A PYTHON PROGRAM TO IMPLEMENT UNIVARIATE, BIVARIATE AND MULTIVARIATE REGRESION

Aim*:*

To implement a python program using univariate, bivariate and multivariate regression features for a given iris dataset.

Algorithm:

Step 1: Import necessary libraries:

- pandas for data manipulation, numpy for numerical operations, and matplotlib.pyplot for plotting.

Step 2: Read the dataset:

- Use the pandas `read_csv` function to read the dataset.
- Store the dataset in a variable (e.g., `data`).

Step 3: Prepare the data:

- Extract the independent variable(s) (X) and dependent variable (y) from the dataset.
- Reshape X and y to be 2D arrays if needed.

Step 4:Univariate Regression:

- For univariate regression, use only one independent variable.
- Fit a linear regression model to the data using numpy's polyfit function or sklearn's LinearRegression class.

- Make predictions using the model.

- Calculate the R-squared value to evaluate the model's performance.

Step 5: Bivariate Regression:

- For bivariate regression, use two independent variables.

- Fit a linear regression model to the data using numpy's `polyfit` function or sklearn's `LinearRegression` class.

- Make predictions using the model.

- Calculate the R-squared value to evaluate the model's performance.

Step 6: Multivariate Regression:

- For multivariate regression, use more than two independent variables.

- Fit a linear regression model to the data using sklearn's `LinearRegression` class.

- Make predictions using the model.

- Calculate the R-squared value to evaluate the model's performance.

Step 7: Plot the results:

- For univariate regression, plot the original data points (X, y) as a scatter plot and the regression line as a line plot.

- For bivariate regression, plot the original data points (X1, X2, y) as a 3D scatter plot and the regression plane.

- For multivariate regression, plot the predicted values against the actual values.

Step 8: Display the results:

- Print the coefficients (slope) and intercept for each regression model.

- Print the R-squared value for each regression model.

Step 9: Complete the program:

- Combine all the steps into a Python program.

- Run the program to perform univariate, bivariate, and multivariate regression on the dataset.

PROGRAM:

RESULT: -

Thus, the python program to implement univariate, bivariate and multivariate regression features for the given iris dataset is analyzed and the features are plotted using scatter plot.