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

a) $\beta_0, \beta_1, \ldots, \beta_r$ 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

$\beta_0, \beta_1, \ldots, \beta_r$ are the regression coefficients and Linear regression is about determining the best predicted weights by using the method of ordinary least squares

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

The value $R^2 = 1$ corresponds to SSR = 0. That's the **perfect fit** and shows that the values of predicted and actual responses fit completely to each other**.**

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

a) Y

b) B0

c) B1

d) F

The value of B0, also known as the intercept, shows the point where the estimated regression line crosses the y axis.

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

The top-left plot shows a linear regression line that has a low R^2 value of 0. 09.This is an example of underfitting.

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

The answer is d

26) Which of the following are optional parameters to Linear Regression in scikit-learn?

a) Fit

b) fit_intercept

c) normalize

d) copy_X

e) n_jobs

f) reshape

The four optional parameters to Linear regression in scikit-learn are fit_intercept, normalize, copy_X and 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.

The answer is 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.

The answer is C. statmodels is desirable when 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

The answer is NumPy (B)

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

The answer is Seaborn (B)