

Exercise 1

A robot manipulator is equipped with a tactile sensor in its gripper. When the robot is commanded to grasp an object, if the object was not already grasped it succeeds with 0.7 probabilities but fails with a 0.3 probability, otherwise it continues grasping the object with 0.9 probability but can fail with 0.1 probability.

Whenever an object is hold within the gripper, the tactile sensor detects the situation with a 0.6 probability but fails in the detection with a 0.4 probability.

If the gripper is free, the tactile sensor detects the situation with 0.8 probability but fails with 0.2 probability.

The following sequence of actions/sensor readings have been executed:

- 1) The action GRASP is executed
- 2) The tactile sensor detects NO OBJECT GRASPED.

- **Fill the table** with the evolution of the robot belief of having grasped (or not) the object.
- Please **detail** outside the table **all the steps** you performed to arrive to the solution.

Executed action	Probability of OBJECT GRASPED	Probability of NO OBJECT GRASPED
	0.5 (<i>Initial guess</i>)	0.5 (<i>Initial guess</i>)
$u_t = \text{GRASP THE OBJECT}$		
$z_t = \text{NO OBJECT GRASPED}$		