LAB ASSIGNMENT-4

Title: Implement the non-parametric Locally Weighted Regression algorithm in order to fit data points. Select appropriate data set for your experiment and draw graphs

Objective: To fit data points by assigning different weights to each point based on its proximity to the query point.

Dataset: use a synthetic dataset with a sinusoidal pattern to showcase the capabilities of the Locally Weighted Regression algorithm. You can generate a dataset by using python code.

```
np.random.seed(0)
X = np.sort(5 * np.random.rand(80, 1), axis=0)
y = np.sin(X).ravel() + np.random.normal(0, 0.1, X.shape[0])
```

Tasks:

1) Generate a dataset.
2) Split each dataset into features (X) and target variable (y).
3) Implement the Locally Weighted Regression algorithm:
4) Experiment using multiple query points across the range of the dataset.
5) Create a plot with the original dataset points and the fitted curves for different query points and bandwidths.

Submission:
Prepare a PDF file that covers all the tasks mentioned above. Include code snippets, visualizations, and tables to support your analysis. Clearly explain the steps you took, the results you obtained, and your interpretation of the findings.