✅ Task 16: Hyperparameter Tuning using GridSearchCV

Dataset:
- Primary: Breast Cancer Dataset (sklearn)
- Alternative: Titanic Dataset

Tools:
- Python
- Scikit-learn (GridSearchCV)
- Pandas
- Jupyter Notebook / Google Colab

Hints / Mini Guide:

1. Load dataset and apply basic preprocessing.
2. Split data into training and testing sets.
3. Select a model such as SVM or Random Forest.
4. Define parameter grid for tuning.
5. Apply GridSearchCV with cross-validation.
6. Extract best parameters and trained model.
7. Compare tuned model performance with default model.

Deliverables:

- Notebook with GridSearchCV
- Best parameters output
- Performance comparison table

Final Outcome:
Intern learns model optimization and performance improvement techniques.

Interview Questions Related To Above Task:

- What are hyperparameters?
- Why GridSearchCV is used?
- What is cross-validation?
- Why tuning on test data is wrong?
- GridSearch vs RandomSearch?

📌 **Task Submission Guidelines**

- ⏰ **Time Window:**

Youcan 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:**

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

- 🛠️ **Debug Yourself:**

Tryto 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:**

Ifthe 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.

📤 **Submit Here:**

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

- 👉 [Submission Link]