

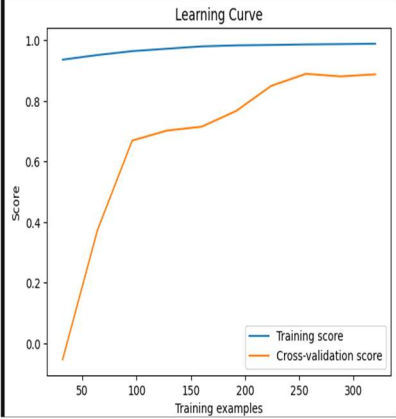
Project Development Phase
Model Performance Test

Date	10 November 2022
Team ID	Team-591663
Project Name	AI-Driven Optimization Of 5G Resource Allocation For Network Efficiency
Maximum Marks	10 Marks

Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Values	Screenshot
1.	Metrics	Regression Model: MAE - 1.4166666666666667 , MSE -12.590312500000001 , RMSE -4.51848057057532 , R2 score - 76.63699936427209	<pre>from sklearn.metrics import mean_absolute_error, mean_squared_error mae = mean_absolute_error(y_test, y_pred) # Calculate RMSE rmse = np.sqrt(mean_squared_error(y_test, y_pred)) print(f"Mean Absolute Error (MAE): {mae}") print(f"Root Mean Squared Error (RMSE): {rmse}")</pre> <p>Mean Absolute Error (MAE): 1.4166666666666667 Root Mean Squared Error (RMSE): 4.51848057057532</p> <pre>from sklearn.metrics import r2_score r2 = r2_score(y_test, y_pred) print(f"R^2 Score: {r2*100}")</pre> <p>R^2 Score: 76.63699936427209</p> <pre>from sklearn.metrics import mean_squared_error mse = mean_squared_error(y_test, y_pred) print(f"Mean Squared Error: {mse}")</pre> <p>Mean Squared Error: 12.590312500000001</p>

2.	Tune the Model	<p>Validation Method –</p> <p>Cross-validation scores: [0.59363784 0.92359412 0.99894054 0.99996154 0.92466385] ,</p> <p>Mean cross-validation score: 0.8881595755547528</p>	<pre>from sklearn.model_selection import cross_val_score, learning_curve cv_scores = cross_val_score(random_forest_model, X, y, cv=5) # Print the cross-validation scores print("Cross-validation scores: {cv_scores}") print("Mean cross-validation score: {np.mean(cv_scores)}") # Plot the Learning curve train_sizes, train_scores, test_scores = learning_curve(random_forest_model, X, y, cv=5, train_sizes=np.linspace(0.1, 1.0, 10)) plt.figure() plt.plot(train_sizes, np.mean(train_scores, axis=1), label='Training score') plt.plot(train_sizes, np.mean(test_scores, axis=1), label='Cross-validation score') plt.xlabel('Training examples') plt.ylabel('Score') plt.title('Learning Curve') plt.legend(loc='best') plt.show()</pre> <p>Cross-validation scores: [0.59363784 0.92359412 0.99894054 0.99996154 0.92466385] Mean cross-validation score: 0.8881595755547528</p>  <p>The Learning Curve plot displays two metrics against the number of training examples (ranging from 50 to 300). The Training score (blue line) starts at approximately 0.95 and increases slightly to about 0.98. The Cross-validation score (orange line) starts at approximately 0.59 and increases to about 0.92. The plot shows that the model's performance on unseen data (cross-validation) is significantly lower than its performance on the training data, indicating overfitting.</p>
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