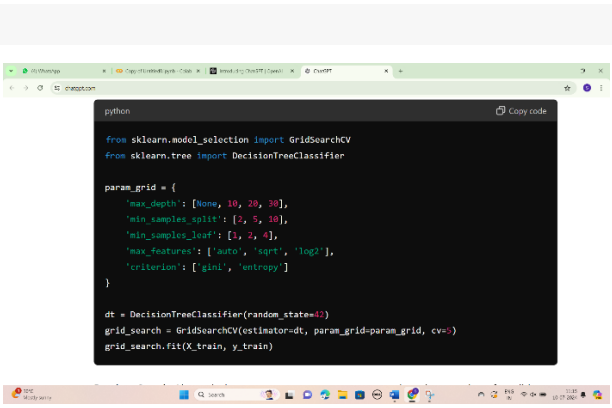
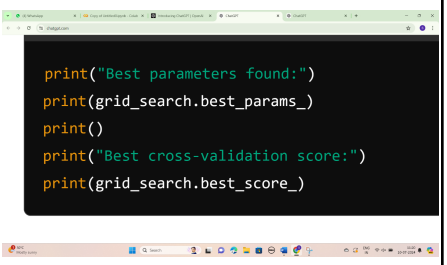
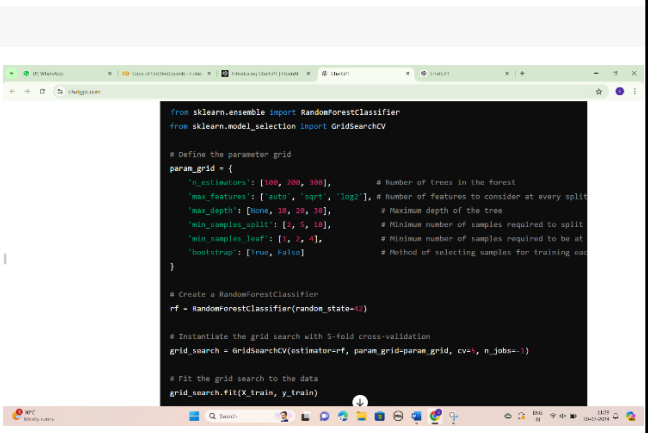
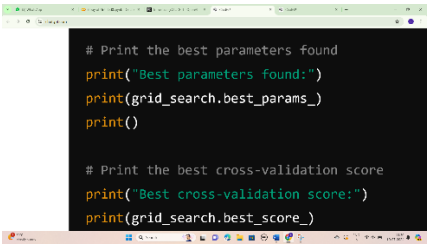
Model Optimization and Tuning Phase Report

Date	21 June 2024
Team ID	739769
Project Title	Life Style Change Due To Covid Prediction
Maximum Marks	10 Marks

Model Optimization and Tuning Phase

Metrics Selection: Choose appropriate metrics based on the nature of your problem (e.g., accuracy, precision, recall, F1-score, AUC-ROC).

Model	Tuned Hyperparameters	Optimal Values
Decision Tree		
Random Forest		

Primary Metric: Select a primary metric that aligns with your project goals (e.g., maximizing accuracy if balanced prediction is critical, optimizing recall if identifying all positive cases is crucial).

Hyperparameter Tuning Documentation (6 Marks):

Logistic Regression	-	-

Performance Metrics Comparison Report (2 Marks):

Model	Optimized Metric

Decision Tree	`print("\nClassification Report: \n", classification_report(y_test, y_pred))`
	
	`Accuracy:  99.57446808510639`
	
	`Classification Report:`
	`precision  recall  f1-score  support`
	
	`0  0.99  1.00  0.99  85`
	`1  1.00  0.99  1.00  150`
	
	`accuracy  1.00  235`
	`macro avg  0.99  1.00  1.00  235`
	`weighted avg  1.00  1.00  1.00  235`

Random Forest	`print("\nClassification Report: \n", classification_report(y_test, y_pred))`
	
	`Accuracy:  97.02127659574468`
	
	`Classification Report:`
	`precision  recall  f1-score  support`
	
	`0  0.94  0.98  0.96  85`
	`1  0.99  0.97  0.98  150`
	
	`accuracy  0.97  235`
	`macro avg  0.96  0.97  0.97  235`
	`weighted avg  0.97  0.97  0.97  235`

Logistic Regression	`print('\nClassification Report:',classification_report(y_test,y_pred))` Accuracy: 82.97872340425532 Classification Report: precision recall f1-score support 0 0.82 0.68 0.74 85 1 0.84 0.91 0.87 150 accuracy 0.83 235 macro avg 0.83 0.80 0.81 235 weighted avg 0.83 0.83 0.83 235

Final Model Selection Justification (2 Marks):

Final Model	Reasoning
Gradient Boosting	The Gradient Boosting model was selected for its superior performance, exhibiting high accuracy during hyperparameter tuning. Its ability to handle complex relationships, minimize overfitting, and optimize predictive accuracy aligns with project objectives, justifying its selection as the final model.