

NET-ID: TXT200018

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Answer 1:

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

def least_mean_sqaure(x,y):
    x_squared = [i**2 for i in x]
    xy = [a * b for a, b in zip(x, y)]
    x_sum = sum(x)
    y_sum = sum(y)
    x_squared_sum = sum(x_squared)
    xy_sum = sum(xy)

    m = ((len(x)*(xy_sum))-(x_sum*y_sum))/((len(x)*x_squared_sum)-((x_sum)**2))
    b = ((y_sum)-(m*x_sum))/(len(x))
    return m,b

q1_x = np.array([-2,1,3])
q1_y = np.array([-1,1,2])
que_1 = least_mean_sqaure(q1_x,q1_y)

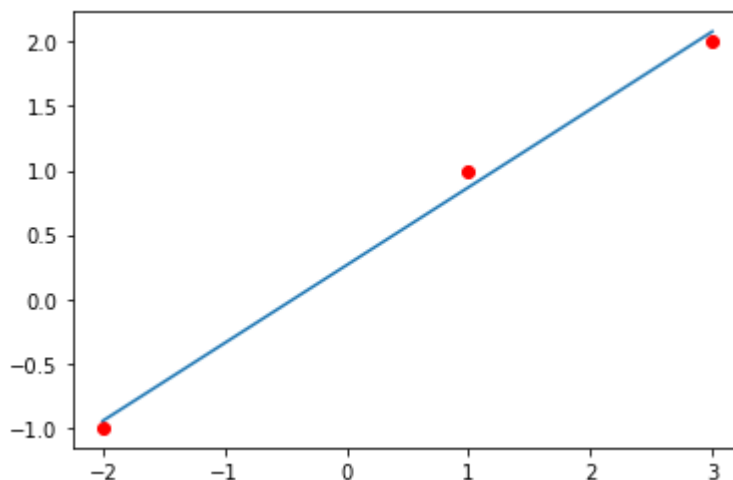
print("Answer 1(a): The least square regression line for the given data points is y = "

print("\nAnswer 1(b): ")
plt.scatter(q1_x,q1_y, c='r')
plt.plot(q1_x,que_1[0]*q1_x+que_1[1])
```

Answer 1(a): The least square regression line for the given data points is y = 0.6052631578947368 + x * 0.2631578947368421

Answer 1(b):

Out[1]: [<matplotlib.lines.Line2D at 0x19b607748d0>]



Answer 2:

In [2]:

```
q2_x = np.array([0,1,2,3,4])
q2_y = np.array([2,3,5,4,6])
que_2 = least_mean_sqaure(q2_x,q2_y)

print("Answer 2(b): The estimate value of y when x = 10 is y = " , que_2[0] + (10 * que_2[1])
plt.scatter(q2_x,q2_y, c='r')
plt.plot(q2_x,que_2[0]*q2_x+que_2[1])
print("\nAnswer 2(a)")
```

Answer 2(b): The estimate value of y when x = 10 is y = 22.9

Answer 2(a)

