Experiment 3

For a dataset given

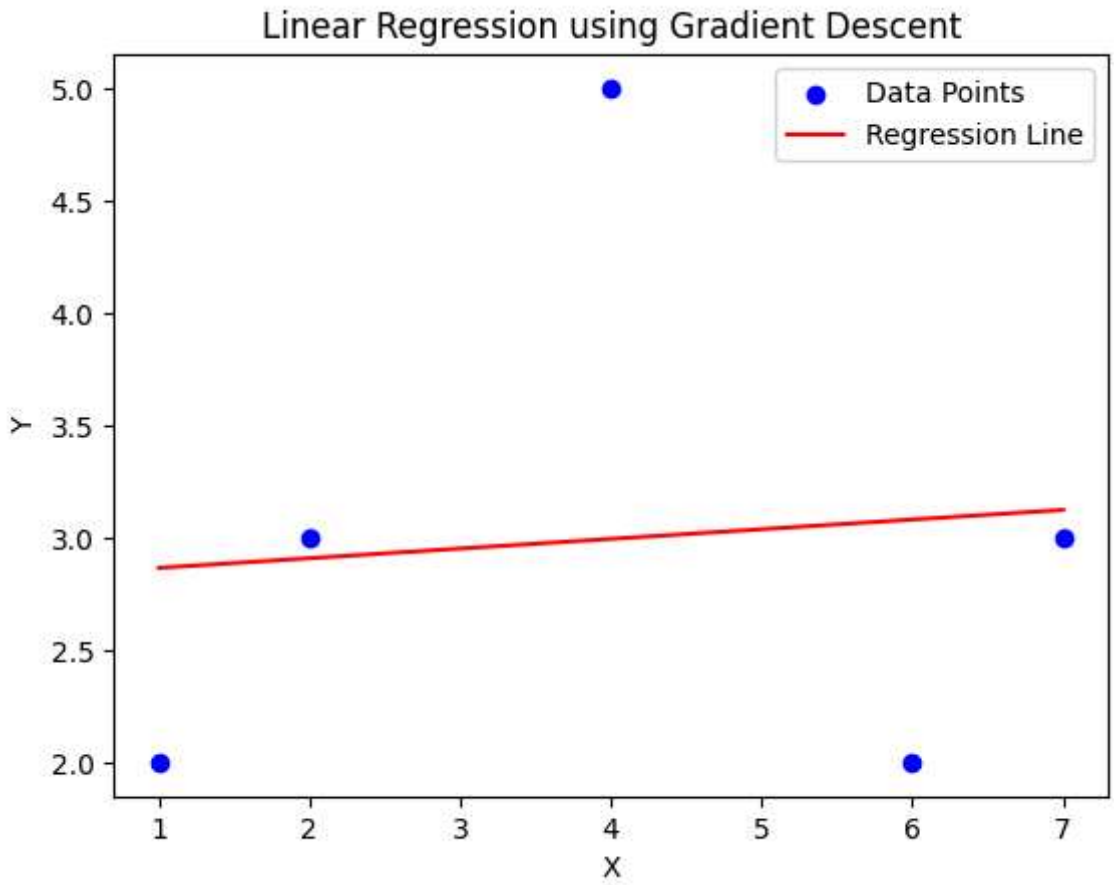
- X=[1,2,4,6,7]
- Y=[2,3,5,2,3]

write the code for linear regression using gradient descent withouth using fit function and visualtize the result

In [1]:
```
import numpy as np
import matplotlib.pyplot as plt

# initialize data
X = np.array([1,2,4,6,7])
Y = np.array([2,3,5,2,3])

# initialize parameters
m=0
c=0
alpha=0.01
epochs=1000
n=len(X)

for _ in range(epochs):
    Y_pred = m*X + c
    D_m = (-2/n) * sum(X * (Y - Y_pred))
    D_c = (-2/n) * sum(Y - Y_pred)
    m = m - alpha * D_m
    c = c - alpha * D_c

print(f"Optimized parameters: m = {m:.4f}, c = {c:.4f}")
```

```
Optimized parameters: m = 0.0430, c = 2.8224
```

In [2]:
```
# Predict Y values using the model
Y_pred = m*X + c

# Plotting the results
plt.scatter(X, Y, color='blue', label='Data Points')
plt.plot(X, Y_pred, color='red', label='Regression Line')
plt.xlabel('X')
plt.ylabel('Y')
plt.title('Linear Regression using Gradient Descent')
plt.legend()
plt.show()
```


Linear Regression using Gradient Descent
Data Points
Regression Line
5.0
4.5
4.0
3.5
3.0
2.5
2.0
Y
1
2
3
4
5
6
7
X