Name: Deep Salunkhe RAND: 2110-A001C. SAD : ML Assignment 5 Oil You are tasked with developing a predictive model for patient outcomes in a healthcase setting. Explain the impostance of K-fold cross-validation in evaluating the performance at your model. Demonstrate how you would implemed k-told cross validation and interpret the results Importance of k-fold cross-validation K-fold cross-volidation is a crucial technique for evaluating the performance of an predictive model du to several. - Preventing Overfitting: By splitting the data into multiple. evaluated on data it hasn't seen. It provides more reliable estimate of the model's performance on unseen data
- Hyperpassametr tunning: It can be used to optimize model hyperparemeter - Robustrusi. Implementation of k-Fold cooss volidation - Data perparation: Collect and perposes patient data.

including selevent features and terrycl.

vanuable

- Handle missing values, arthress and feature raly as

ned



-splitting Data: Bandonsy divide the data into k
equal sized folds

- Cooss - ralidation - loop:

for each fold:

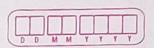
- Use K-1 folds as the tourning set to build the model
- Use the remaining fold as the test set to evaluate the model's pertormance.
 - Colculate performana matrix

- pertormance Evaluation

Colculate the average performance metrix accoss all folds to obtain a seleable estimate of the, model's performance.



Q2	I compare the performance of a basic decision tree model.
	with an x&Boost model and know it improves
	over a single decision tree. Evaluate the model
our.	using appropriate performance metrics
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	ost churts
>	Decision tree and xGBoost are both popular machine.
	learning algorithms for classification tasks like
	employee pardiction. However, XGBast is generally
	considered, most powerful due to its ensemble-best
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	between partie as when assured
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	TO D is a second of single decision throught.
	XGBOOST improves upon a single decision treeby.
	- Ensemble learning: Combining multiple de cirión tore. fo reduce variance and. Improve accuracy.
	- Ensemble learning . Comprise and .
	To leader variables and
	Improve accuracy.
	- Goadrent Boosting: Sequentially building trees with each tree correcting the errors of
	tace correcting the enois of
	previous trues.
	- Regularization: preventing overfitting through technique like 11 4 12 regularization.
	tehnique like 1 4 12 regularization.
	- Handling musing value. Britterin mechanism for handling muy uto



	Perstormance Evaluation netrics
	1980 squal A Good book leboon troud ax as due
	ever a single decision take Francote the model
	Arrasay: proportion at correctly predicted attrition cases
	Precision: proportion of predicted attrition cases that one
	actually town
· · · ·	Recall : propostion of actual attrition cass that ox
9	ancety predicted,
	FI-score: Harmony mean of paccision and regall.
lood	AUCIPOZ: Area under the receiver operating characterist.
	curve, meaning the model's abilty to dutiquet
	bothern positive and nogative classes.
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