1. What are the different types of kernels used in SVM?

   The most commonly used kernels in SVM are:

   Linear Kernel

   Polynomial Kernel

   Radial Basis Function (RBF) Kernel

   Sigmoid Kernel[2]

2. What is the Ensemble Methods classification svc?

   Ensemble methods in classification combine multiple classifiers to improve the overall performance and robustness of the model. When applied to Support Vector Classification (SVC), ensemble methods can significantly enhance predictive accuracy and generalization. Here are some common ensemble methods used with SVC.

3. What is the role of the C parameter in SVM?

   The C parameter in Support Vector Machines (SVM) plays a crucial role in controlling the trade-off between achieving a low error on the training data and maintaining a large margin that separates the classes.

   Role of the C Parameter:

- High C Value: The model will prioritize minimizing the classification error on the training data. This means it will try to classify all training examples correctly, even if it results in a smaller margin. This can lead to over fitting, where the model performs well on training data but poorly on unseen data.
- Low C Value: The model will allow some misclassifications on the training data to achieve a larger margin. This can lead to better generalization on unseen data, as the model is less sensitive to noise and outliers.

4. What is the problem statement?

   This the Support Vector Classifier (SVC)

5. What is the overall performance design tree?

   Overall performance == 0.78

6. What is the correct performance of purchase?

$$\text{Recall} = TP / TP + FN \quad == 0.47$$

7. How SVC Works
1.   Linear SVC:

When the data is linearly separable, SVC finds a straight line (or hyper plane) that separates the classes.

The algorithm looks for the hyper plane that maximizes the margin between the classes.

2. Non-linear SVC:

Real-world data is often not linearly separable. In such cases, SVC uses kernel functions to transform the data into a higher-dimensional space where it becomes linearly separable.

Common kernel functions include:

Polynomial Kernel: Transforms the data into a higher-degree polynomial space.

Radial Basis Function (RBF) Kernel: Maps the data into an infinite-dimensional space using a Gaussian function.