

Interactive Regression (TensorFlow.js)

C:\Users\sujal\OneDrive\Desktop\Code\mlt\lab\_CM23005\Linear%20Regression%20with%20Synthetic%20Data\Lab%20Assingment%201\index.html

## Linear Regression (TensorFlow.js)

Open console and type: `addPoint(x, y)`

Equation:  $y = 1.97x + 0.30$   
MSE: 0.0209  
Points: 7

Warning: Don't paste code into the DevTools Console that you don't understand or haven't reviewed yourself. This could allow attackers to steal your identity or take control of your computer. Please type 'allow pasting' below and press Enter to allow pasting.

allow pasting

> addPoint(6, 12.1)  
addPoint(7, 14.2)  
Point added: (6, 12.1)  
Point added: (7, 14.2)  
Re-trained with 7 points

Uncaught (in promise) TypeError: Cannot read properties of undefined (reading 'backend')  
Re-trained with 7 points

Learning Rate Analysis (TensorFlow.js)

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## 2. Experiment with Learning Rates & Convergence

Open Console (F12) and type: `testLR(0.01)`

> Console ready. Try `testLR(0.001)`, `testLR(0.01)`, `testLR(0.1)`  
[LR 0.001] Converging, Final Loss: 40.5154  
[LR 0.01] Converging, Final Loss: 0.0271

Epoch 2 | Loss = 10.2649  
Epoch 3 | Loss = 5.9953  
Epoch 4 | Loss = 3.5070  
Epoch 5 | Loss = 2.0569  
Epoch 6 | Loss = 1.2118  
Epoch 7 | Loss = 0.7192  
Epoch 8 | Loss = 0.4320  
Epoch 9 | Loss = 0.2646  
Epoch 10 | Loss = 0.1670  
Epoch 11 | Loss = 0.1100  
Epoch 12 | Loss = 0.0767  
Epoch 13 | Loss = 0.0572  
Epoch 14 | Loss = 0.0457  
Epoch 15 | Loss = 0.0390  
Epoch 16 | Loss = 0.0350  
Epoch 17 | Loss = 0.0325  
Epoch 18 | Loss = 0.0310  
Epoch 19 | Loss = 0.0301  
Epoch 20 | Loss = 0.0295  
Epoch 21 | Loss = 0.0290  
Epoch 22 | Loss = 0.0287  
Epoch 23 | Loss = 0.0284  
Epoch 24 | Loss = 0.0281  
Epoch 25 | Loss = 0.0279  
Epoch 26 | Loss = 0.0277  
Epoch 27 | Loss = 0.0275  
Epoch 28 | Loss = 0.0273  
Epoch 29 | Loss = 0.0271  
Training Finished | Status: Converging

ML Generalization & Prediction

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### 3. Predict Unseen Inputs & Compare Results

Learned Model:  $y = 3.49x + 3.21$

Predict

Input (X)	Expected	Predicted	Error (%)
115	350.00	405.13	15.75%
21	68.00	76.61	12.66%
6	23.00	24.18	5.14%

- Console support available: `predict(x)`
- Example: `predict(6)`, `predict(10.5)`

Elements

Console

Sources

Network

Model trained

x=6, expected=23, predicted=24.18

x=21, expected=68, predicted=76.61

x=115, expected=350, predicted=405.13

Search

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