Basics of Deep Learning

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1 Introduction

2 Deep Learning problem

3 Deep Learning application

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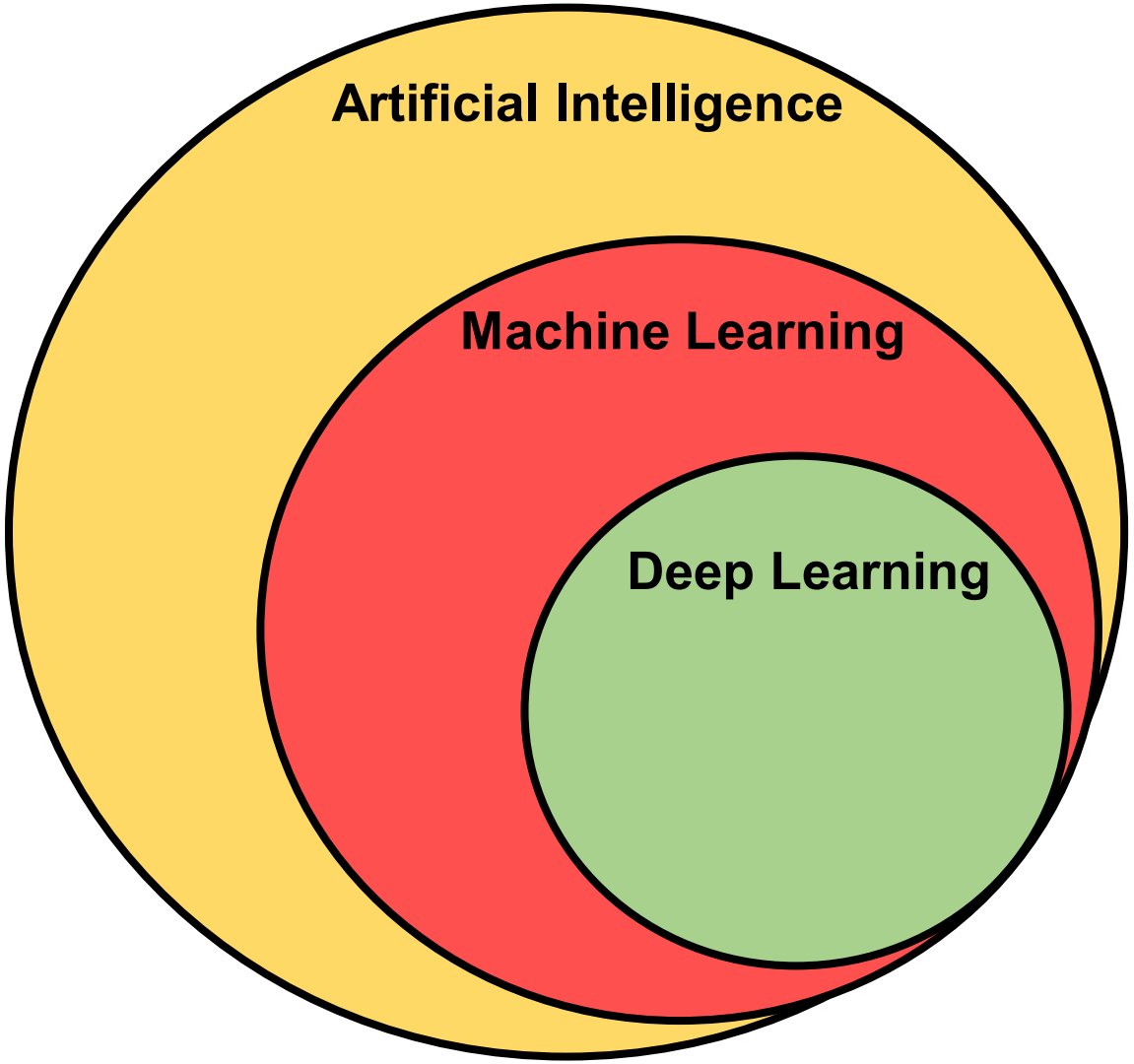
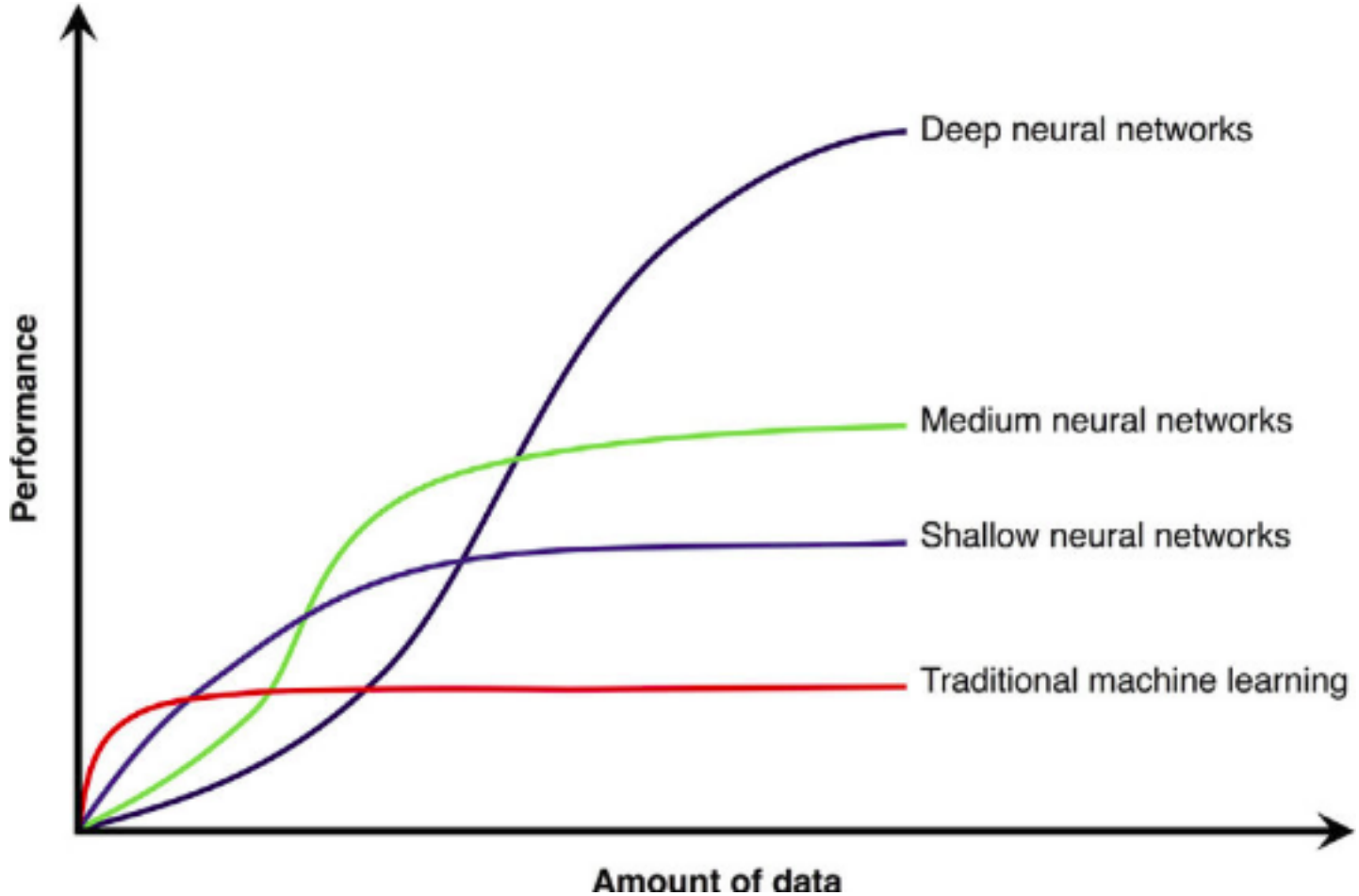
1 Where is DL in AI world?



- **Artificial Intelligence (AI)** – give the capability of learning, thinking or solving problems to a machine
- **Machine Learning (ML)** – machines recognize patterns without been explicitly programmed
- **Deep Learning (DL)** – machines recognize patterns reproducing how the brain works

1 Why is DL taking off?



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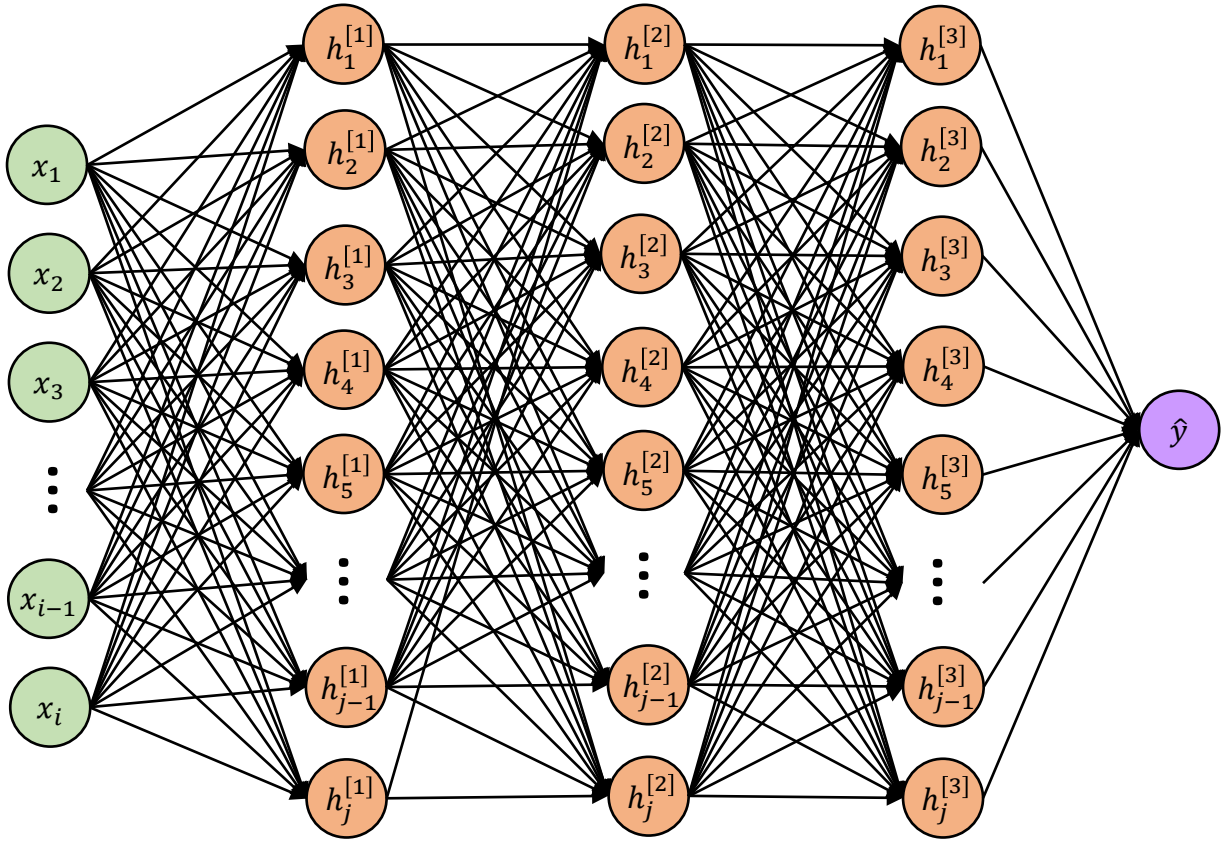
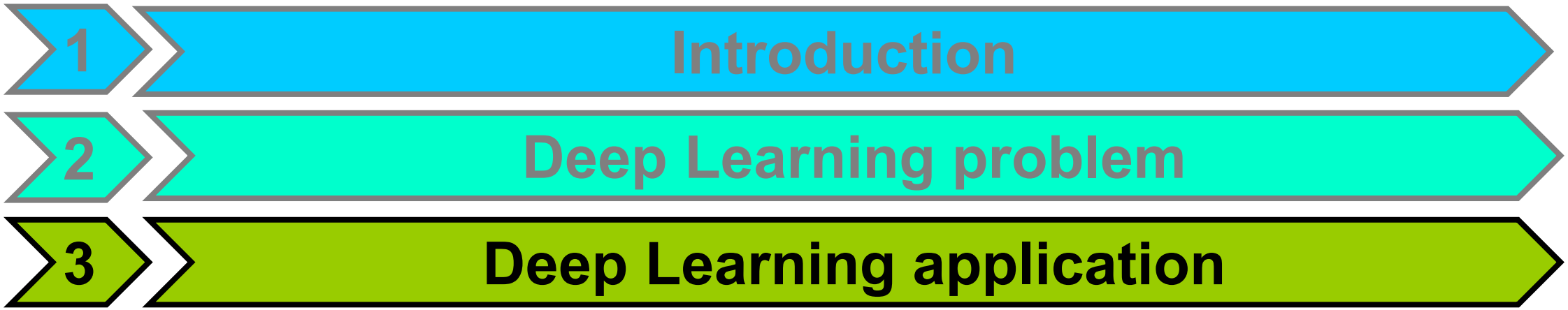
2 How is the DL structure?



- x_i – input neurons
- $h_j^{[l]}$ - hidden neurons in layer l
- $\hat{y}$ – output neuron

2 Which are the variables?

Parameters	Hyperparameters
• Weights (Kernel and Bias)	• Optimizer • Number of hidden layers • Number of hidden neurons • Activation functions • Epochs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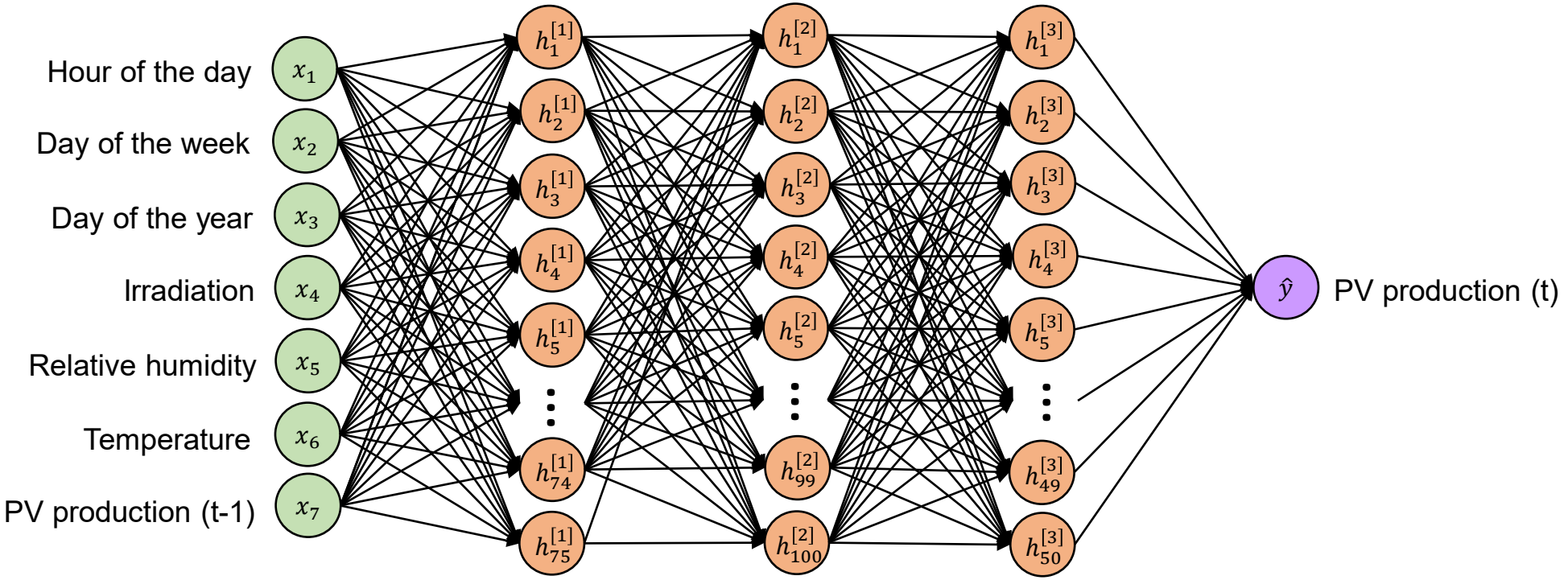
3 A real case: prediction of PV production

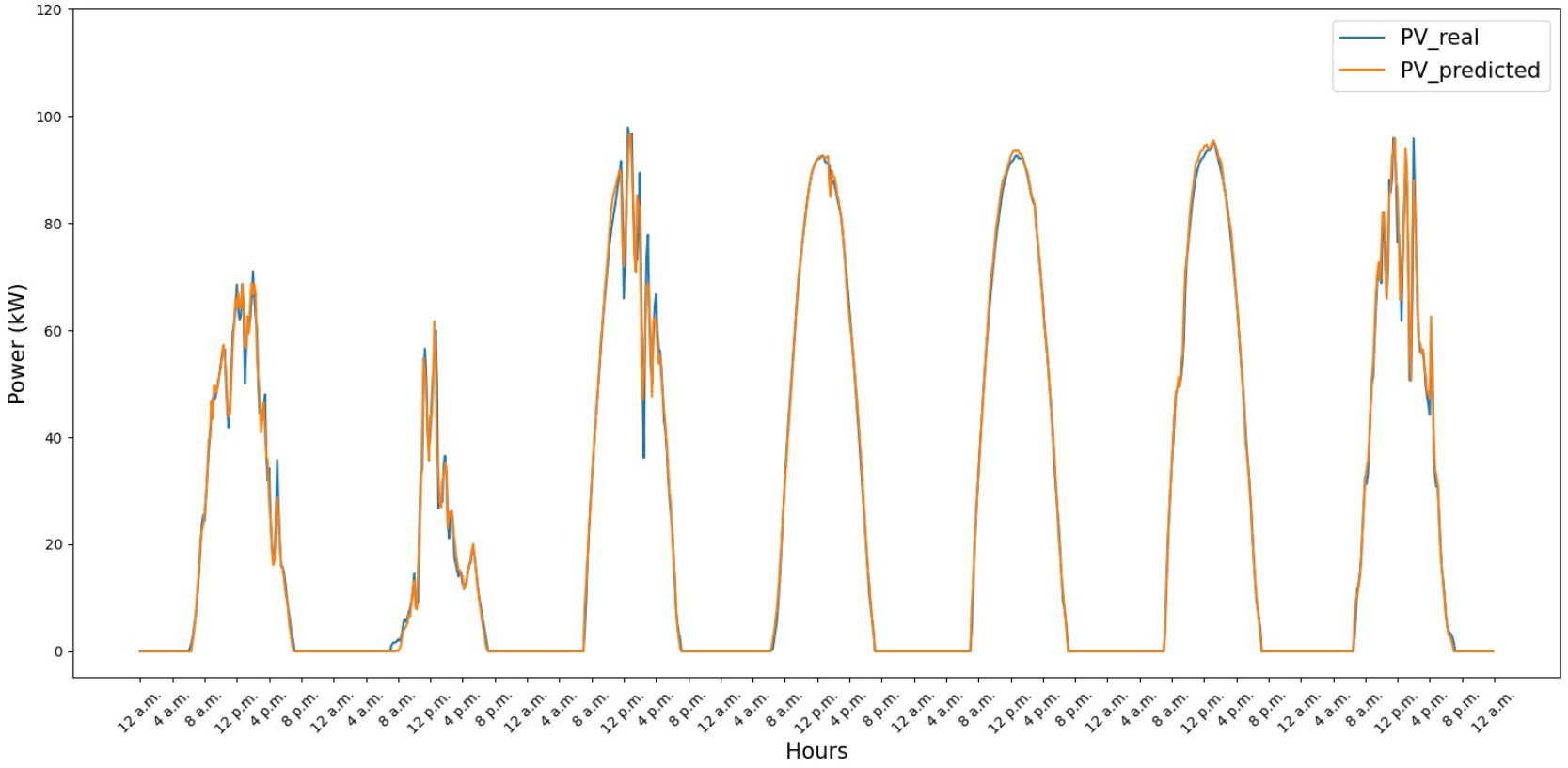


Activation functions	ReLU	ReLU	Linear	tanh

Other hyperparameters :

- Epochs: 5,000
- Optimizer: Adam with a learning rate of 0.001

3 Is it a good model?



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