Experiment 1

Aim: To implement House Price Prediction - Example of Regression

Tools Used: Python

Theory: Regression in machine learning predicts a continuous output based on input variables. It models the relationship between dependent and independent variables. This lab will use a simple data set with only two data points - a house with 1000 square feet(sqft) sold for $300,000 and a house with 2000 square feet sold for $500,000. These two points will constitute our *data or training set*. In this lab, the units of size are 1000 sqft and the units of price are 1000s of dollars.

Code:

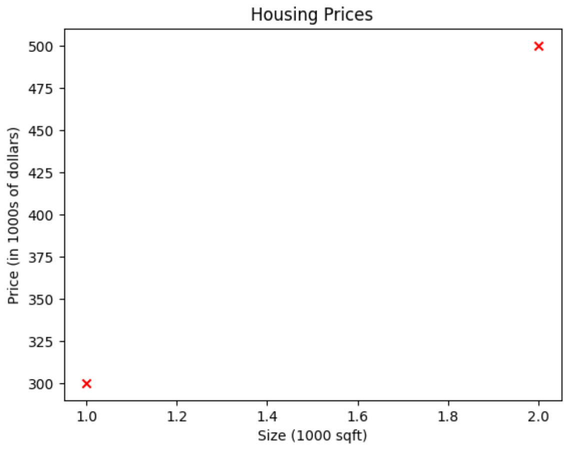
```
import numpy as np
import matplotlib.pyplot as plt
plt.style.use('./deeplearning.mplstyle')

# x_train is the input variable (size in 1000 square feet)
# y_train is the target (price in 1000s of dollars)
x_train = np.array([1.0, 2.0])
y_train = np.array([300.0, 500.0])
print(f"x_train = {x_train}")
print(f"y_train = {y_train}")

# m is the number of training examples
print(f"x_train.shape: {x_train.shape}")
m = x_train.shape[0]
print(f"Number of training examples is: {m}")

# m is the number of training examples
m = len(x_train)
print(f"Number of training examples is: {m}")

i = 0 # Change this to 1 to see (x^1, y^1)
x_i = x_train[i]
y_i = y_train[i]
print(f"(x^({i}), y^({i})) = ({x_i}, {y_i})")
```

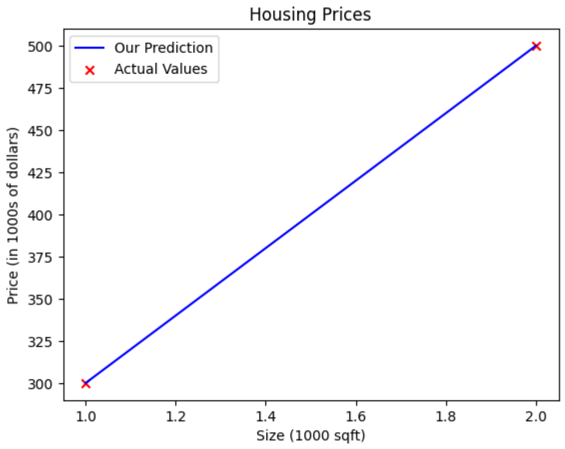
```
# Plot the data points
plt.scatter(x_train, y_train, marker='x', c='r')
# Set the title
plt.title("Housing Prices")
# Set the y-axis label
plt.ylabel('Price (in 1000s of dollars)')
# Set the x-axis label
plt.xlabel('Size (1000 sqft)')
plt.show()

w = 200
b = 100

def compute_model_output(x, w, b):
    """
    Computes the prediction of a linear model
    Args:
      x (ndarray (m,)): Data, m examples
      w,b (scalar)    : model parameters
    Returns
      f_wb (ndarray (m,)): model prediction
    """
    m = x.shape[0]
    f_wb = np.zeros(m)
    for i in range(m):
        f_wb[i] = w * x[i] + b

    return f_wb

tmp_f_wb = compute_model_output(x_train, w, b,)

# Plot our model prediction
plt.plot(x_train, tmp_f_wb, c='b',label='Our Prediction')

# Plot the data points
plt.scatter(x_train, y_train, marker='x', c='r',label='Actual Values')
```

```
# Set the title
plt.title("Housing Prices")
# Set the y-axis label
plt.ylabel('Price (in 1000s of dollars)')
# Set the x-axis label
plt.xlabel('Size (1000 sqft)')
plt.legend()
plt.show()
```

Output:

```
x_train = [1. 2.]
y_train = [300. 500.]
x_train.shape: (2,)
Number of training examples is: 2
Number of training examples is: 2
(x^(0), y^(0)) = (1.0, 300.0)
```





Result: The house market price prediction has been successfully implemented.

Criteria	Total Marks	Marks Obtained	Comments
Concept (A)			
Implementation (B)			
Performance (C)			
Total			