1. 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 and b

   Ans. The correct answer is d) Both a and b

2. 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

   Ans. The correct answer is d) **The value R^2 = 1, which corresponds to SSR = 0**

3. 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

   Ans. The correct answer is a) Y

4. 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

Degree: 1, $R^2 = 0.09$

Degree: 2, $R^2 = 0.77$

Degree: 3, $R^2 = 0.91$

Degree: 5, $R^2 = 1.0$
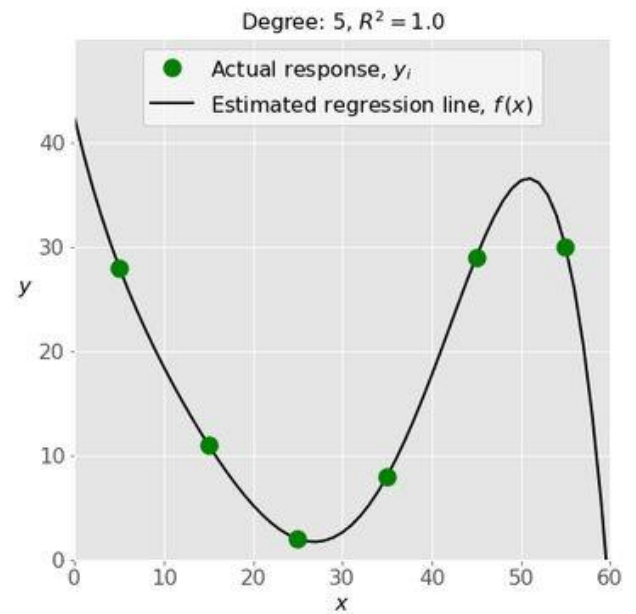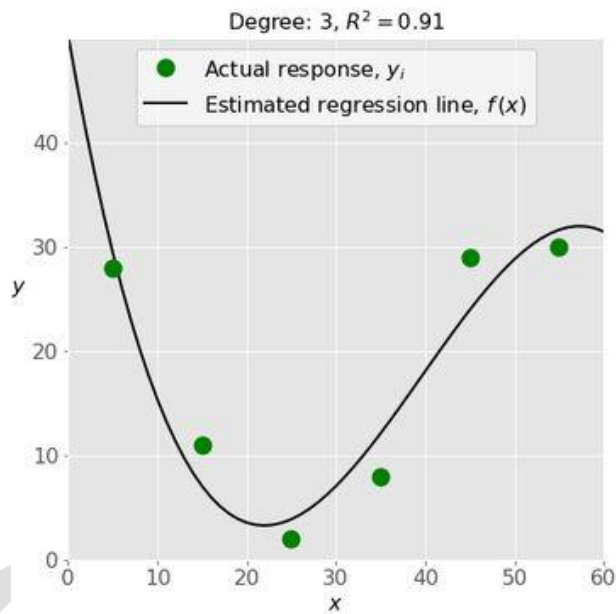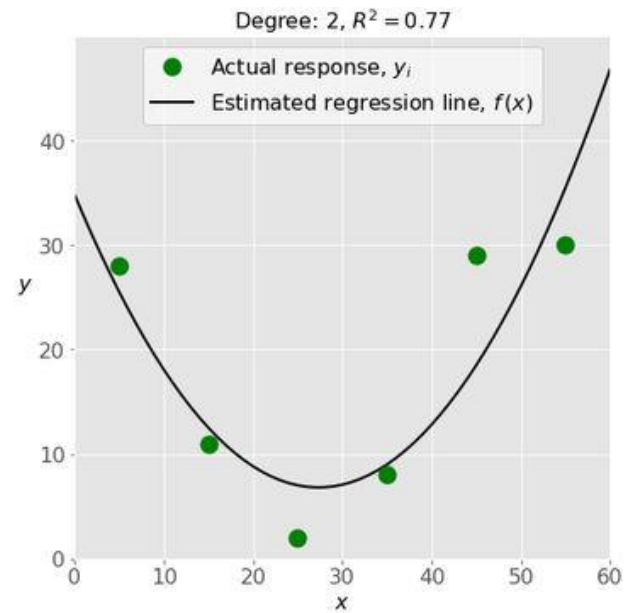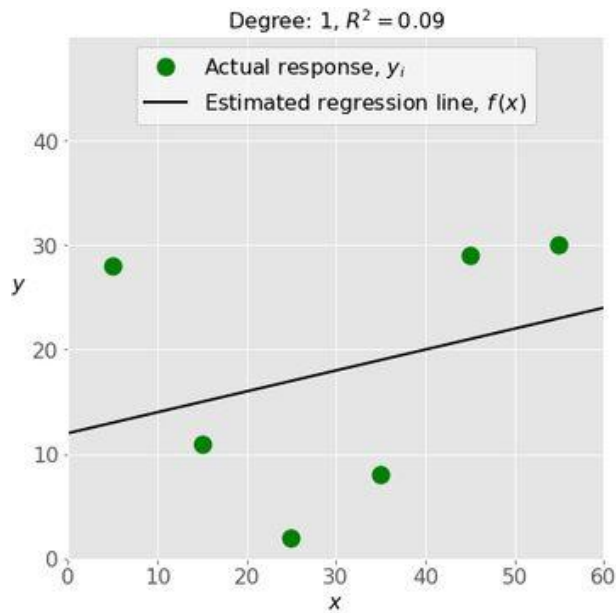
Ans. The correct answer is **d) The top-left plot** as the value of R^2 **is low and data points seem to be moving farther away from the line of best fit.**

5. **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

Ans. The correct answer is d) **d, b, e, a, c**
 d. Import the packages and classes that you need.
 b. Provide data to work with, and eventually do appropriate transformations.
 e. Create a regression model and fit it with existing data.
 a. Check the results of model fitting to know whether the model is satisfactory.
 c. Apply the model for predictions.

6. **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

Ans The optional parameters to LinearRegression in scikit-learn are:

   b) fit_intercept

   c) normalize

   d) copy_X

   e) n_jobs.

7. **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

   Ans. The correct answer is c) Polynomial Regression

8. **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.

Ans. The correct answer is c) You need more detailed results

9. **_____ 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

   Ans. The correct answer is **b) Numpy** as it provides mathematical functions, random number generators, linear algebra routines, Fourier transforms, and more. It provides a high-level syntax that makes it accessible and productive.

10. **_____ 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

    Ans. The correct answer is **b) Seaborn ,** it is a library based on Matplotlib which 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.