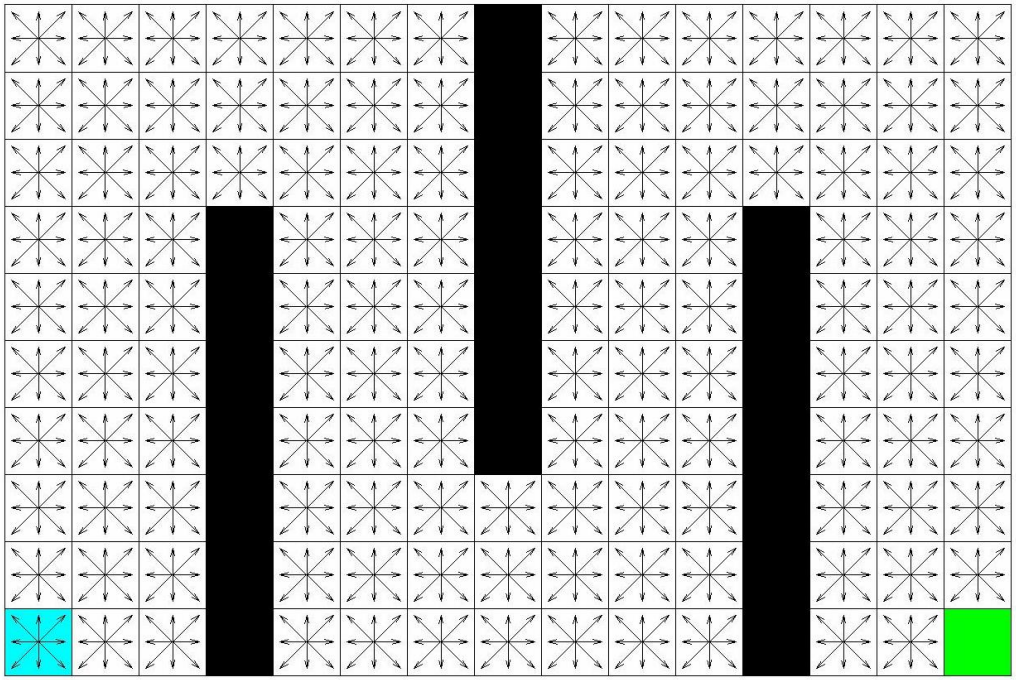
Problem formulation

- Consider the grid world on the right;
- The goal is to reach the green box;
- A waterfall pushes the agent toward the bottom of the grid



Problem formulation

- 8 possible directions: **N, S, E, W, NE, NW, SE, SW**;
- Reward:
  - -1 for each step



Model

- The **state** is the position in the Gridworld
  - we have $X \cdot Y$ states.
- The **action** is the direction of the movement
  - we have 8 actions.

Indirect reinforcement learning

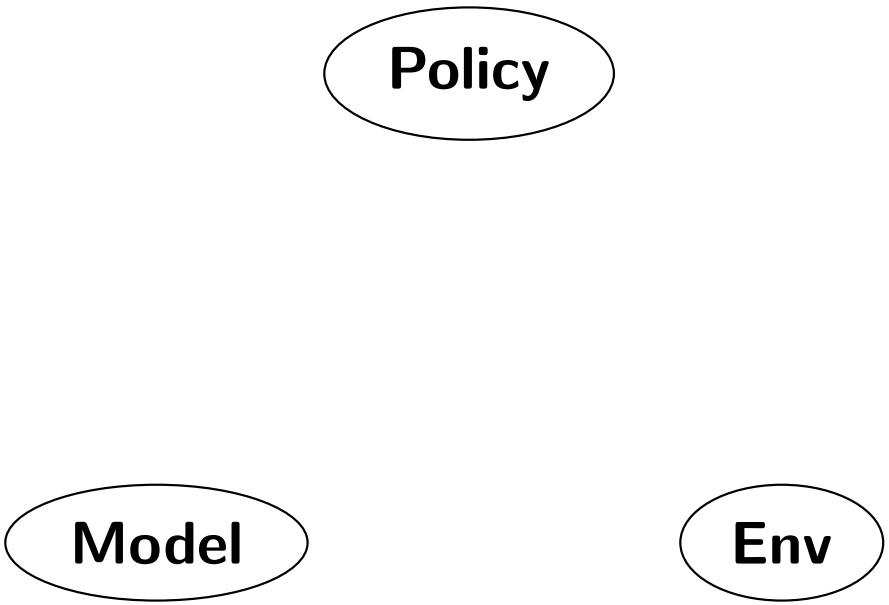
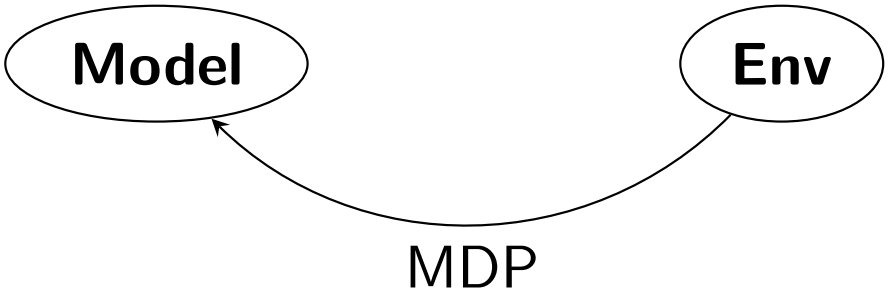


Figure: Planning

Figure: Learning

Indirect reinforcement learning



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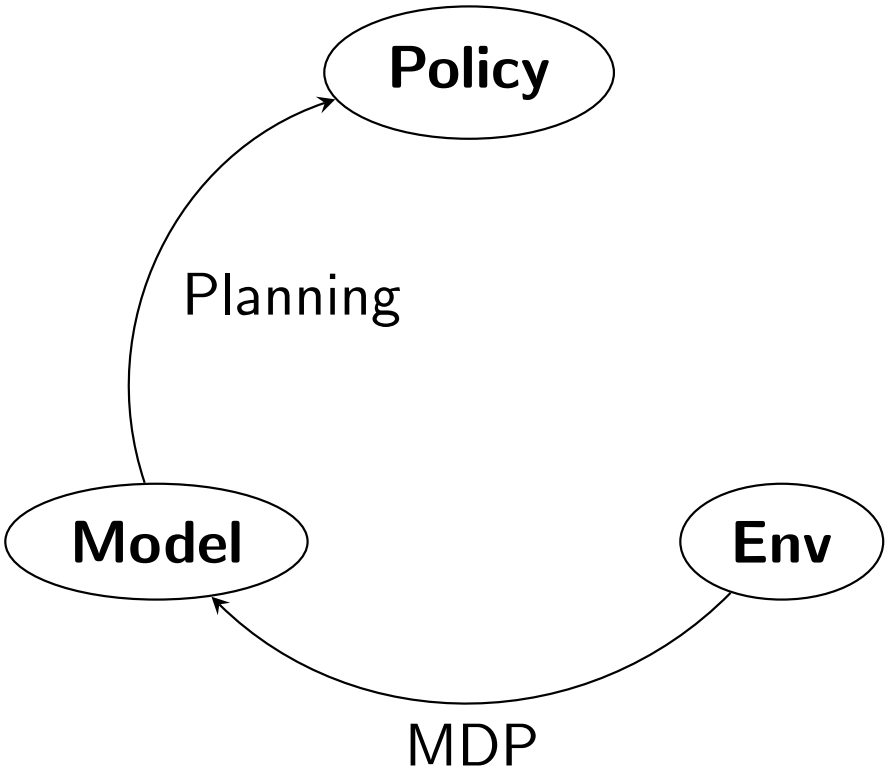

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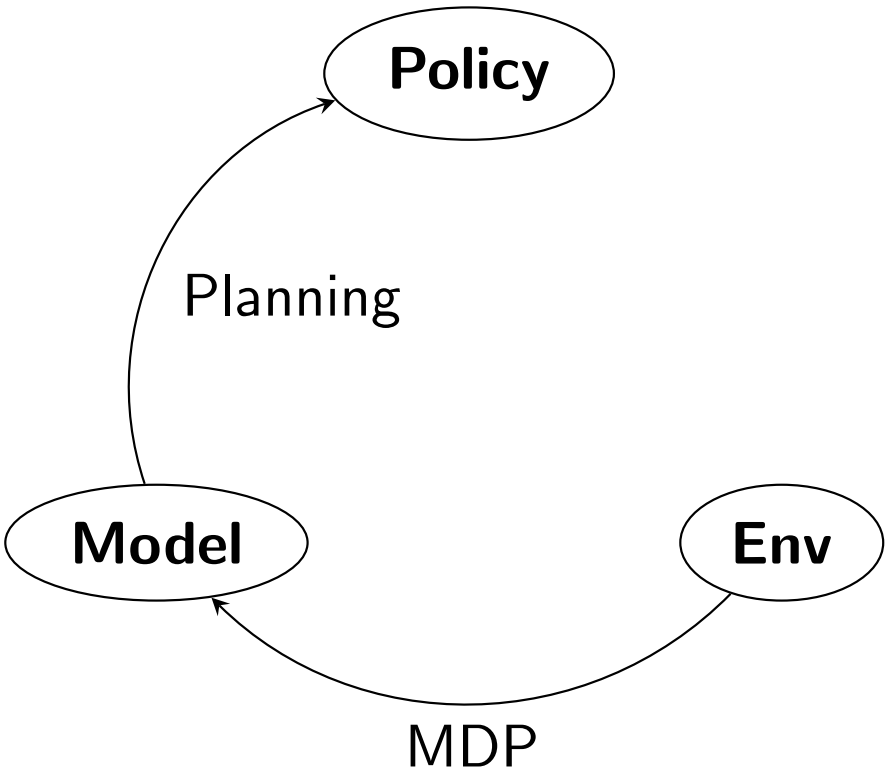

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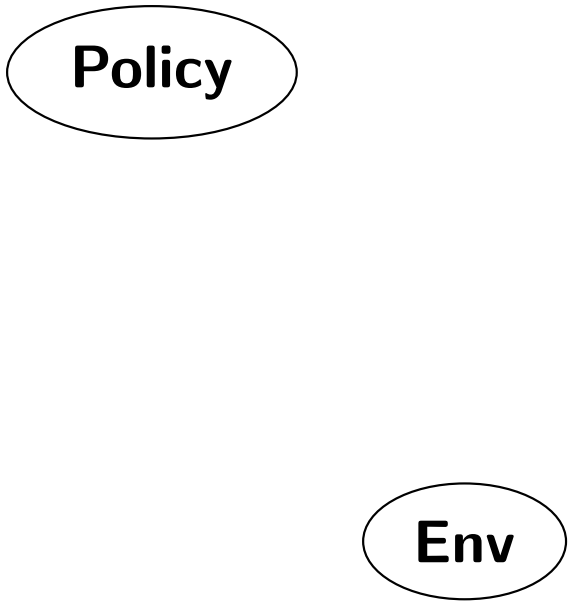

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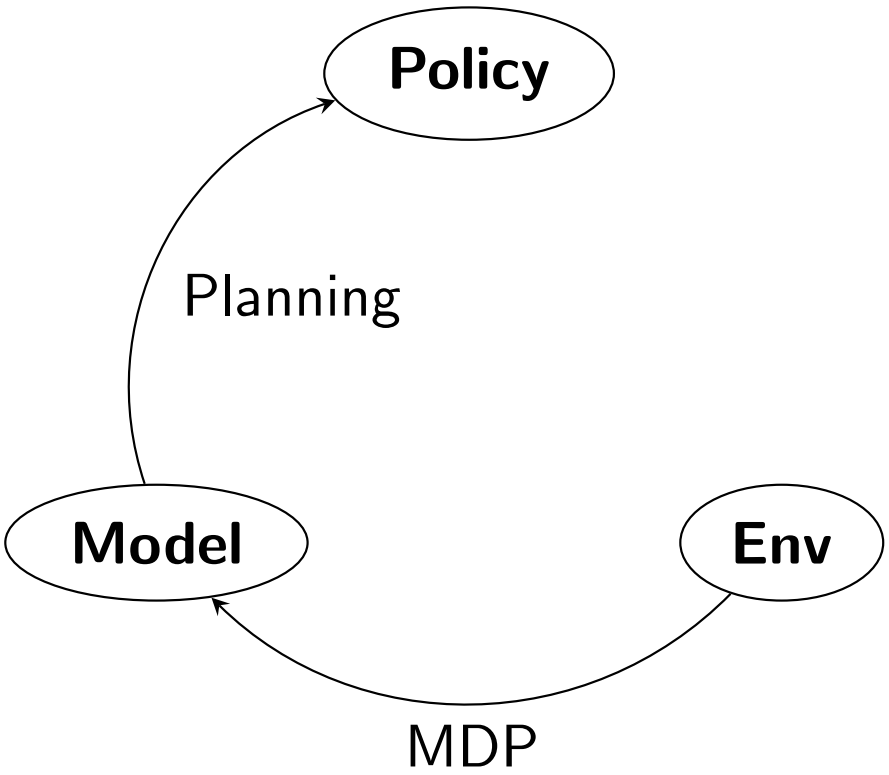

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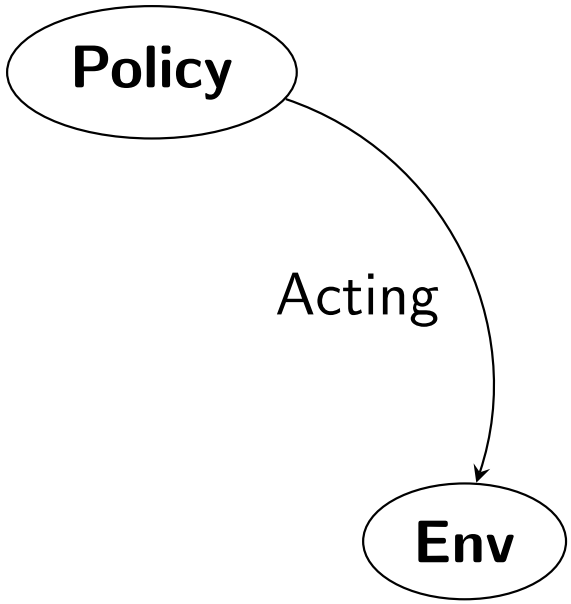

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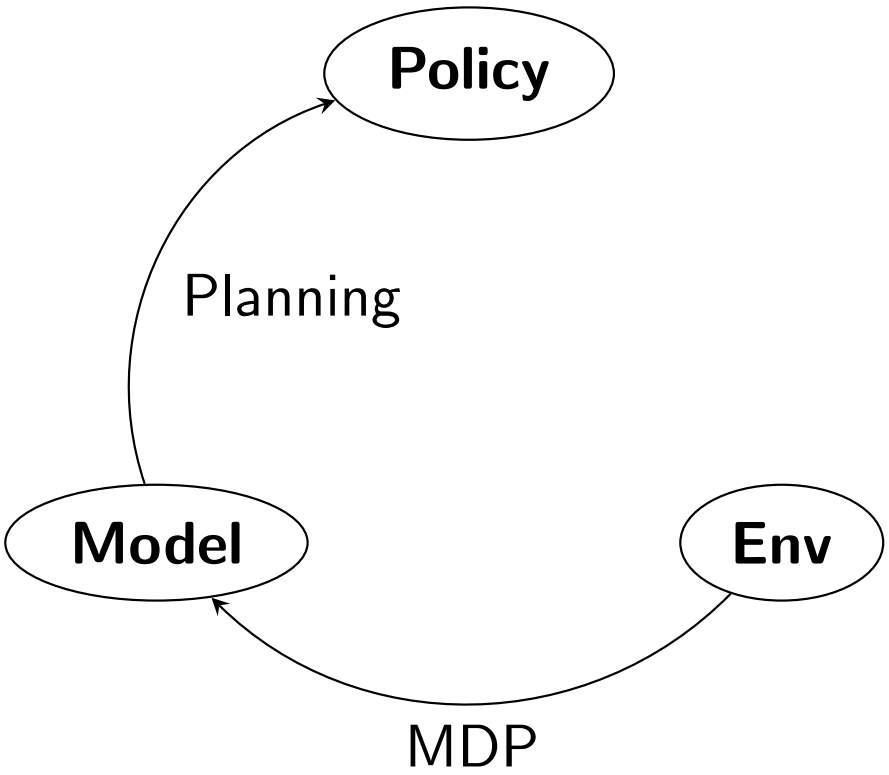

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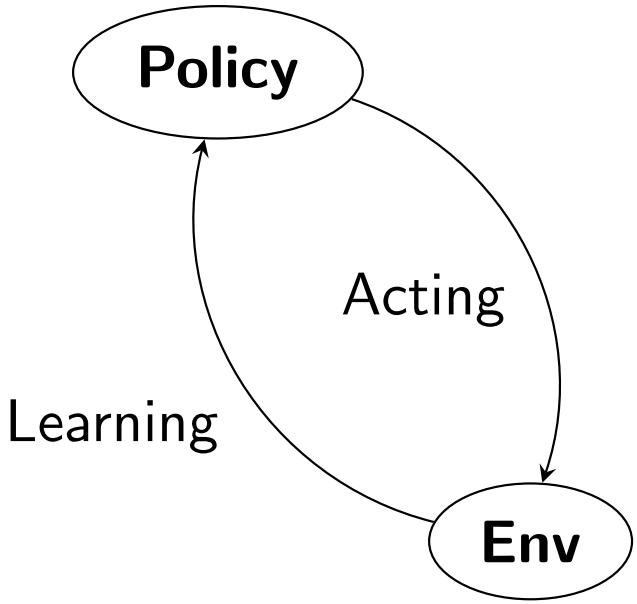

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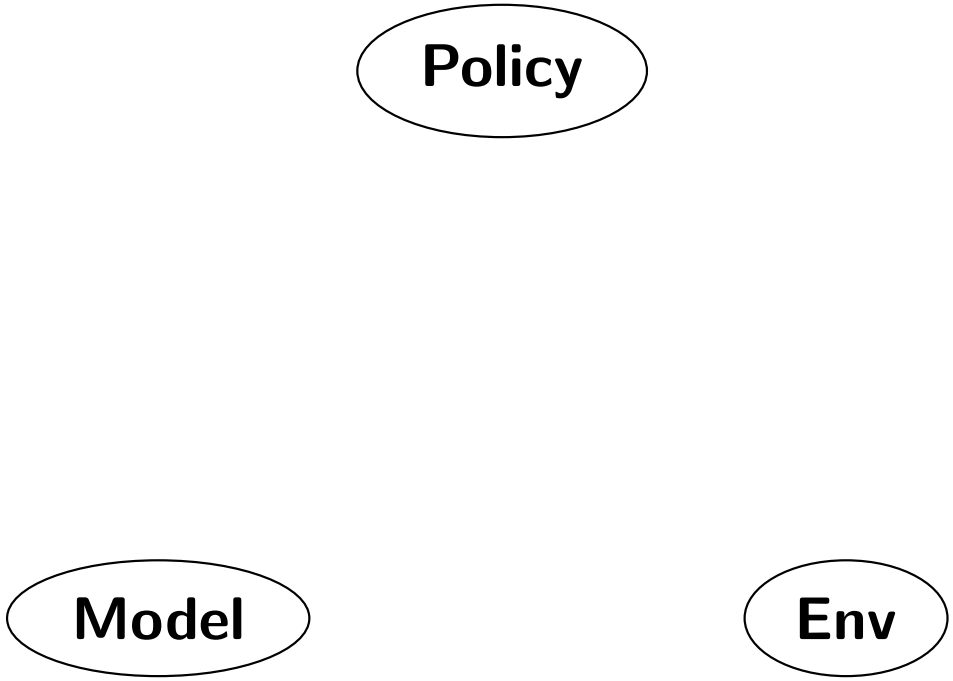

Figure: Planning-Learning

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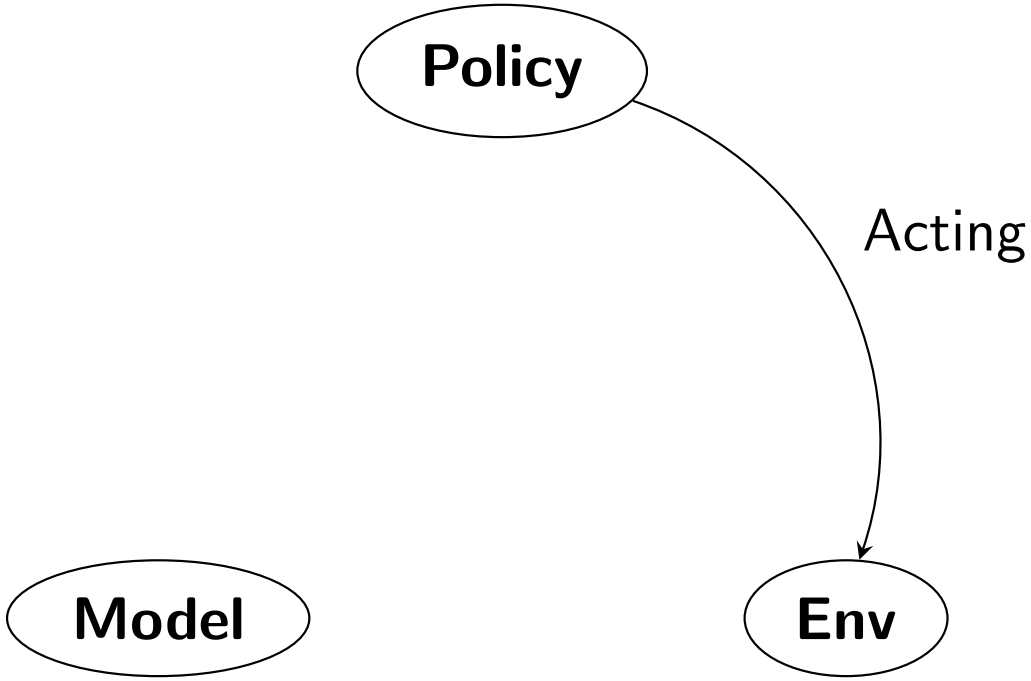

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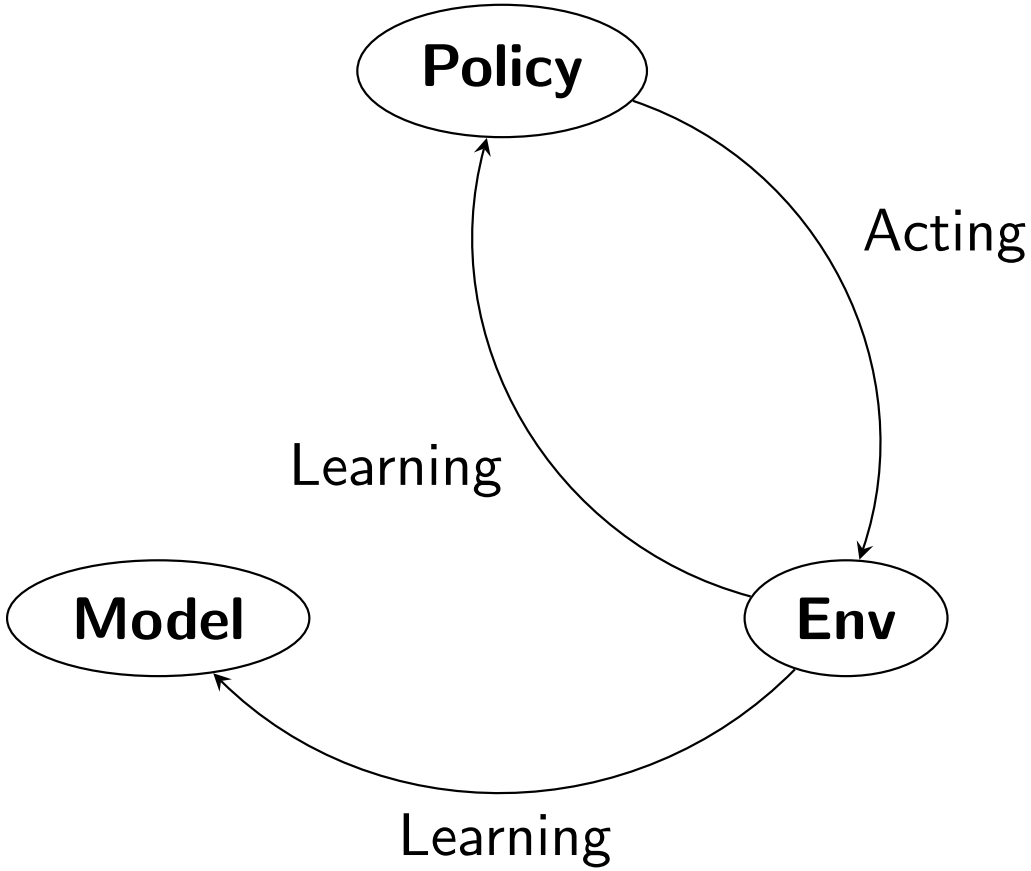

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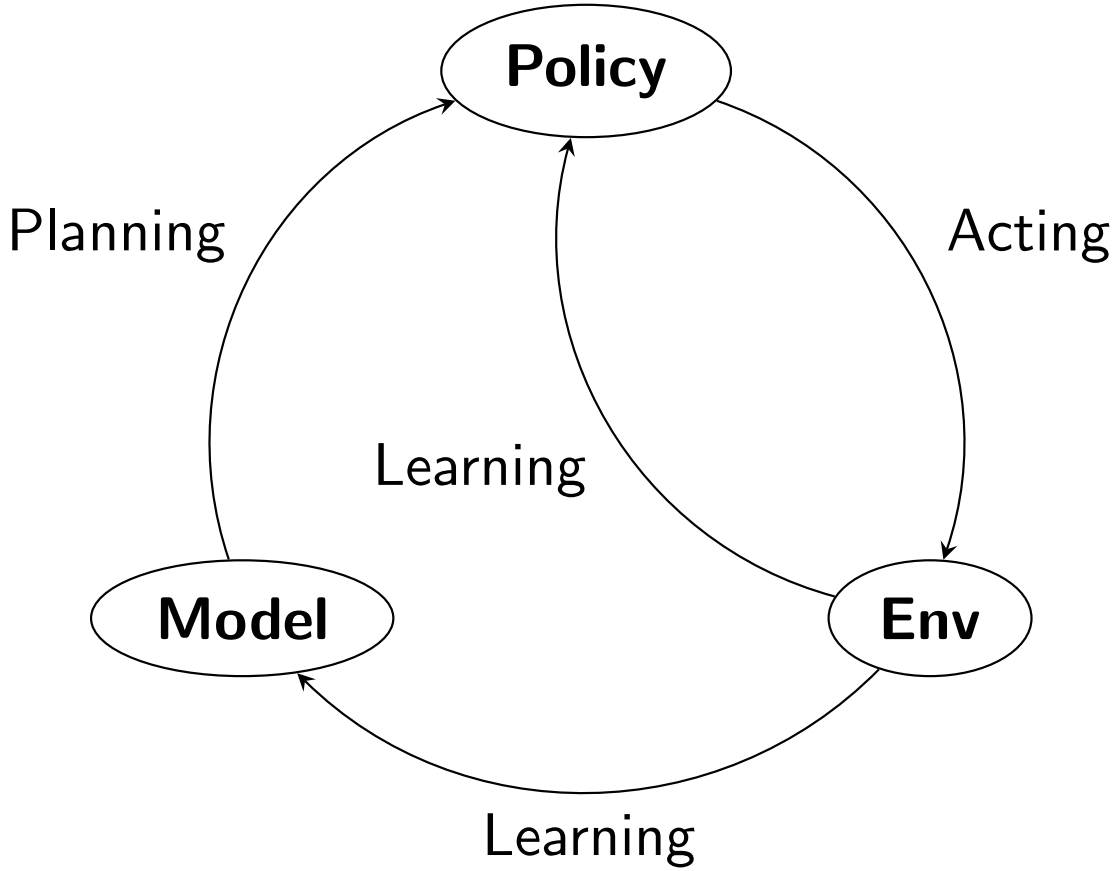

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