

Assignment 2

File 2 (Solution)

21). When implementing linear regression of some dependent variable y on the set of independent variables $\mathbf{x} = (x_1, \dots, x_r)$, where r is the number of predictors, which of the following statements will be true?

- a) $\beta_0, \beta_1, \dots, \beta_r$ are the **regression coefficients**.
- b) Linear regression is about determining the **best predicted weights** by using the **method of ordinary least squares**.
- c) E is the random interval
- d) Both a and b

Answer: a) $\beta_0, \beta_1, \dots, \beta_r$ are the regression coefficients.

22). What indicates that you have a **perfect fit** in linear regression?

- a) The value $R^2 < 1$, which corresponds to $SSR = 0$
- b) The value $R^2 = 0$, which corresponds to $SSR = 1$
- c) The value $R^2 > 0$, which corresponds to $SSR = 1$
- d) The value $R^2 = 1$, which corresponds to $SSR = 0$

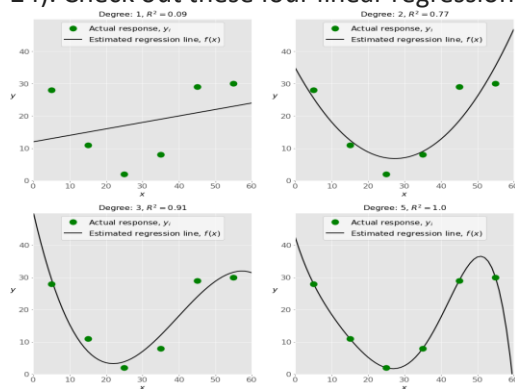
Answer: d) The value $R^2 = 1$, which corresponds to $SSR = 0$

23). In simple linear regression, the value of **what** shows the point where the estimated regression line crosses the y axis?

- a) Y
- b) B_0
- c) B_1
- d) F

Answer: a) Y

24). Check out these four linear regression plots:



Which one represents an **underfitted** model?

- a) The bottom-left plot
- b) The top-right plot
- c) The bottom-right plot
- d) The top-left plot

Answer: a) The bottom-left plot

- 25). There are five basic steps when you're implementing linear regression:
- a. Check the results of model fitting to know whether the model is satisfactory.
 - b. Provide data to work with, and eventually do appropriate transformations.
 - c. Apply the model for predictions.
 - d. Import the packages and classes that you need.
 - e. Create a regression model and fit it with existing data.

However, those steps are currently listed in the wrong order. What's the correct order?

- a) e, c, a, b, d
- b) e, d, b, a, c
- c) d, e, c, b, a
- d) d, b, e, a, c

Answer: c) d, e, c, b, a

- 26). Which of the following are optional parameters to LinearRegression in scikit-learn?

- a) Fit
- b) fit_intercept
- c) normalize
- d) copy_X
- e) n_jobs
- f) reshape

Answer:

- b) fit_intercept**
- c) normalize**
- d) copy_X**
- e) n_jobs**

- 27). While working with scikit-learn, in which type of regression do you need to transform the array of inputs to include nonlinear terms such as x^2 ?

- a) Multiple linear regression
- b) Simple linear regression
- c) Polynomial regression

Answer: c) Polynomial regression

- 28). You should choose statsmodels over scikit-learn when:

- A) You want graphical representations of your data.
- b) You're working with nonlinear terms.
- c) You need more detailed results.
- d) You need to include optional parameters.

Answer: c) You need more detailed results.

29). _____ is a fundamental package for scientific computing with Python. It offers comprehensive mathematical functions, random number generators, linear algebra routines, Fourier transforms, and more. It provides a high-level syntax that makes it accessible and productive.

- a) Pandas
- b) Numpy
- c) Statsmodel
- d) scipy

Answer: b) Numpy

30). _____ is a Python data visualization library based on Matplotlib. It provides a high-level interface for drawing attractive and informative statistical graphics that allow you to explore and understand your data. It integrates closely with pandas data structures.

- a) Bokeh
- b) Seaborn
- c) Matplotlib
- d) Dash

Answer: b) Seaborn