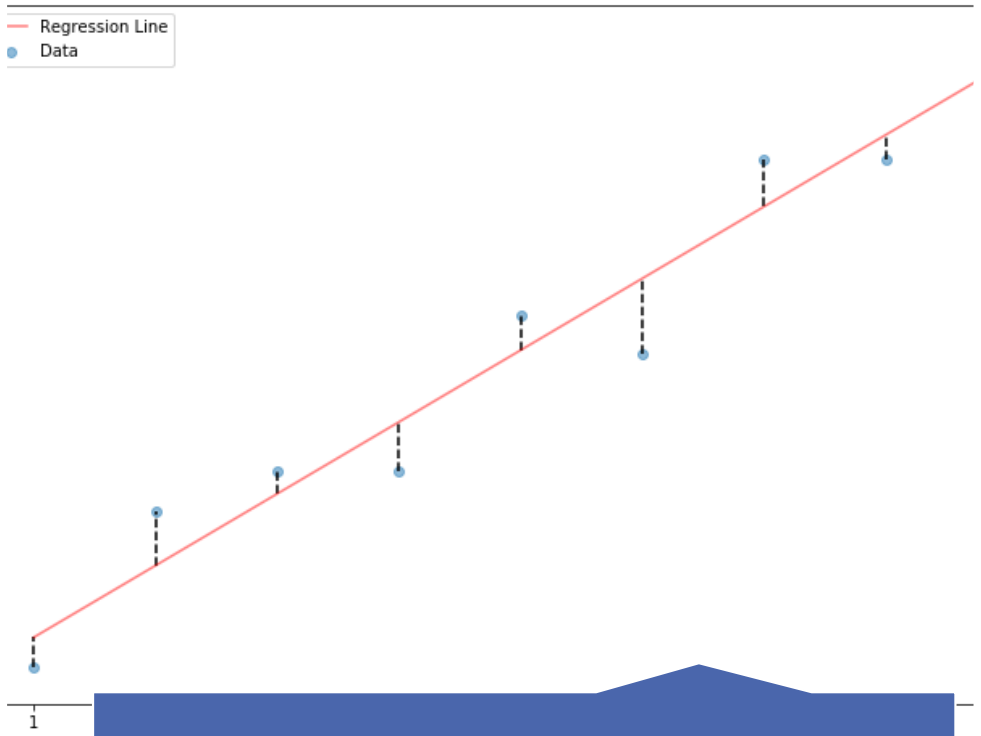
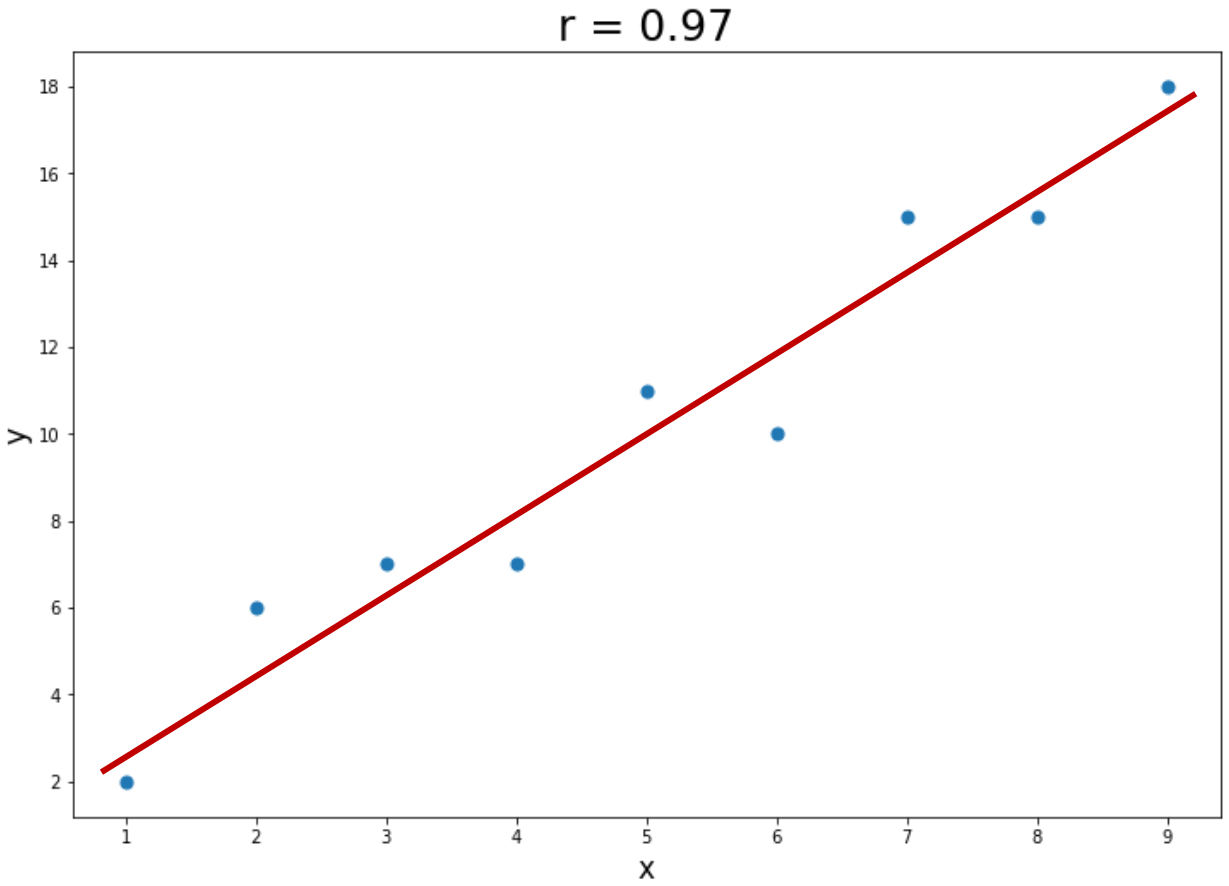
# Regression Analysis – Hypothesis Testing



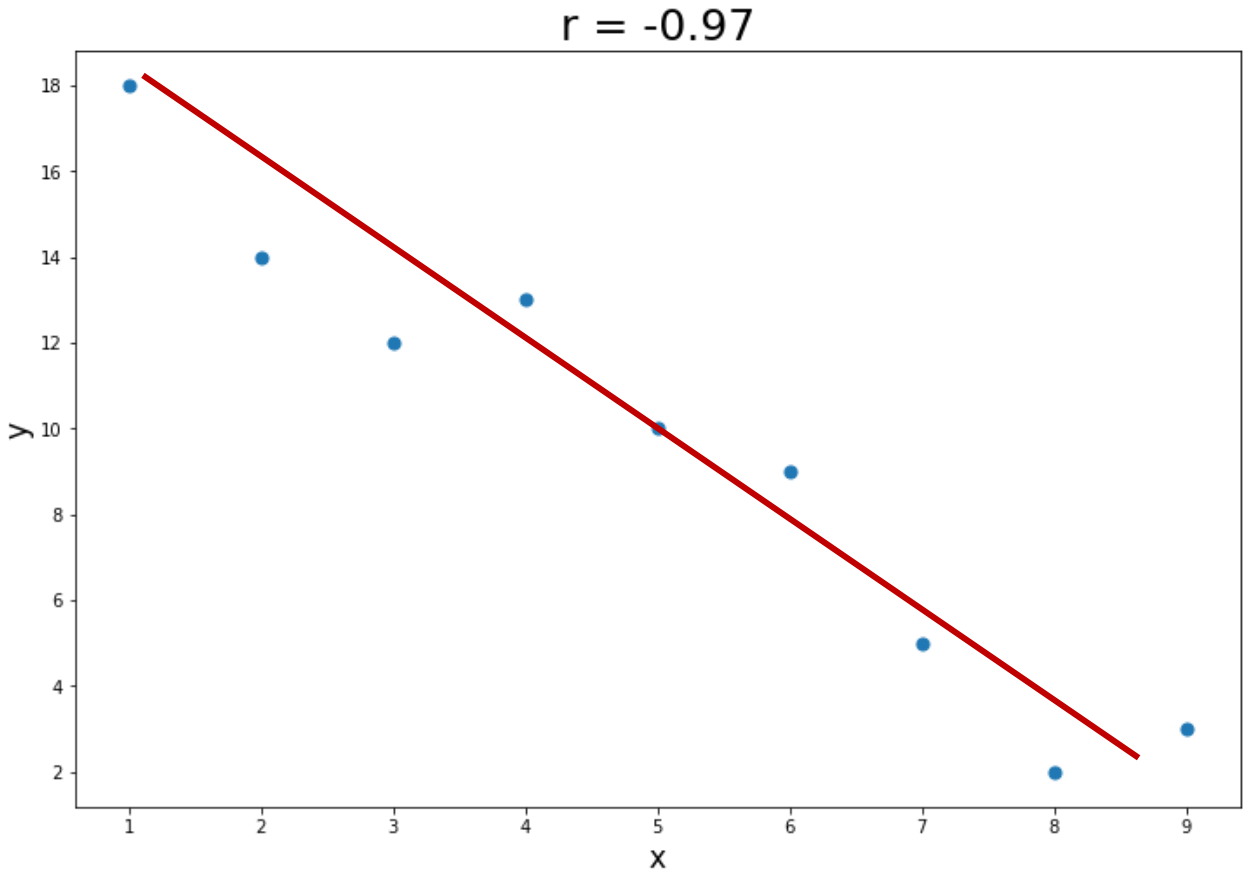

Is the independent Variable statistically significant?

## Hypothesis Testing

# Regression – positive Slope Coefficient



# Regression – negative Slope Coefficient

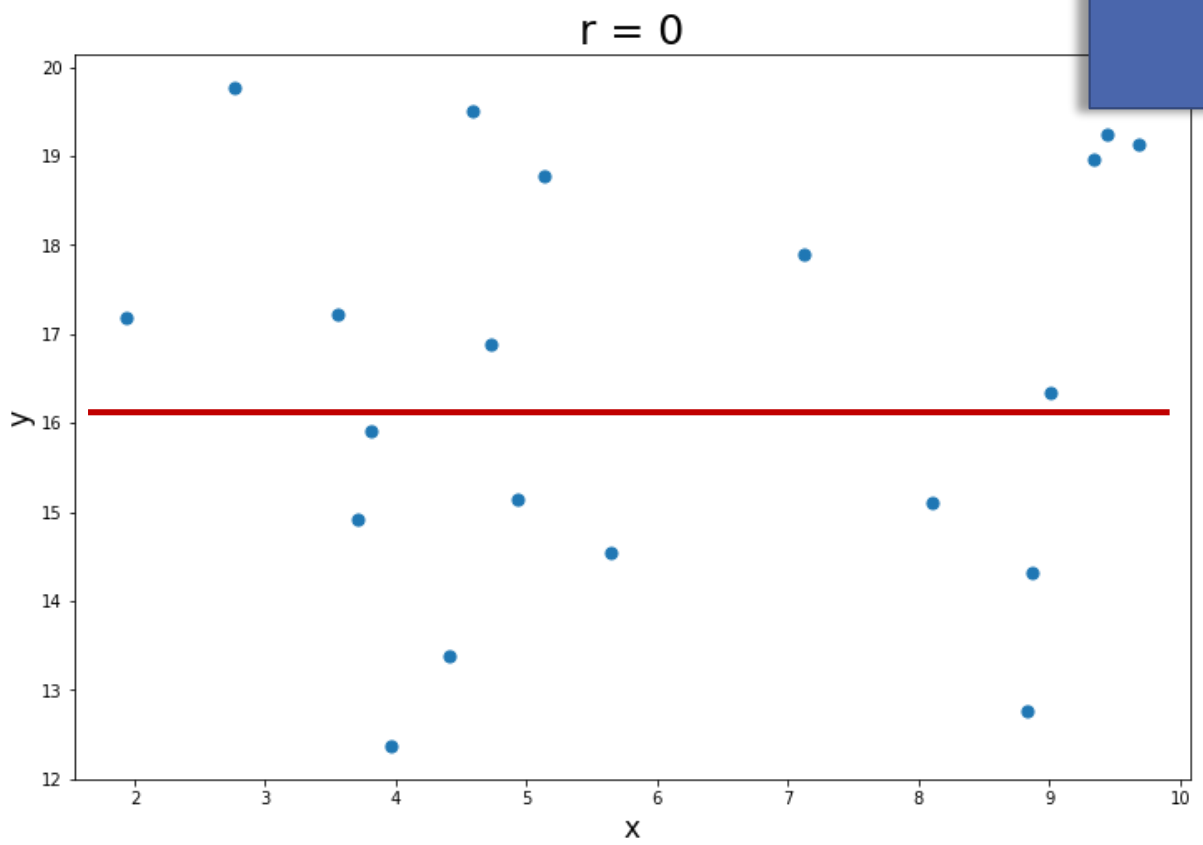


# Regression – Slope Coefficient == 0

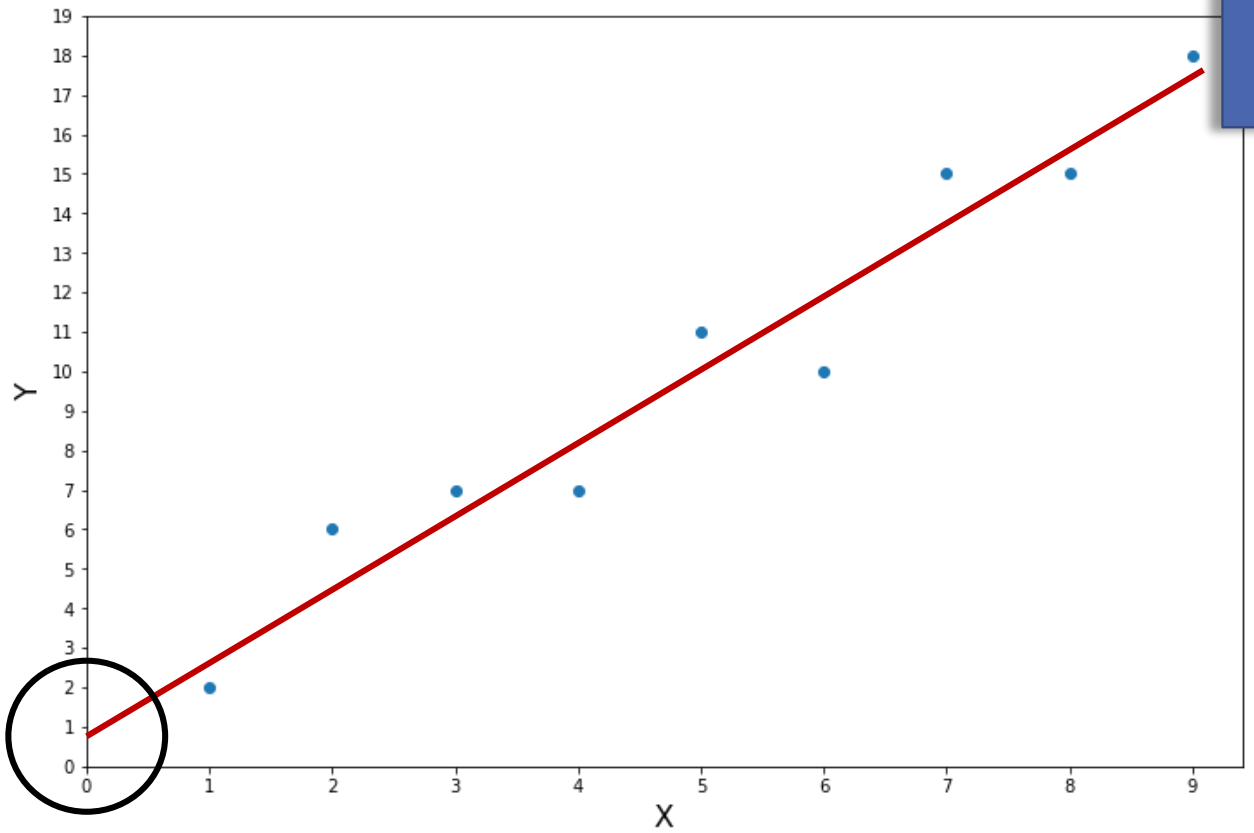
Statistical Test of Significance (t-Test):

$$H_0: b = 0$$

$$H_a: b \neq 0$$



# Regression – Intercept Coefficient




Statistical Test of Significance (t-Test):

$$H_0: a = 0$$

$$H_a: a \neq 0$$

# Recap: level of significance & p-value

**Rule of Thumb**

p-value < 1%
→ independent variable is significant

## Significance Level (α)

- Probability of rejecting $H_0$ when it is true. (Type I Error)
- Decreasing α lowers probability of Type I Error…
- …but increases the probability of Type II Error (not rejecting $H_0$ when it´s false)…

## p-value

- the p-value is the probability of obtaining coefficients at least as extreme as the coefficients actually observed during the test, assuming that H0 is correct.
- the p-value is the smallest level of significance for which H0 can be rejected.