

✓ Personalized Travel Recommendation Alternative destinations Travel deals or upgrades

```
import pandas as pd
import streamlit as st

df = pd.read_csv('travel_data.csv')

destination_alternatives = {
    'Paris': ['Rome', 'Barcelona', 'Amsterdam'],
    'London': ['Dublin', 'Berlin', 'Edinburgh'],
    'Rome': ['Athens', 'Florence', 'Lisbon'],
    'Dubai': ['AbuDhabi', 'Doha', 'Muscat'],
    'Chicago': ['Houston', 'Dallas', 'Atlanta'],
    'New York': ['Boston', 'Philadelphia', 'Washington DC'],
    'AbuDhabi': ['Dubai', 'Doha', 'Manama'],
    'Islamabad': ['Istanbul', 'Tashkent', 'Baku'],
    'Los Angeles': ['San Francisco', 'San Diego', 'Las Vegas'],
    'Mumbai': ['Delhi', 'Hyderabad', 'Bangalore'],
    'Houston': ['Chicago', 'Dallas', 'Phoenix'],
    'Sydney': ['Melbourne', 'Brisbane', 'Auckland']
}

def recommend_alt_dest(row):
    if row['booking_made'] == 1:
        return []
    dest = row['search_destination']
    if row['search_origin'] == row['search_destination']:
        return ["Trending destinations from origin"]
    return destination_alternatives.get(dest, []):2]

def recommend_deals(row):
    recs = []
    if row['clicked_offer'] == 1 and row['booking_made'] == 0:
        recs.append("Time-limited discount")
    if row['travel_dates_flexibility'] == 1:
        recs.append("Flexible date deals")
    if row['device_type'].lower() == 'mobile':
        recs.append("Mobile-only quick deal")
    if row['session_duration'] > 8 and row['pages_visited'] > 5 and row['booking_made'] == 0:
        recs.append("Follow-up email with bundles")
    return recs

df['Alternative Destinations'] = df.apply(recommend_alt_dest, axis=1)
df['Travel Deals/Upgrades'] = df.apply(recommend_deals, axis=1)

st.title("🔍 Personalized Travel Recommendation Engine")

user_id = st.selectbox("Select User ID", df['user_id'].unique())

user_data = df[df['user_id'] == user_id]

st.write("### 🔍 Search Details")
st.dataframe(user_data[['search_origin', 'search_destination', 'device_type']])

st.write("### 🌍 Alternative Destinations")
st.write(user_data['Alternative Destinations'].values[0])

st.write("### 🛡️ Deal or Upgrade Recommendations")
st.write(user_data['Travel Deals/Upgrades'].values[0])
```