



**ML for Nerds**

# Neural Networks from Scratch

ML For Nerds

# Neural Networks from Scratch

ML For Nerds

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation -- Gradient Descent
- ▶ Optimizers -- SGD, ADAM, RMSPROP etc.,

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation -- Gradient Descent
- ▶ Optimizers -- SGD, ADAM, RMSPROP etc.,
- ▶ Training of NN

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation -- Gradient Descent
- ▶ Optimizers -- SGD, ADAM, RMSPROP etc.,
- ▶ Training of NN -- training loop, saving the model etc.,
- ▶ Evaluation

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation -- Gradient Descent
- ▶ Optimizers -- SGD, ADAM, RMSPROP etc.,
- ▶ Training of NN -- training loop, saving the model etc.,
- ▶ Evaluation -- Accuracy metrics

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation -- Gradient Descent
- ▶ Optimizers -- SGD, ADAM, RMSPROP etc.,
- ▶ Training of NN -- training loop, saving the model etc.,
- ▶ Evaluation -- Accuracy metrics

# Course Curriculum

- ▶ Basics of neuron
- ▶ Neural network components --layers, weights, biases
- ▶ Neural Network operations -- vector dot products
- ▶ Activation functions -- Sigmoid, softmax, relu etc.,
- ▶ Loss functions -- MSE, cross entropy etc.,
- ▶ Back propagation -- Gradient Descent
- ▶ Optimizers -- SGD, ADAM, RMSPROP etc.,
- ▶ Training of NN -- training loop, saving the model etc.,
- ▶ Evaluation -- Accuracy metrics

# Prerequisites

- ▶ Python
- ▶ Basics of Linear Algebra
- ▶ Partial derivatives

# Tools

- ▶ Python
- ▶ Numpy