

Random Forest

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Problem Statement

The objective of this analysis is to build a machine learning model using Random Forest Classification to predict whether a user will purchase a product based on their demographic and behavioral attributes. The goal is to evaluate the model's performance in terms of accuracy, precision, recall, and F1-score to ensure reliable and balanced classification outcomes.

Confusion Matrix

To evaluate the model's classification performance, a confusion matrix was generated. It provides a detailed breakdown of actual versus predicted values, helping to identify correct predictions and misclassifications for both classes (Purchased and Not Purchased).

	Purchased	Not Purchased
Purchased	78	7
Not Purchased	6	43

Evaluation Metrics

Accuracy:

Q: What is the percentage of correct classification of both (Purchased & Not Purchased) to the total input of the test set?

A: 0.90%

Recall:

Q: What is the percentage of correct classification of (Purchased) to the total input of (Purchased) in the test set?

A: 0.92%

Q: What is the percentage of correct classification of (Not Purchased) to the total input of (Not Purchased) in the test set?

A: 0.88%

Precision:

Q: What is the percentage of correct classification of (Purchased) to the total predicted as (Purchased)?

A: 0.93%

Q: What is the percentage of correct classification of (Not Purchased) to the total predicted as (Not Purchased)?

A: 0.86%

F1-Score:

Q: What is the overall performance of Purchased class?

A: 0.92%

Q: What is the overall performance of Not Purchased class? 0.87

A: 0.87%

Averaging Metrics Section:

Macro Average (unweighted mean)

Q: What is the average performance of Precision (across both classes)?

A: 0.89%

Q: What is the average performance of Recall (across both classes)?

A: 0.90%

Q: What is the average performance of F1-Measure (across both classes)?

A: 0.90%

Weighted Average (support-based)

Q: What is the weighted average Precision of the model?

A: 0.90%

Q: What is the weighted average Recall of the model?

A: 0.90%

Q: What is the weighted average F1-Measure of the model?

A: 0.90%