**Task 14**

Machine Learning

Upload .py or Ipynb extension file on GitHub public repo “100DaysofBytewise" and share the link in the submission form by 25 July 2024.

##### **Dataset : Titanic Dataset**

1. **Evaluating Logistic Regression with Cross-Validation**
   * **Exercise:** Implement logistic regression and evaluate the model using k-fold cross-validation.
   * Compare the cross-validation scores with a single train-test split evaluation.
2. **Analyzing Overfitting and Underfitting in Decision Trees**
   * **Exercise:** Train a decision tree classifier with varying depths to analyze overfitting and underfitting.
   * Plot training and validation accuracies to visualize the effects.
3. **Calculating Precision, Recall, and F1-Score for Logistic Regression**
   * **Exercise:** Implement logistic regression and calculate precision, recall, and F1-score for the model.
   * **Tip: Discuss how these metrics provide insights into model performance in your week article.**
4. **ROC Curve Analysis for Decision Trees**
   * **Exercise:** Implement a decision tree classifier and plot the ROC curve.
   * Compute the AUC (Area Under the Curve) and interpret the results.
5. **Comparing Model Performance with and without Cross-Validation**
   * **Exercise:** Train logistic regression and decision tree models with and without cross-validation.
   * Compare their performance metrics, including accuracy, precision, and recall.