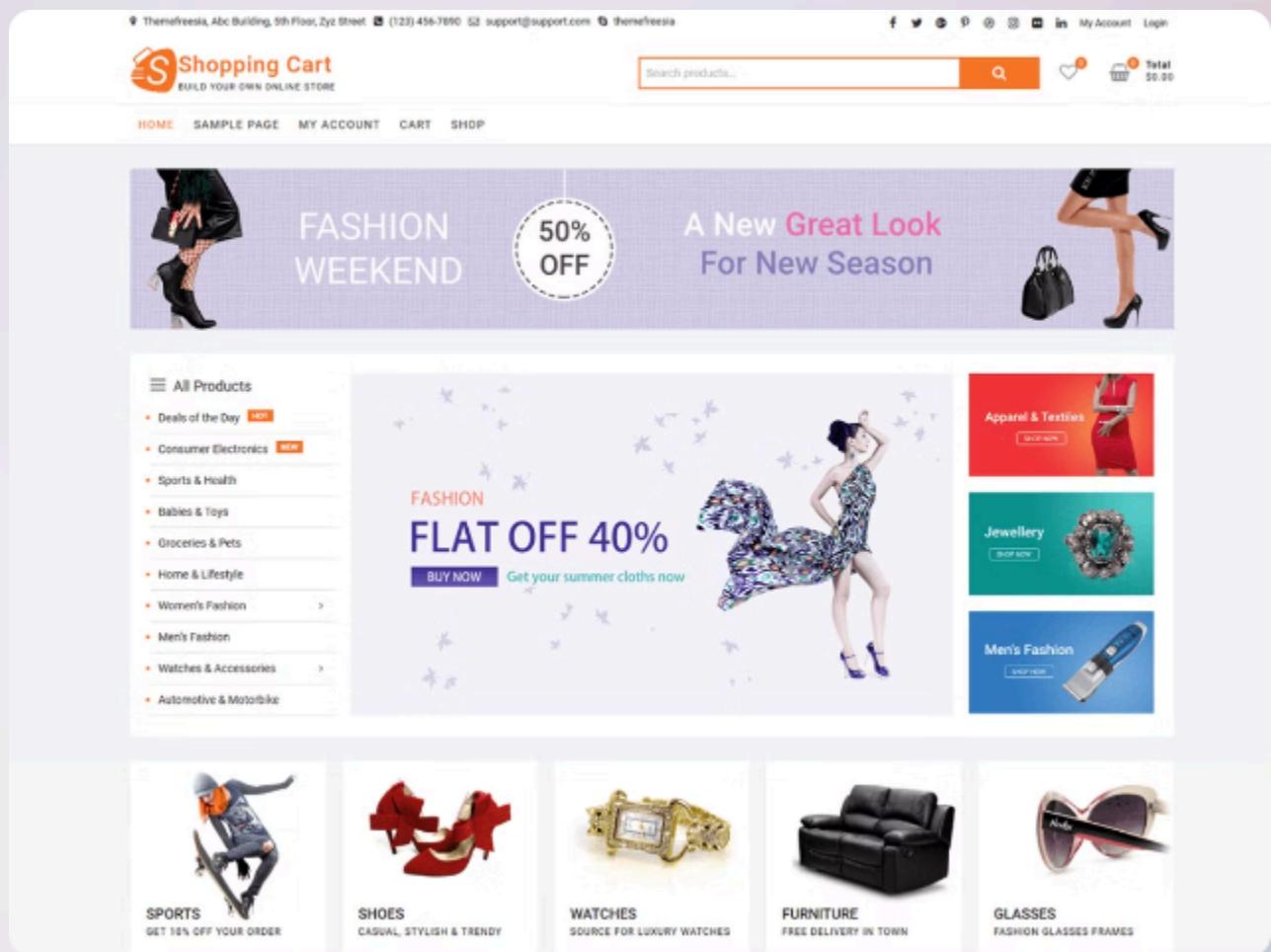


# Predicting E-commerce Purchases

This presentation explores a machine learning model designed to predict whether a customer visiting an e-commerce website will make a purchase. The Extra Tree Classifier model achieved a 94% accuracy rate.

Online-Prediction.ipynb





# Project Objective

This project aims to empower e-commerce businesses with a valuable tool for optimizing marketing efforts and enhancing customer engagement.

1

## Customer Behavior

Gain a deeper understanding of customer behavior on the website.

2

## Targeted Marketing

Utilize insights to tailor marketing campaigns for specific customer segments.

3

## Increased Conversion Rates

Improve the likelihood of converting website visitors into paying customers.

4

## Revenue Optimization

Drive increased revenue by maximizing sales opportunities.



# Data Collection and Preparation

The project involved collecting and preparing data from a real-world e-commerce platform, encompassing customer interactions, product information, and purchase history.

## Data Collection

Gathering data from various sources, including website logs, customer databases, and transaction records.

1

2

3

## Feature Engineering

Transforming raw data into meaningful features, including session duration, number of page views, product categories, and purchase history.

## Data Cleaning

Removing inconsistencies, errors, and missing values, ensuring data accuracy and integrity.

# Model Selection and Training

The Extra Tree Classifier algorithm was chosen for its ability to handle complex datasets and generate accurate predictions.

## Extra Tree Classifier

A robust ensemble learning algorithm known for its speed and effectiveness in high-dimensional datasets.

## Training Data

The model was trained on a large dataset of historical e-commerce interactions, allowing it to learn patterns and relationships.

[Sample Dataset](#)

## Model Evaluation

The model's performance was evaluated through rigorous testing and validation processes.

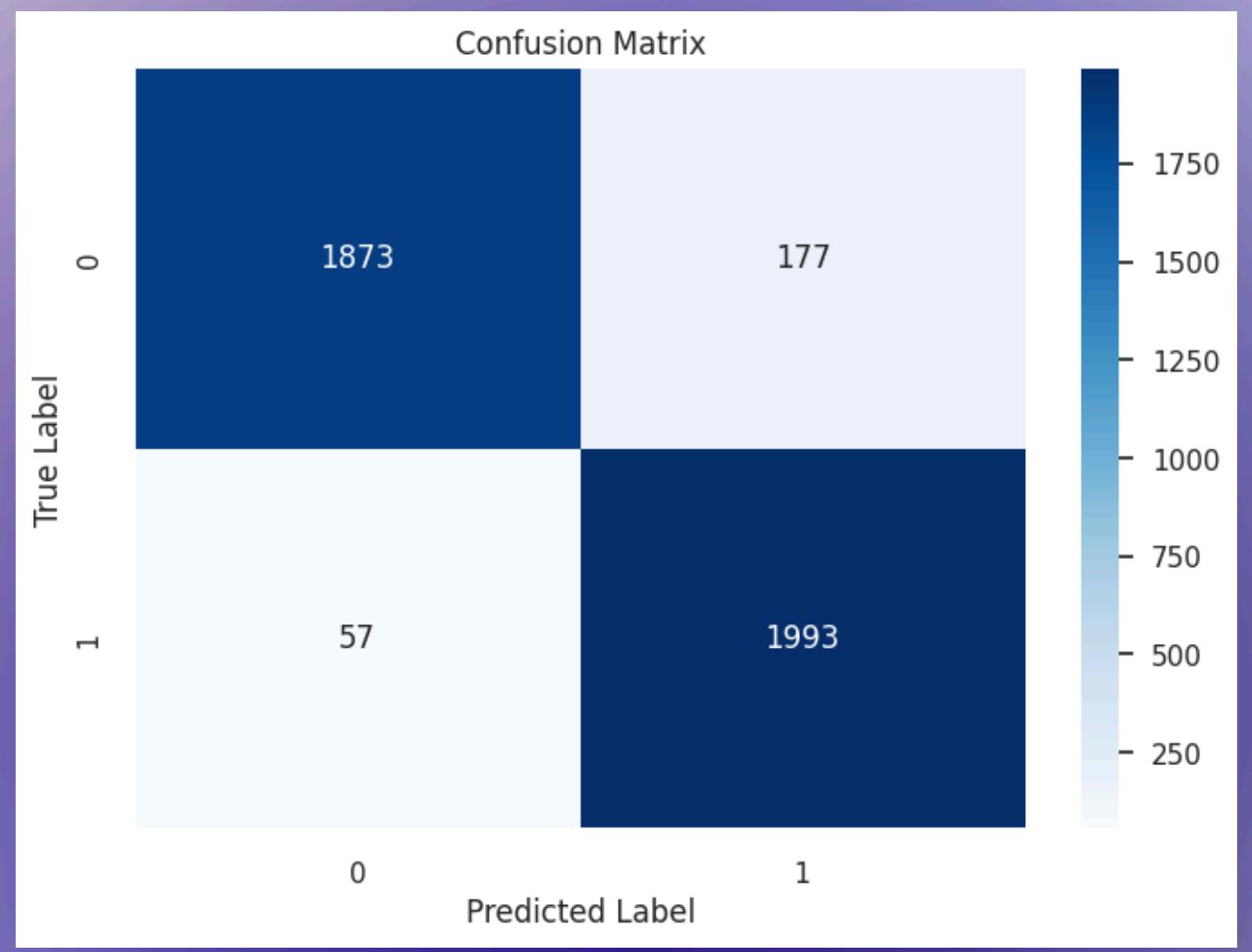
# Model Performance Evaluation

The model demonstrated impressive accuracy, correctly predicting 94% of purchase outcomes, surpassing other tested algorithms.

Metric	Value
Accuracy	0.94
Precision	0.97
Recall	0.91
F1-Score	0.94

# Confusion Matrix

The confusion matrix provides a comprehensive view of the model's performance, illustrating the number of true positives, true negatives, false positives, and false negatives.



## True Positives

The model correctly predicted a purchase would occur.



## False Positives

The model incorrectly predicted a purchase would occur.



## True Negatives

The model correctly predicted a purchase would not occur.



## False Negatives

# Sample Test Case: User Input & Output

Explore a demonstration of input data provided by users and the corresponding output generated by the system. This sample test case showcases the accuracy and effectiveness of the prediction model in a user-friendly manner.

```
▶ visitor_type_mapping = {  
    'New_Visitor': 1,  
    'Other': 0,  
    'Returning_Visitor': 0  
}  
  
# visitor_type_mapping = {  
#     'New_Visitor': 0,  
#     'Other': 0,  
#     'Returning_Visitor': 1  
# }  
  
user_df['VisitorType_New_Visitor'] = user_df['VisitorType'].map(visitor_type_mapping)  
user_df['VisitorType_Other'] = user_df['VisitorType'].map(visitor_type_mapping)  
user_df['VisitorType_Returning_Visitor'] = user_df['VisitorType'].map(visitor_type_mapping)  
  
# Drop the original VisitorType column  
user_df.drop('VisitorType', axis=1, inplace=True)  
  
# Make a prediction for the user input  
prediction = et.predict(user_df)  
print(prediction)
```

```
▶ user_input = {'Administrative_Duration': 50,  
               'Informational_Duration': 100,  
               'ProductRelated_Duration': 200,  
               'BounceRates': 0.05,  
               'ExitRates': 0.1,  
               'PageValues': 20,  
               'SpecialDay': 0,  
               'Month': 7,  
               'OperatingSystems': 0,  
               'Browser': 0,  
               'Region': 0,  
               'TrafficType': 1,  
               'VisitorType': 'New_Visitor',  
               'Weekend': 1}
```

# Practical Implications

The model's insights enable e-commerce businesses to make data-driven decisions regarding marketing strategies and customer engagement.



- 1
- 2
- 3

## Targeted Advertising

Identify high-potential customers and deliver targeted advertising campaigns.

## Personalized Recommendations

Offer personalized product recommendations based on customer preferences and purchase history.

## Improved Website Experience

Optimize website design and content to enhance customer experience and encourage purchases.