

# AI Lab - Session 4

## Model-Based Reinforcement Learning

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Start the previously installed (Session 1) conda environment *ai-lab*

## Listing 1: Upgrade and spin up

```
cd ai-lab  
git pull  
conda activate ai-lab  
jupyter notebook
```

To open the tutorial navigate with your browser to:  
*session4/session4\_tutorial.ipynb*

- Your assignments for this session are at: *session4/session4\_mbrl.ipynb*. You will be required to implement model-based reinforcement learning
- In the following you can find the pseudocode

**Input:** *environment*  $[A, S]$ , *episodes*, *ep\_limit*, *vmaxiters*,  $\gamma$ ,  $\delta$

**Output:** *policy*, *rewards*, *lengths*

- 1: Initialize  $\hat{T}, \hat{R}, \pi$
- 2:  $rewards, lengths \leftarrow [0, \dots, 0]$  ▷ Null vectors of length *episodes*
- 3: **for** *episodes* times **do**
- 4:   Execute  $\pi$  for *ep\_limit* steps or until episode ends
- 5:   Acquire a sequence of tuples  $(s, a, s', r)$
- 6:   Update  $\hat{T}, \hat{R}, rewards, lengths$  accordingly
- 7:    $environment.T \leftarrow \hat{T}$
- 8:    $environment.R \leftarrow \hat{R}$
- 9:    $\pi \leftarrow \text{VALUE\_ITERATION}(environment, vmaxiters, \gamma, \delta)$
- 10: **return**  $\pi, rewards, lengths$