Ronish Shrestha(19707)
MATH208- Hw2

1.

2.

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```python
    # Check if the inequality holds
    inequality_verified = prob >= (1 - 1/(k**2))

    print(f"Probability of |X-u| = {prob} ; 1-1/(k^2) = {1 - 1/(k**2)}")
    print(f"When k = {k} , P(|X-u| < k*sd) >= 1-1/k^2 is {inequality_verifi

    return count

 Test cases
andom_numbers = create_random_numbers(50)

_values = [1, 2**0.5, 1.5, 2, 3]
or k in k_values:
    cnt = verify_Chebyshev_ineq(random_numbers, k)
```

```
Probability of |X-u| = 0.58 ; 1-1/(k^2) = 0.0
When k = 1 , P(|X-u| < k*sd) >= 1-1/k^2 is True

Probability of |X-u| = 0.8 ; 1-1/(k^2) = 0.5000000000000001
When k = 1.4142135623730951 , P(|X-u| < k*sd) >= 1-1/k^2 is True

Probability of |X-u| = 0.84 ; 1-1/(k^2) = 0.5555555555555556
When k = 1.5 , P(|X-u| < k*sd) >= 1-1/k^2 is True

Probability of |X-u| = 1.0 ; 1-1/(k^2) = 0.75
When k = 2 , P(|X-u| < k*sd) >= 1-1/k^2 is True

Probability of |X-u| = 1.0 ; 1-1/(k^2) = 0.8888888888888888
When k = 3 , P(|X-u| < k*sd) >= 1-1/k^2 is True
```

3.

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```
slope (b1) = 141.21212121212122
y-intercept(b0) = -466.8787878787879
Coefficient of linear correlation r = 0.943579551890278
```


Linear Regression Fit
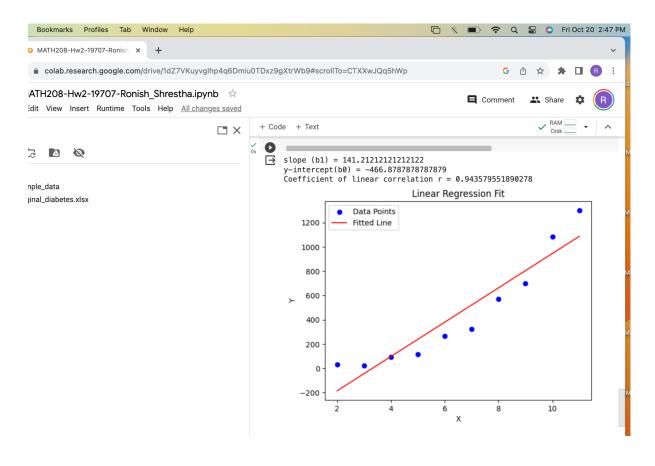
Yes, when the coefficient of linear correlation (r) is very close to +1, it indicates a strong positive linear relationship between the variables. In such cases, a linear model is a good fit for the dataset, and it suggests that there is a strong linear association between the predictor variable (X) and the response variable (Y).