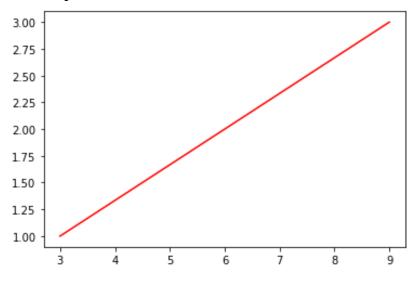
Classical Data Analysis. Linear Regression Test

- 1) Which of the following problems cannot be modeled as a regression problem?
 - a. Predict the value (price) of a car based on its characteristic;
 - b. Predict the volume of gas that will be consumed in the next two months;
 - c. Predict if a car will be sold within the next 3 months.
 - d. None of the above problems can be modeled as a regression problem.
- 2) Consider the following dataset:

X	у
3	1
6	2
12	4
30	10

Considering the linear regression model f(x) = a + b*x, what are the values of a and b you would expect to better fit the data?

- a. a=0, b=0
- b. a=3, b=0
- c. a=1, b=3
- d. a=0, b=1/3
- 3) Which of the following linear model correspond to that represented in the plot?



a.
$$y= 1+3*x$$

b. $y= (1/3)*x$

- c. y= 3/x
- d. None of the above
- 4) Considering the linear regression model y = a + b*x, which is the dependent variable and which is the independent variable?
 - a. y and x are both dependent
 - b. y is the dependent variable and x is the independent variable
 - c. x is the dependent variable and y is the independent variable
 - d. None of the above
- 5) In the linear regression model f(x) = 5+6*x which is the intercept and which is the slope of the model?
 - a. 5 is the intercept, 6 is the slope
 - b. 6 is the intercept, 5 is the slope
 - c. The intercept is 0 and the slope is 5/6
- 6) In the linear regression model of the exercise 3, is there a relationship between the dependent and the independent variable?
 - a. Yes, there is a negative relationship
 - b. No, there is no relationship
 - c. Yes, there is a positive relationship
- 7) If you represent your linear model through a linear function having a negative slope, the relationship between the dependent variable and the independent variable will be:
 - a. The is no relationship between the variables
 - b. I don't have enough information to reply
 - c. There will be a negative relationship between dependent and independent variables.
 - d. There will be a positive relationship between dependent and independent variables.
- 8) Suppose we set a=-1 and b=5. If your linear model is f(x) = a + b * x, which is the value of f(5)?
 - a. 25
 - b. 24
 - c. 26
 - d. There are not enough information to compute that value
- 9) Which of the following metrics can be used to evaluate regression models (multiple choices):
 - a. R Squared
 - b. RMSE/MSE/MAE
 - c. nDCG
 - d. Accuracy
 - e. F Statistics
- 10) What are the units of Mean Absolute Error (MAE)?
 - a. The same units as your target variable (the Y).
 - b. It is just an error, it does not have units.

- c. The units of the target squared.
- d. None of the above.
- 11) How many parameters do you need to estimate in a univariate (one independent variable) linear regression model?
 - a. 1
 - b. 2
 - c. 0
 - d. 3
- 12) In a simple linear regression model (one independent variable) y = 2+0.5*x, if we change the input variable by 1 unit, which is the change expected in the output variable? (Multiple choices)
 - a. 0.5
 - b. 1 unit
 - c. the value of the slope
 - d. the value of the intercept
- 13) Suppose to run the following python code:

$$x = 2 - 3 * np.random.normal(0, 1, 20)$$

$$y = x - 2 * (x ** 2) + 0.5 * (x ** 3) + np.random.normal(-3, 3, 20)$$

- 14) Which model would you expect would fit best the data points?
 - a. $f(x) = -3 + 3x 5x^2 + x^3 + 3x^4$
 - b. f(x) = -3 + 4x
 - c. $f(x) = -3 + x 2x^2 + 0.5x^3$
 - d. $f(x) = -3 + x 2x^2 + 5x^3$
- 15) What does the intercept represent in a regression linear model?
 - a. the expected mean value of y when x=0.
 - b. A measure of the relationship between x and y
 - c. the expected mean value of x when y=0.
 - d. None of the above