

Linear Regression

This practical demonstrates training a **Linear Regression** model on **synthetic data** using **TensorFlow.js** in the browser environment.

TensorFlow.js

Regression

Synthetic Data

Browser ML

★ Open the **Browser Developer Console** to observe model training, loss values, and prediction results.

Workflow

- 1 Generate synthetic (x, y) data
- 2 Build model using `tf.sequential()`
- 3 Train with Gradient Descent
- 4 Predict unseen values

Practical 1 • Machine Learning Tools • TensorFlow.js

```
Training started... main.js:13
Live reload enabled. index.html:191
Training completed main.js:15
Prediction for x = 6 main.js:17
Tensor tfjs@latest:17
[[11.7689905],]
```

Assignment 1

Linear Regression with Synthetic Data using TensorFlow.js. This assignment compares **actual vs predicted** values.

Open the browser console to see results.

Elements Console Sources Network >>

top Filter Default levels No Issues

```
Training Assignment 1 model... main.js:13
Live reload enabled. index.html:94
Actual Values: main.js:16
Tensor tfjs@latest:17
  [3, 6, 9, 12, 15]
Predicted Values: main.js:19
Tensor tfjs@latest:17
  [[3.1663153 ],
   [6.1026011 ],
   [9.038887  ],
   [11.975172 ],
   [14.9114571]]
> |
```

Console AI assistance What's new

Assignment 2

Analyze the effect of different **learning rates** on model convergence using TensorFlow.js.

- Check console for results with multiple learning rates.

The screenshot displays the Chrome DevTools Console with the 'Console' tab selected. The output shows the results of a TensorFlow.js training and prediction process. The training phase includes three iterations with learning rates of 0.001, 0.01, and 0.1, followed by a confirmation that live reload is enabled. The prediction phase shows three separate predictions for the input x = 6, each displaying a tensor of two values. The first prediction is approximately [10.21, 10.87], the second is approximately [11.85, 11.85], and the third is approximately [-2344, 10828].

Message	Source
Training with learning rate: 0.001	main.js:13
Training with learning rate: 0.01	main.js:13
Training with learning rate: 0.1	main.js:13
Live reload enabled.	index.html:94
Prediction for x = 6	main.js:16
Tensor [[10.2108707],]	tfjs@latest:17
Prediction for x = 6	main.js:16
Tensor [[11.8549004],]	tfjs@latest:17
Prediction for x = 6	main.js:16
Tensor [[-234410828160303100],]	tfjs@latest:17

Assignment 3

Predict values for **unseen inputs** using a trained Linear Regression model in TensorFlow.js.

[View predictions in the browser console.](#)

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```
Training model for Assignment 3... main.js:13
Live reload enabled. index.html:94
Prediction for unseen input x = 6 main.js:16
Tensor tfjs@latest:17
[[29.6653938],]
Expected value ≈ 30 main.js:19
>
```

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