Task 7: Support Vector Machines (SVM)

- **Objective: Use SVMs for linear and non-linear classification.**
- **Tools: Scikit-learn, NumPy, Matplotlib**

Hints/Mini Guide:

1. Load and prepare a dataset for binary classification.
2. Train an SVM with linear and RBF kernel.
3. Visualize decision boundary using 2D data.
4. Tune hyperparameters like C and gamma.
5. Use cross-validation to evaluate performance.

Dataset: You can use any dataset relevant to the task, e.g., Breast Cancer Dataset
link to download: click here to download dataset

What You'll Learn : Margin maximization, kernel trick, hyperparameter tuning.

Interview Questions:

1. What is a support vector?
2. What does the C parameter do?
3. What are kernels in SVM?
4. What is the difference between linear and RBF kernel?
5. What are the advantages of SVM?
6. Can SVMs be used for regression?
7. What happens when data is not linearly separable?
8. How is overfitting handled in SVM?

📤 **Submit Here:**
After completing the task, paste your GitHub repo link and submit it using the link below:

- 👉 [Submission Link]

📌 **Task Submission Guidelines**

- ⏰ **Time Window:**

You can complete the task anytime between 10:00 AM to 10:00 PM on the given day. Submission link closes at 10 :00 PM

- 🔍 **Self-Research Allowed:**

You are free to explore, Google, or refer to tutorials to understand concepts and complete the task effectively.

- 🛠️ **Debug Yourself:**

Try to resolve all errors by yourself. This helps you learn problem-solving and ensures you don't face the same issues in future tasks.

- 💸 **No Paid Tools:**

If the task involves any paid software/tools, do not purchase anything. Just learn the process or find free alternatives.

- 📁 **GitHub Submission:**

Create a new GitHub repository for each task.
Add everything you used for the task — code, datasets, screenshots (if any), and a **short README.md** explaining what you did.

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- 👉 [Submission Link]