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

a) $\beta_0, \beta_1, ..., \beta_r$ 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 d) Both a and b

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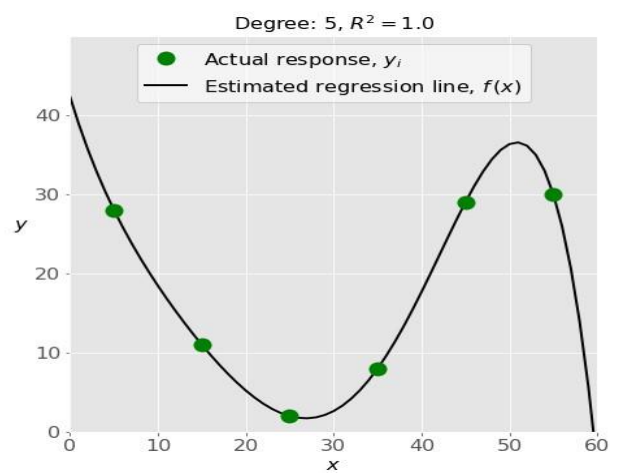d) The value $R^2 = 1$, which corresponds to SSR = 0
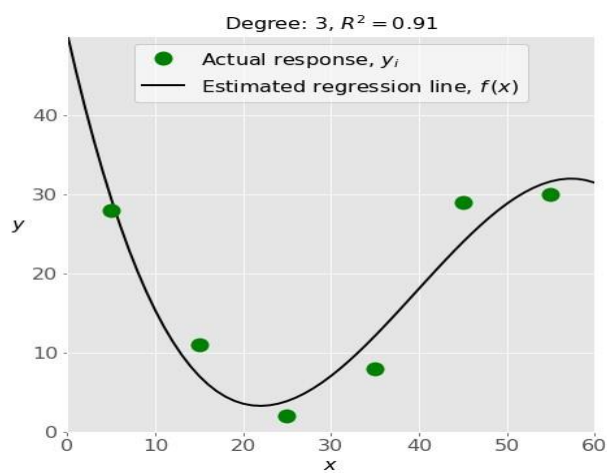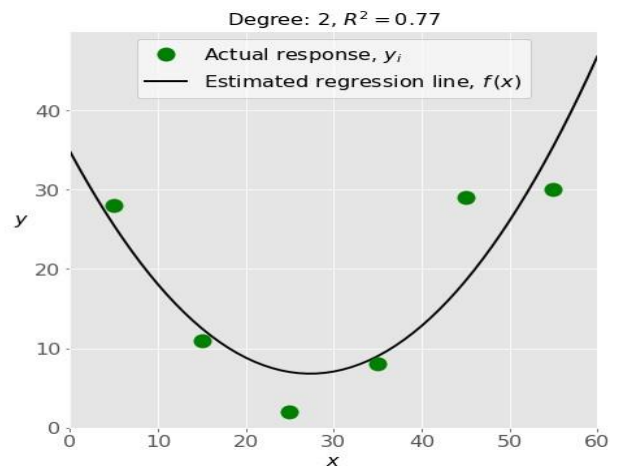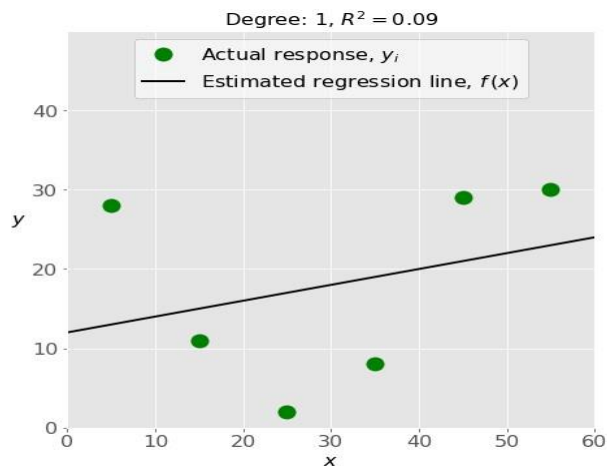
Answer d) The value $R^2 = 1$, which corresponds to SSR = 0

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

a) Y
b) B0
c) B1
d) F

Answer b) B0

24) Check out these four linear regression plots:

Degree: 1, $R^2 = 0.09$ Degree: 2, $R^2 = 0.77$

Degree: 3, $R^2 = 0.91$ Degree: 5, $R^2 = 1.0$

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

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

learn? a)

a) Fit

b) fit_intercept
c) normalize
d) copy_X
e) n_jobs
f) reshape

Answer b) fit_intercept
c) normalize
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