COLLEGE CODE: 3126

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DEPARTMENT: B. E. COMPUTER SCIENCE

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LINK: https://github.com/yuvasri-M/EBPL.git

Completed the project named as

PERSONALISED MARKETING AND CUSTOMER EXPERIENCE

SUBMITTED BY,

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PHASE 5: PROJECT DEMONSTRATION & DOCUMENTATION

TITLE: AI-DRIVEN PERSONALIZED MARKETING AND CUSTOMER EXPERIENCE PLATFORM

Abstract:

The Personalized Marketing and Customer Experience project harnesses artificial intelligence, machine learning, and behavioural analytics to enhance customer interactions and marketing effectiveness. It focuses on delivering individualized experiences using data collected from customer behaviour, preferences, and engagement history. The system incorporates recommendation engines, dynamic content generation, real-time feedback loops, and omnichannel integration to elevate customer satisfaction and business ROI.

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1. **Project Demonstration**

Overview:

The demonstration focuses on how the platform delivers tailored marketing content, analyses customer journeys, and adapts in real time to user behaviour.

Demonstration Details:

- Customer Journey Walkthrough: Simulated user interactions across email, web, and mobile touchpoints to show dynamic content delivery.
- Recommendation Engine: Live showcase of personalized product/service suggestions based on user profiles and engagement patterns.
- Behavioural Targeting: Real-time analysis of user interactions to tailor content, emails, and product suggestions.
- Dashboard Overview: Admin interface displaying analytics like CTR, conversion rates, bounce rates, and session durations.
- Security & GDPR Compliance: Explanation of data anonymization, consent management, and privacy protocols.

Outcome:

Stakeholders will observe how personalized marketing improves customer engagement, drives conversions, and supports ethical data usage.

2. **Project Documentation**

Overview:

A detailed documentation set is provided covering all technical, functional, and operational aspects.

Documentation Sections:

- System Architecture: Flowcharts and diagrams of data collection, recommendation logic, and delivery layers.
- Algorithm Documentation: ML model types used (e.g., collaborative filtering, clustering), training datasets, and model evaluation metrics.
- User Guide: Instructions for customers using the platform, including opt-in preferences and feedback tools.
- Admin Guide: Platform configuration, campaign creation, audience segmentation, and system monitoring.
- API Reference: For integrations with CRMs, CMS platforms, and third-party analytics.
- Testing Reports: Test cases, performance benchmarks, and A/B testing results for personalization modules.

Outcome:

The documentation enables smooth future maintenance, onboarding of new developers, and easy scaling.

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3. ***Feedback and Final Adjustments***

Overview:

Based on beta user and stakeholder input, iterative enhancements will be applied.

Steps:

- Survey Distribution: Collect insights from marketers, developers, and test users.
- Data Analysis: Identify drop-off points, engagement lags, and personalization mismatches.
- System Tuning: Improve model accuracy, UI/UX refinements, and performance tuning.
- Revalidation: Conduct regression tests post-adjustments.

Outcome:

System is polished based on real feedback to maximize usability and effectiveness.

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4. ***Final Project Report Submission***

Overview:

- Summarizes the overall journey, technological stack, key learnings, and project impact.
- Report Sections:
- Executive Summary: Overview of objectives, approach, and results.
- Phase Summaries: Breakdown of requirement gathering, development, training, and deployment.
- Marketing Metrics: Insights into improvements in engagement, retention, and ROI.
- Challenges & Solutions: e.g., dealing with cold-start problems in recommendation systems or privacy concerns.

Outcomes:

Increased personalization accuracy, reduced churn, and enhanced campaign success rates.

Outcome:

A formal project record suitable for handover, academic evaluation, or client presentation.

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5. ***Project Handover and Future Works***

Overview:

Preparation for scalability and extensibility.

Handover Details:

- Deployment Documentation: Steps for production rollout.
- Future Scope:
- Integrate with voice assistants.
- Introduce real-time chat support powered by GPT.
- Advanced sentiment analysis.
- Cross-platform predictive analytics.

Outcome:

The platform is ready for expansion with roadmap clarity for ongoing improvements.

Additional Material:

- Screenshots of UI and admin dashboard
- Snapshots of ML model training and output
- Sample personalized email or web content
- Source code excerpts and project folder tree

CODE:

```
import pandas as pd
from sklearn.cluster import KMeans
import matplotlib.pyplot as plt

# Sample dataset: Replace with your actual data
data = {
    'CustomerID': [1, 2, 3, 4, 5, 6],
    'Age': [25, 45, 35, 23, 52, 40],
    'AnnualIncome': [40000, 85000, 60000, 32000, 120000,
70000],
    'SpendingScore': [60, 40, 90, 75, 30, 50]
}

df = pd.DataFrame(data)

# Feature selection
features = df[['Age', 'AnnualIncome', 'SpendingScore']]

# Apply KMeans clustering
kmeans = KMeans(n_clusters=3, random_state=0)
df['Segment'] = kmeans.fit_predict(features)

# Define marketing messages per segment
segment_messages = {
    0: "Offer premium products with loyalty benefits.",
    1: "Provide budget-friendly promotions and savings tips.",
    2: "Recommend personalized experiences based on
behavior."
}

# Generate personalized messages
df['MarketingMessage'] = df['Segment'].apply(lambda x:
segment_messages[x])

# Output personalized results
print(df[['CustomerID', 'Segment', 'MarketingMessage']])

# Optional: Plotting the customer segments
plt.scatter(df['AnnualIncome'], df['SpendingScore'],
c=df['Segment'], cmap='viridis')
plt.xlabel('Annual Income')
plt.ylabel('Spending Score')
plt.title('Customer Segmentation for Personalized
Marketing')
plt.show()
```