

Introduction to Machine Learning
Exam D
2024.01.08.

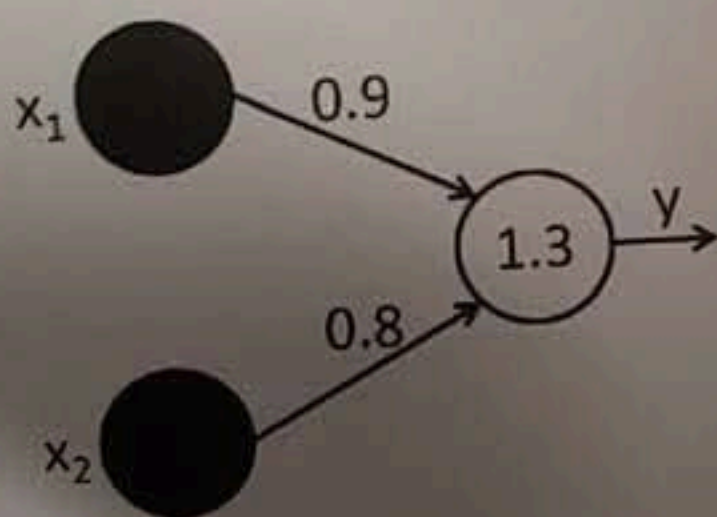
(15 points) What is the key concept of the reinforcement learning method? Draw a figure to introduce it. What are the main elements of a reinforcement learning task?

(15 points) In the Ant Foraging model, what will be the probability of the agent choosing the STRAIGHT_AHEAD direction, if the amount of pheromone it senses in each of the three directions is the following:

LEFT	STRAIGHT_AHEAD	RIGHT
10	10	80

3. (15 points) Please explain the working mechanism of decision trees.

4. (30 points) Which logic function is implemented by the following Perceptron for the inputs x_1 and x_2 ? (The values written in the arrows are weights and the value written in the neuron is the threshold.) How would you modify the weights and the threshold to make the Perceptron implement the NAND logic function? (Hint: the values cannot be only positive). Justify your answer.



5. (10 points) What are the three main fields of Machine Learning?

6. (15 points) What are the main steps of training a policy gradient algorithm?