# Practical 1

IT549 - Deep Learning

<u>Gradient Descent</u>

- **Dataset**
    - **User Dataset -** This dataset contains information on users from companies' databases. It contains information about UserID, Gender, Age, Estimated Salary, and Purchased.
    - **50_Startups -** This dataset collected data from New York, California, and Florida about 50 business Startups. The variables used in the dataset are Profit, R&D spending, Administration Spending, and Marketing Spending**.**

- **Tasks to perform**
    - **Code your own functions for Gradient descent, and Multiple linear regression**
        - **Load the dataset and define input features and the target variable.**
        - **Define the cost function to calculate the error**
        - **For each iteration, calculate the Hypothesis Value and difference from the actual value**

- **Calculate the gradient and update the parameters' values (theta values).**
- **Calculate the cost function and save the value.**

■ **Draw the contour plot considering the theta values and cost for each iteration.**

An example of such a contour plot is given below -

Contour Plot of Gradient Descent
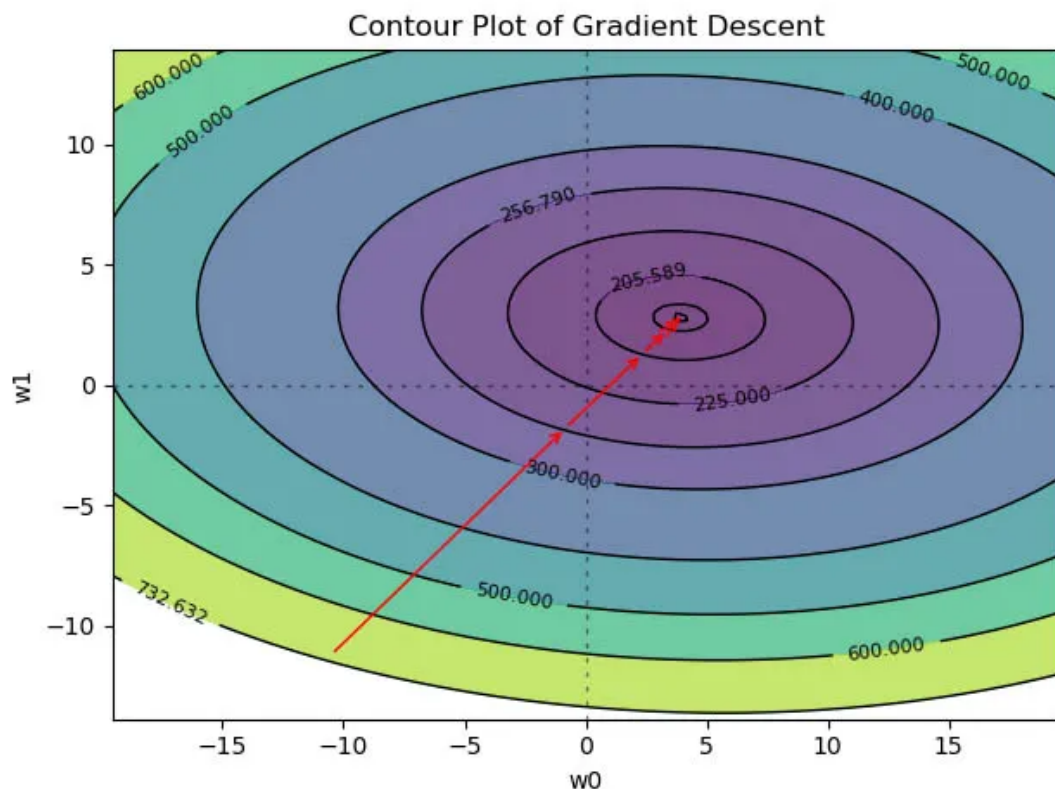
■ **Experiment with different learning rates while updating the theta values and analyze how the contour plot changes.**
■ **Use a python library (such as sklearn) to perform all these tasks.**

- **Use the User database and predict whether a user will purchase the company's newly launched product or not.**
- **Predict the profit values on the 50_startups dataset for each company.**