**Assignment 2**

21**.** When implementing linear regression of some dependent variable y on the set of independent variables x = (x1, ..., xr), where r is the number of predictors, which of the following statements will be true?

a) β0, β1, ..., βr 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**

**Explanation:-** β0, β1, ..., βr are the regression coefficients. Because y= β0 + β1x1 + β3*x2…. +βr*xr here β0, β1, ..., βr are the regression coefficients. And Linear regression aims to determine the optimal weights or coefficients for the independent variables that minimize the sum of squared differences between the predicted values and the actual values. This is achieved through the method of ordinary least squares.

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

a) The value R2 < 1, which corresponds to SSR = 0

b) The value R2 = 0, which corresponds to SSR = 1

c) The value R2 > 0, which corresponds to SSR = 1

d) The value R2 = 1, which corresponds to SSR = 0

**Explanation**:- **When R2 is equal to 1, it means that SSR is equal to 0, indicating a perfect fit in linear regression.**

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

**Explanation**:- **Y=B0+B1X,where B0 is intercept that cuts y axis hence b option**

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**

**Explanation:-Because it has r2 value as 0.09 which indicates that line is poorly fitted.**

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

**Explanation:-b)e,d,b,a,c are in correct order**

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

**Explanation:-b,c,d,e option**

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 x2?

a)Multiple linear regression

b) Simple linear regression

**c) Polynomial regression**

**Expalnation:-When non linear term are added such as x**2 then the fit line is no longer linear and relation between dependent and independent variable is not linear.**

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.

**Explanation:-we can use statsmodels model for hypothesis testing and could go in detail.**

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:-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:-Seaborn**