# Linear Regression Using TensorFlow – Introduction

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## Overview

This assignment implements a simple linear regression model using TensorFlow. Synthetic linear data with noise is generated, then a TensorFlow v1-style computation graph is built with placeholders for inputs (X, Y), trainable parameters (W, b), and an optimizer (SGD) to minimize MSE. The model is trained for 1000 epochs with learning\_rate=0.01, and the final cost, weight, and bias are reported.

## Inputs and Outputs

Inputs: 50 synthetic (x, y) data points formed from a linear trend with added uniform noise.  
Outputs: Final training cost, learned weight (W), and bias (b). Two plots are produced: a scatter plot of the training data and a line plot showing the fitted regression line over the data.

## How to Run

1. Ensure Python 3.8+, TensorFlow (2.x OK), NumPy, and Matplotlib are installed.  
2. Run `python linear\_regression\_tf1.py`.  
3. The script prints the training cost, weight, and bias to the console and `results.txt`.  
4. The plots `training\_data.png` and `fitted\_line.png` are saved in the same directory.

## What to Submit

Submit this introduction (edited with your name/course info), your Python code, and screenshots of your plots as a zip archive. You may also include the PNGs directly.