Assignment S Name - Gauxang Patil PRN - 1032221535 T.Y B- Tech (SF Title > W.A.P to implement sum classifier comport with tree algorithm. Asm > w.A. P to implement sum classifier, lompure with decision tree algorithm objective > To study the SUM classifier and decision tree algo Theory ->

1) Overvices of (SUM) and Decision Trees as classifies

algorithm. (Sum) Support Vector Machines

(soal-find the aptimal hyperplane to Separate classes

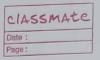
strengths - Handles High dimensional data expective with

non-linear kernels

weakness - Slow on large datasets, Requires lareful

tuning Best for lomplex boundaries with small to Medicom dataset strength - Edsy to interpret works with both Categorical and numerical closes. Dealeness- Prone to overfitting, Sensitive to data change

		CIASSMAte Date: Page:
	2)	what Ps Confusion matrix Exculvation metrocas wed to Company the performance of the classifiers (rig accuracy, hiscure, recall);
	any -	A table that Summarizes the performance of a classifies. model by Comparing predicted and actual Clabels.
opt		Preclected Predected Positive Megative. Actual Positive True Positive (IP False Wegative (IN) Actual Negative False Positive (IP) True Negative (IN)
A		Accusacy > Meanures overall Correctness, but may be mistereding
•		Accuracy - (TP+TN) / (Total Samples) Precision > Proution of Relevant Instances among the precision of positive Precision = TP/(TP+FP) Lecale > Praction of actual positive correctly identified
<u>Au</u>		Recoll = TP(TP+FIV) FI-Score > Hormone mean of Precision and Record, Useful for imbulanced Hataset. PI-Score = RY (Inecision x Recoll) / (Precision & Record)
	3	Explain The Dataset Prolain how the dataset was divided into training and testing sets. Mention the brain-test split ratio
		The First doctaret is a closer dutuset used for closesification tasks. It contains 150 samples of ions flowers with fun.



	features namely Speallength, Spepal width, Petal length and Petal width back Sample. butong to one of theree Clusses. For Schoon, Irrs News 1010r, Fris Virginia.
	Tourn-test could to to evaluate the model, the dataset is typically alvided into baining and festing sets. The bain - test spirt ratio is 80%. (Training) and 20%. (Testing)
) i)	FAQUE -> State the objectives of the Cab experiment Implement SVM and Decision Tree classifiers. Tompare on their performance using metales Wiese accounting.
611)	Specify the parameters and hyperparameters ared for both
	the sum and pecision tree classificar. VM classifica kennel: Depines the types of hyperplane for classification []inear.
	Random state: 42 (Entures Reproducibility). Other option: ((regularization), gamma (RBP kennel (ocprision)
,	Max Depth: None (Allows the tore to grow faily). Critizea: Sinit (wed to measure the quality of a path) Pundom State: 42 1 For reproductility).

	CIASSMATE Data: Paga:
(13)	Explain the importance or comparing the two algorithms
	Performance. Assessment - Identify which algorithm yields better according predistant record and proscore for the dested
	11) Model selection - Help choose the Bright also based -on Interpretability, board on time and scalability
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```
svm.py
svm.py > ...
      import numpy as np
       from sklearn import datasets
       from sklearn.model_selection import train_test_split
       from sklearn.svm import SVC
       from sklearn.tree import DecisionTreeClassifier
       from sklearn.metrics import accuracy_score
      # Load a sample dataset (Iris dataset in this case)
      iris = datasets.load_iris()
      X = iris.data # Features
      y = iris.target # Labels
      X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=42)
       svm_classifier = SVC(kernel='linear') # Linear kernel SVM
       svm_classifier.fit(X_train, y_train)
      dt_classifier = DecisionTreeClassifier() # Default parameters for Decision Tree
      dt_classifier.fit(X_train, y_train)
      # Make predictions with both classifiers
       svm_predictions = svm_classifier.predict(X_test)
      dt_predictions = dt_classifier.predict(X_test)
       svm_accuracy = accuracy_score(y_test, svm_predictions)
      dt_accuracy = accuracy_score(y_test, dt_predictions)
      print("SVM Classifier Accuracy:", svm_accuracy)
       print("Decision Tree Classifier Accuracy:", dt_accuracy)
```

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SVM Classifier Accuracy: 1.0
Decision Tree Classifier Accuracy: 1.0

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DEBUG CONSOLE

PROBLEMS