P4 - Database Schema Implementation

Title : Sustainable Tourism Management System

Submitted By: Group 11

DDL Script for Tables

```sql
CREATE DATABASE STMS;
GO

USE STMS

-- 1. Destination Table
CREATE TABLE Destination (
    DestinationID INT PRIMARY KEY IDENTITY,
    DestinationName NVARCHAR(100) NOT NULL,
    Country NVARCHAR(50),
    Region NVARCHAR(50),
    Climate NVARCHAR(50),
    PeakSeason NVARCHAR(50),
    OffSeason NVARCHAR(50),
    AverageAnnualVisitors INT,
    SustainabilityScore DECIMAL(5, 2),
    CarryingCapacity INT,
    CONSTRAINT CHK_SustainabilityScore CHECK (SustainabilityScore >= 0 AND
SustainabilityScore <= 100)
);

-- 2. Accommodation Table
CREATE TABLE Accommodation (
    AccommodationID INT PRIMARY KEY IDENTITY,
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
    AccommodationName NVARCHAR(100) NOT NULL,
    AccType NVARCHAR(50),
    Capacity INT,
    SustainabilityRating DECIMAL(5, 2),
    EnergyEfficiencyScore DECIMAL(5, 2),
    WaterConservationScore DECIMAL(5, 2),
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    WasteManagementScore DECIMAL(5, 2),
    LocalEmploymentPercentage DECIMAL(5, 2),
    CONSTRAINT CHK_Scores CHECK (EnergyEfficiencyScore >= 0 AND EnergyEfficiencyScore
<= 100
                                 AND WaterConservationScore >= 0 AND
WaterConservationScore <= 100
                                 AND WasteManagementScore >= 0 AND WasteManagementScore
<= 100)
);


-- 3. Tourist Table
CREATE TABLE Tourist (
    TouristID INT PRIMARY KEY IDENTITY,
    FirstName NVARCHAR(50),
    LastName NVARCHAR(50),
    Nationality NVARCHAR(50),
    DateOfBirth DATE,
    Email NVARCHAR(100),
    PreferredLanguage NVARCHAR(50),
    SustainabilityPreference NVARCHAR(100),
    CarbonOffsetParticipation BIT
);


-- 4. Tour_Operator Table
CREATE TABLE Tour_Operator (
    OperatorID INT PRIMARY KEY IDENTITY,
    OperatorName NVARCHAR(100) NOT NULL,
    Headquarters NVARCHAR(100),
    SustainabilityCertification NVARCHAR(100),
    LocalPartnershipPercentage DECIMAL(5, 2),
    CarbonOffsetProgram NVARCHAR(100),
    SustainablePackagesOffered INT
);


-- 5. Attraction Table
CREATE TABLE Attraction (
    AttractionID INT PRIMARY KEY IDENTITY,
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
    AttractionName NVARCHAR(100) NOT NULL,
    AttType NVARCHAR(50),
    Capacity INT,
    AverageVisitDuration DECIMAL(5, 2),
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    PeakHours NVARCHAR(50),
    SustainabilityMeasures NVARCHAR(200),
    AccessibilityFeatures BIT
);


-- 6. Transportation_Provider Table
CREATE TABLE Transportation_Provider (
    ProviderID INT PRIMARY KEY IDENTITY,
    ProviderName NVARCHAR(100) NOT NULL,
    TpType NVARCHAR(50),
    TP_SustainabilityScore DECIMAL(5, 2),
    EmissionsPerPassengerKm DECIMAL(5, 2),
    RenewableEnergyPercentage DECIMAL(5, 2),
    TP_AccessibilityFeatures BIT
);


-- 7. Local_Business Table
CREATE TABLE Local_Business (
    BusinessID INT PRIMARY KEY IDENTITY,
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
    BusinessName NVARCHAR(100) NOT NULL,
    LcoBType NVARCHAR(50),
    OwnershipType NVARCHAR(50),
    EmployeeCount INT,
    SustainabilityPractices NVARCHAR(200),
    LocalSourcedProductPercentage DECIMAL(5, 2)
);


-- 8. Sustainability_Certification Table
CREATE TABLE Sustainability_Certification (
    CertificationID INT PRIMARY KEY IDENTITY,
    CertificateName NVARCHAR(100),
    IssuingBody NVARCHAR(100),
    ValidityPeriod DATE,
    CriteriaDescription NVARCHAR(200),
    AuditFrequency NVARCHAR(50)
);


-- 9. Environmental_Impact Table
CREATE TABLE Environmental_Impact (
    EVTImpactID INT PRIMARY KEY IDENTITY,
    AccommodationID INT FOREIGN KEY REFERENCES Accommodation(AccommodationID),
```

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    EnvImp_Date DATE,
    CarbonEmissions DECIMAL(10, 2),
    WaterConsumption DECIMAL(10, 2),
    WasteGenerated DECIMAL(10, 2),
    RecyclingRate DECIMAL(5, 2),
    BiodiversityIndex DECIMAL(5, 2)
);


-- 10. Economic_Impact Table
CREATE TABLE Economic_Impact (
    ECOImpactID INT PRIMARY KEY IDENTITY,
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
    EcoImp_Year INT,
    TourismRevenue DECIMAL(15, 2),
    LocalEmploymentRate DECIMAL(5, 2),
    AverageWageInTourism DECIMAL(10, 2),
    LocalBusinessGrowthRate DECIMAL(5, 2),
    EconomicLeakagePercentage DECIMAL(5, 2)
);


-- 11. Cultural_Heritage_Site Table
CREATE TABLE Cultural_Heritage_Site (
    SiteID INT PRIMARY KEY IDENTITY,
    AttractionID INT UNIQUE FOREIGN KEY REFERENCES Attraction(AttractionID),
    SiteName NVARCHAR(100) NOT NULL,
    SiteType NVARCHAR(50),
    YearEstablished INT,
    ProtectionStatus NVARCHAR(50),
    CulturalSignificance NVARCHAR(200)
);


-- 12. Visitor_Review Table
CREATE TABLE Visitor_Review (
    ReviewID INT PRIMARY KEY IDENTITY,
    TouristID INT FOREIGN KEY REFERENCES Tourist(TouristID),
    EntityReviewed NVARCHAR(100),
    Rating INT CHECK (Rating BETWEEN 1 AND 5),
    Comment NVARCHAR(500),
    SustainabilityFeedback NVARCHAR(200),
    DatePosted DATE
);
```

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-- 13. Sustainability_Metric Table
CREATE TABLE Sustainability_Metric (
    MetricID INT PRIMARY KEY IDENTITY,
    MetricName NVARCHAR(100),
    SusMet_Description NVARCHAR(200),
    Unit NVARCHAR(50),
    BenchmarkValue DECIMAL(10, 2),
    DataCollectionMethod NVARCHAR(100),
    FrequencyOfMeasurement NVARCHAR(50)
);


-- 14. Educational_Content Table
CREATE TABLE Educational_Content (
    ContentID INT PRIMARY KEY IDENTITY,
    Title NVARCHAR(100),
    EduType NVARCHAR(50),
    Topic NVARCHAR(100),
    Edu_Language NVARCHAR(50),
    TargetAudience NVARCHAR(50),
    EngagementRate DECIMAL(5, 2),
    LastUpdated DATE
);


-- 15. Carrying_Capacity_Alert Table
CREATE TABLE Carrying_Capacity_Alert (
    AlertID INT PRIMARY KEY IDENTITY,
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
    CCA_Date DATE,
    CurrentVisitorCount INT,
    ThresholdPercentage DECIMAL(5, 2),
    AlertLevel NVARCHAR(50),
    RecommendedActions NVARCHAR(200)
);



-- Associative entities

-- 1. Visits Table
CREATE TABLE Visits (
    TouristID INT FOREIGN KEY REFERENCES Tourist(TouristID),
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
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    Visit_Timestamp DATETIME,
    PRIMARY KEY (TouristID, DestinationID)
);


-- 2. Stays_At Table
CREATE TABLE Stays_At (
    TouristID INT FOREIGN KEY REFERENCES Tourist(TouristID),
    AccommodationID INT FOREIGN KEY REFERENCES Accommodation(AccommodationID),
    Stay_Period NVARCHAR(50),
    PRIMARY KEY (TouristID, AccommodationID)
);


-- 3. Uses Table
CREATE TABLE Uses (
    TouristID INT FOREIGN KEY REFERENCES Tourist(TouristID),
    ProviderID INT FOREIGN KEY REFERENCES Transportation_Provider(ProviderID),
    Transportation_Duration INT,
    PRIMARY KEY (TouristID, ProviderID),
    CONSTRAINT CHK_Transportation_Duration CHECK (Transportation_Duration > 0)
);


-- 4. Engages_With Table
CREATE TABLE Engages_With (
    TouristID INT FOREIGN KEY REFERENCES Tourist(TouristID),
    ContentID INT FOREIGN KEY REFERENCES Educational_Content(ContentID),
    Education_Domain NVARCHAR(100),
    PRIMARY KEY (TouristID, ContentID)
);


-- 5. Organizes Table
CREATE TABLE Organizes (
    OperatorID INT FOREIGN KEY REFERENCES Tour_Operator(OperatorID),
    DestinationID INT FOREIGN KEY REFERENCES Destination(DestinationID),
    Number_of_Tourists INT,
    PRIMARY KEY (OperatorID, DestinationID),
    CONSTRAINT CHK_Number_of_Tourists CHECK (Number_of_Tourists > 0)
);


-- 6. Partners_With Table
CREATE TABLE Partners_With (
    OperatorID INT FOREIGN KEY REFERENCES Tour_Operator(OperatorID),
    AccommodationID INT FOREIGN KEY REFERENCES Accommodation(AccommodationID),
```

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    Partnership_StartDate DATE,
    Partnership_EndDate DATE,
    PRIMARY KEY (OperatorID, AccommodationID),
    CONSTRAINT CHK_Partnership_Dates CHECK (Partnership_EndDate IS NULL OR
Partnership_EndDate >= Partnership_StartDate)
);


-- 7. Collaborates_With Table
CREATE TABLE Collaborates_With (
    OperatorID INT FOREIGN KEY REFERENCES Tour_Operator(OperatorID),
    ProviderID INT FOREIGN KEY REFERENCES Transportation_Provider(ProviderID),
    Collaboration_StartDate DATE,
    Collaboration_EndDate DATE,
    PRIMARY KEY (OperatorID, ProviderID)
);


-- 8. Visits_Attraction Table
CREATE TABLE Visits_Attraction (
    TouristID INT FOREIGN KEY REFERENCES Tourist(TouristID),
    AttractionID INT FOREIGN KEY REFERENCES Attraction(AttractionID),
    Days_of_Visit NVARCHAR(50),
    PRIMARY KEY (TouristID, AttractionID)
);


-- 9. Business_Impact Table
CREATE TABLE Business_Impact (
    BusinessID INT FOREIGN KEY REFERENCES Local_Business(BusinessID),
    ImpactID INT FOREIGN KEY REFERENCES Economic_Impact(ECOImpactID),
    Revenue_Generated DECIMAL(15, 2),
    PRIMARY KEY (BusinessID, ImpactID)
);


-- 10. Economic_Metric Table
CREATE TABLE Economic_Metric (
    Eco_ImpactID INT FOREIGN KEY REFERENCES Economic_Impact(ECOImpactID),
    MetricID INT FOREIGN KEY REFERENCES Sustainability_Metric(MetricID),
    Eco_Metric_Timestamp DATETIME,
    PRIMARY KEY (Eco_ImpactID, MetricID)
);


-- 11. Environmental_Metric Table
CREATE TABLE Environmental_Metric (
```

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    Evt_ImpactID INT FOREIGN KEY REFERENCES Environmental_Impact(EVTImpactID),
    MetricID INT FOREIGN KEY REFERENCES Sustainability_Metric(MetricID),
    EVT_Metric_Timestamp DATETIME,
    PRIMARY KEY (Evt_ImpactID, MetricID)
);


-- 12. Certificate_Metric Table
CREATE TABLE Certificate_Metric (
    CertificateID INT FOREIGN KEY REFERENCES
Sustainability_Certification(CertificationID),
    MetricID INT FOREIGN KEY REFERENCES Sustainability_Metric(MetricID),
    Compliance_Rating DECIMAL(5, 2),
    PRIMARY KEY (CertificateID, MetricID)
);


-- 13. Accommodation_Certification Table
CREATE TABLE Accommodation_Certification (
    AccommodationID INT FOREIGN KEY REFERENCES Accommodation(AccommodationID),
    CertificateID INT FOREIGN KEY REFERENCES
Sustainability_Certification(CertificationID),
    Certification_Grade NVARCHAR(10),
    PRIMARY KEY (AccommodationID, CertificateID)
);
```

DML Script: INSERT statements

```sql
--DESTINATION

INSERT INTO Destination (DestinationName, Country, Region, Climate, PeakSeason,
OffSeason, AverageAnnualVisitors, SustainabilityScore, CarryingCapacity)
VALUES
  ('Grand Canyon', 'USA', 'Arizona', 'Desert', 'Spring', 'Winter', 6000000, 85.50,
700000),
  ('Great Barrier Reef', 'Australia', 'Queensland', 'Tropical', 'Winter', 'Summer',
2000000, 90.75, 500000),
  ('Machu Picchu', 'Peru', 'Cusco', 'Mountain', 'Spring', 'Fall', 1500000, 78.20,
400000),
  ('Yellowstone National Park', 'USA', 'Wyoming', 'Temperate', 'Summer', 'Winter',
4000000, 88.10, 600000),
  ('Santorini', 'Greece', 'Cyclades', 'Mediterranean', 'Summer', 'Winter', 2000000,
70.25, 150000),
  ('Banff National Park', 'Canada', 'Alberta', 'Mountain', 'Summer', 'Winter',
4000000, 82.50, 800000),
  ('Eiffel Tower', 'France', 'Île-de-France', 'Temperate', 'Spring', 'Winter',
7000000, 65.30, 300000),
  ('Mount Fuji', 'Japan', 'Honshu', 'Mountain', 'Spring', 'Winter', 4000000, 75.40,
500000),
  ('Serengeti National Park', 'Tanzania', 'Mara', 'Savannah', 'Summer', 'Winter',
350000, 92.60, 100000),
  ('Galapagos Islands', 'Ecuador', 'Pacific', 'Tropical', 'Winter', 'Summer', 200000,
95.00, 50000);

--ACCOMODATION-

INSERT INTO Accommodation (DestinationID, AccommodationName, AccType, Capacity,
SustainabilityRating, EnergyEfficiencyScore, WaterConservationScore,
WasteManagementScore, LocalEmploymentPercentage)
VALUES
  (1, 'Grand Canyon Lodge', 'Hotel', 200, 85.20, 90.00, 80.50, 75.30, 65.00),
  (2, 'Reef View Hotel', 'Resort', 150, 88.40, 92.20, 78.50, 70.10, 60.00),
  (3, 'Inca Trail Hostel', 'Hostel', 50, 70.50, 65.30, 80.00, 60.50, 55.00),
  (4, 'Yellowstone Cabin', 'Cabin', 100, 82.00, 85.20, 75.00, 68.40, 72.00),
  (5, 'Santorini Sunset Villas', 'Villa', 120, 78.90, 73.60, 65.80, 70.00, 58.00),
  (6, 'Banff Mountain Lodge', 'Lodge', 250, 90.20, 88.10, 90.00, 85.30, 80.00),
  (7, 'Parisian Boutique', 'Boutique Hotel', 75, 66.50, 68.00, 72.00, 65.20, 50.00),
  (8, 'Fuji View Inn', 'Inn', 60, 74.30, 72.50, 75.60, 68.90, 57.00),
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    (9, 'Serengeti Eco Camp', 'Camp', 40, 92.80, 94.00, 88.50, 90.00, 85.00),
    (10, 'Galapagos Green Resort', 'Eco-Resort', 100, 95.60, 98.20, 92.40, 93.00,
90.00);


--TOURIST-

INSERT INTO Tourist (FirstName, LastName, Nationality, DateOfBirth, Email,
PreferredLanguage, SustainabilityPreference, CarbonOffsetParticipation)
VALUES
    ('John', 'Doe', 'USA', '1985-05-10', 'john.doe@example.com', 'English',
'Eco-friendly accommodations', 1),
    ('Maria', 'Garcia', 'Spain', '1990-08-23', 'maria.garcia@example.es', 'Spanish',
'Low-emission transport', 1),
    ('Liam', 'Brown', 'Canada', '1982-11-15', 'liam.brown@example.ca', 'English', 'Local
food sourcing', 0),
    ('Emma', 'Wilson', 'UK', '1995-01-20', 'emma.wilson@example.co.uk', 'English',
'Plastic-free initiatives', 1),
    ('Noah', 'Chen', 'China', '1988-07-12', 'noah.chen@example.cn', 'Mandarin',
'Carbon-neutral travel', 1),
    ('Olivia', 'Martin', 'France', '1993-04-09', 'olivia.martin@example.fr', 'French',
'Eco-friendly accommodations', 0),
    ('William', 'Singh', 'India', '1987-03-25', 'william.singh@example.in', 'Hindi',
'Water conservation efforts', 1),
    ('Sophia', 'Kim', 'South Korea', '1992-06-30', 'sophia.kim@example.kr', 'Korean',
'Recycling programs', 1),
    ('James', 'Nguyen', 'Vietnam', '1996-02-14', 'james.nguyen@example.vn',
'Vietnamese', 'Eco-tourism activities', 0),
    ('Mia', 'Lopez', 'Mexico', '1984-12-05', 'mia.lopez@example.mx', 'Spanish', 'Support
local communities', 1);


--TOUR_OPERATOR-

INSERT INTO Tour_Operator (OperatorName, Headquarters, SustainabilityCertification,
LocalPartnershipPercentage, CarbonOffsetProgram, SustainablePackagesOffered)
VALUES
    ('Eco Adventures', 'San Francisco, USA', 'Green Globe', 85.50, 'Climate Neutral
Now', 12),
    ('Green Travels', 'Berlin, Germany', 'EarthCheck', 90.00, 'Carbon Fund', 8),
    ('Sustainable Journeys', 'Sydney, Australia', 'Travelife', 78.25, 'Offsetters', 10),
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  ('Nature Expeditions', 'Cape Town, South Africa', 'Biosphere', 70.80, 'MyClimate',
15),
  ('Planet Protectors', 'London, UK', 'Green Key', 88.40, 'Carbon Trust', 7),
  ('Eco Escapes', 'Toronto, Canada', 'EcoLabel', 82.60, 'Gold Standard', 6),
  ('Adventure Conserve', 'Auckland, New Zealand', 'Green Tourism', 95.20, 'Carbon
Neutral', 9),
  ('Wilderness Safaris', 'Nairobi, Kenya', 'Eco-Certified', 87.00, 'Cool Effect', 11),
  ('Responsible Travels', 'Stockholm, Sweden', 'Travelife', 77.40, 'COTAP', 14),
  ('Pure Earth Tours', 'Lima, Peru', 'Green Seal', 80.50, 'Climate Action Reserve',
5);


--ATTRACTION -

INSERT INTO Attraction (DestinationID, AttractionName, AttType, Capacity,
AverageVisitDuration, PeakHours, SustainabilityMeasures, AccessibilityFeatures)
VALUES
  (1, 'Bright Angel Trail', 'Hiking Trail', 300, 2.50, 'Morning', 'Waste bins along
trail, solar lighting', 1),
  (2, 'Great Barrier Reef Marine Park', 'Marine Reserve', 500, 4.00, 'Afternoon',
'Coral regeneration projects, limited access zones', 0),
  (3, 'Machu Picchu Historic Sanctuary', 'Historical Site', 250, 3.00, 'Early
Morning', 'Controlled entry, waste management programs', 1),
  (4, 'Old Faithful Geyser', 'Natural Wonder', 400, 1.50, 'Noon', 'Visitor guidelines,
geothermal protection', 1),
  (5, 'Santorini Caldera', 'Volcanic Site', 200, 2.00, 'Sunset', 'Recycling stations,
eco-friendly tours', 0),
  (6, 'Lake Louise', 'Scenic Lake', 300, 3.00, 'Afternoon', 'Boating restrictions,
wildlife conservation zones', 1),
  (7, 'Eiffel Tower', 'Monument', 1000, 2.00, 'Evening', 'Recycling facilities, LED
lighting', 1),
  (8, 'Mount Fuji Hiking Trails', 'Mountain', 350, 5.00, 'Morning', 'Litter collection
points, eco-friendly signage', 1),
  (9, 'Serengeti Wildlife Safari', 'National Park', 150, 6.00, 'Morning', 'Vehicle
limits, guided tours only', 0),
  (10, 'Charles Darwin Research Station', 'Research Center', 100, 2.50, 'Afternoon',
'Conservation programs, educational displays', 1);
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--TRANSPORTATION_PROVIDER-

INSERT INTO Transportation_Provider (ProviderName, TpType, TP_SustainabilityScore,
EmissionsPerPassengerKm, RenewableEnergyPercentage, TP_AccessibilityFeatures)
VALUES
   ('EcoTrans', 'Electric Bus', 90.50, 0.02, 100.00, 1),
   ('GreenAir', 'Airline', 78.40, 0.15, 45.00, 1),
   ('SolarExpress', 'Train', 85.20, 0.05, 80.00, 1),
   ('BioRide', 'Hybrid Taxi', 72.30, 0.10, 55.00, 0),
   ('ZeroEmission Cruises', 'Cruise', 88.75, 0.08, 65.00, 1),
   ('NatureBus', 'Shuttle', 92.10, 0.03, 90.00, 1),
   ('EcoWheels', 'Bike Rental', 95.00, 0.00, 100.00, 0),
   ('HybridFly', 'Airline', 69.80, 0.20, 30.00, 1),
   ('GreenCab', 'Electric Taxi', 80.60, 0.07, 85.00, 1),
   ('SunPower Rail', 'Solar Train', 93.50, 0.01, 95.00, 1);




--LOCAL_BUSINESS-

INSERT INTO Local_Business (DestinationID, BusinessName, LcoBType, OwnershipType,
EmployeeCount, SustainabilityPractices, LocalSourcedProductPercentage)
VALUES
   (1, 'Grand Canyon Coffee Co.', 'Cafe', 'Locally Owned', 12, 'Recyclable cups,
composting program', 85.00),
   (2, 'Reef Market', 'Souvenir Shop', 'Family Owned', 8, 'Biodegradable packaging,
local crafts', 90.00),
   (3, 'Machu Picchu Restaurant', 'Restaurant', 'Franchise', 20, 'Locally sourced
ingredients, water conservation', 75.00),
   (4, 'Yellowstone Outfitters', 'Outdoor Gear Store', 'Partnership', 15, 'Recycled
products, eco-friendly packaging', 80.00),
   (5, 'Santorini Sun Rentals', 'Bike Rental', 'Private', 5, 'Electric bikes, paperless
receipts', 65.00),
   (6, 'Banff Artisan Gallery', 'Art Gallery', 'Locally Owned', 7, 'Local artist
support, minimal packaging', 95.00),
   (7, 'Parisian Bistro', 'Restaurant', 'Franchise', 18, 'Organic ingredients,
sustainable seafood', 70.00),
   (8, 'Fuji Mountain Gifts', 'Gift Shop', 'Family Owned', 10, 'Reusable bags,
eco-friendly souvenirs', 85.00),
   (9, 'Serengeti Safari Supply', 'Outdoor Gear Store', 'Private', 6, 'Biodegradable
packaging, local crafts', 88.00),
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    (10, 'Galapagos Eco Tours', 'Tour Operator', 'Locally Owned', 25, 'Solar-powered
vehicles, no single-use plastics', 92.00);


--SUSTAINABILITY_CERTIFICATION-

INSERT INTO Sustainability_Certification (CertificateName, IssuingBody,
ValidityPeriod, CriteriaDescription, AuditFrequency)
VALUES
    ('Green Globe Certification', 'Green Globe', '2026-12-31', 'Environmental, social,
and economic sustainability standards', 'Annually'),
    ('LEED Certification', 'U.S. Green Building Council', '2025-06-30', 'Energy
efficiency, water conservation, and eco-friendly design', 'Every 3 years'),
    ('ISO 14001', 'International Organization for Standardization', '2027-09-15',
'Environmental management system requirements', 'Every 2 years'),
    ('Travelife Partner', 'Travelife', '2026-03-10', 'Sustainability and social
responsibility in tourism', 'Annually'),
    ('EarthCheck', 'EarthCheck', '2024-11-25', 'Sustainable tourism benchmarks and
certification', 'Every 2 years'),
    ('BREEAM Certification', 'BRE Global', '2025-05-20', 'Environmental performance
assessment for buildings', 'Every 3 years'),
    ('Green Seal Certification', 'Green Seal', '2027-02-28', 'Environmental health and
safety standards', 'Annually'),
    ('EcoLabel', 'European Union', '2026-07-15', 'Eco-friendly products and services
across sectors', 'Every 2 years'),
    ('Rainforest Alliance Certified', 'Rainforest Alliance', '2025-10-31', 'Biodiversity
conservation and sustainable livelihoods', 'Annually'),
    ('Carbon Trust Standard', 'Carbon Trust', '2027-08-05', 'Carbon, water, and waste
footprint reductions', 'Every 3 years');

--ENVIRONMENTAL_IMPACT -

INSERT INTO Environmental_Impact (AccommodationID, EnvImp_Date, CarbonEmissions,
WaterConsumption, WasteGenerated, RecyclingRate, BiodiversityIndex)
VALUES
    (1, '2024-01-15', 1500.25, 1200.50, 300.75, 85.50, 72.30),
    (2, '2024-02-10', 980.40, 800.60, 200.45, 78.40, 68.20),
    (3, '2024-03-12', 1250.75, 1100.20, 250.90, 80.00, 70.55),
    (4, '2024-04-05', 1025.80, 950.40, 275.35, 82.00, 71.20),
    (5, '2024-05-18', 1150.95, 1050.30, 290.50, 79.25, 69.85),
    (6, '2024-06-21', 1400.30, 1150.70, 310.85, 83.75, 73.10),
    (7, '2024-07-08', 1325.65, 1075.45, 285.75, 77.30, 68.90),
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    (8, '2024-08-03', 1450.50, 1125.35, 295.20, 84.50, 72.80),
    (9, '2024-09-15', 990.60, 900.50, 250.00, 79.80, 70.00),
    (10, '2024-10-10', 1050.20, 950.75, 260.35, 81.25, 71.90);


--ECONOMIC_IMPACT -

INSERT INTO Economic_Impact (DestinationID, EcoImp_Year, TourismRevenue,
LocalEmploymentRate, AverageWageInTourism, LocalBusinessGrowthRate,
EconomicLeakagePercentage)
VALUES
    (1, 2023, 15000000.00, 72.50, 28000.50, 5.20, 12.50),
    (2, 2023, 18000000.00, 68.20, 30000.75, 6.00, 15.80),
    (3, 2023, 12000000.00, 75.00, 25000.60, 4.80, 11.40),
    (4, 2023, 14000000.00, 70.10, 26500.25, 5.50, 13.00),
    (5, 2023, 10000000.00, 65.50, 22000.80, 3.90, 14.20),
    (6, 2023, 20000000.00, 77.00, 31000.90, 6.30, 10.50),
    (7, 2023, 9000000.00, 60.80, 21000.00, 3.50, 15.00),
    (8, 2023, 17000000.00, 72.90, 29500.20, 5.10, 12.00),
    (9, 2023, 11000000.00, 67.40, 23500.65, 4.70, 13.80),
    (10, 2023, 16000000.00, 74.00, 27500.30, 5.60, 11.20);




--CULTURAL_HERITAGE_SITE

INSERT INTO Cultural_Heritage_Site (AttractionID, SiteName, SiteType, YearEstablished,
ProtectionStatus, CulturalSignificance)
VALUES
    (1, 'Bright Angel Trail', 'Natural Site', 1919, 'Protected', 'Part of Grand Canyon
National Park, significant for natural beauty and geological history.'),
    (2, 'Great Barrier Reef', 'Marine Site', 1981, 'UNESCO World Heritage', 'One of the
largest coral reef systems in the world, crucial for marine biodiversity.'),
    (3, 'Machu Picchu', 'Archaeological Site', 1450, 'Protected', 'Ancient Incan city, a
symbol of the Incan Empire and a UNESCO World Heritage site.'),
    (4, 'Old Faithful Geyser', 'Natural Monument', 1872, 'Protected', 'World-famous
geyser in Yellowstone, known for its reliable eruptions.'),
    (5, 'Santorini Caldera', 'Volcanic Site', 1645, 'Protected', 'Formed by a massive
volcanic eruption, significant for geological history.'),
    (6, 'Lake Louise', 'Natural Site', 1890, 'National Historic Site', 'Famous glacier
lake in Canada, known for its scenic beauty and cultural value.'),
    (7, 'Eiffel Tower', 'Architectural Monument', 1889, 'Protected', 'Iconic French
monument and symbol of Paris, significant for engineering and design.'),
```

```sql
    (8, 'Mount Fuji', 'Cultural Landscape', 2013, 'UNESCO World Heritage', 'Sacred
mountain and symbol of Japan, important for religious and cultural significance.'),
    (9, 'Serengeti National Park', 'Natural Site', 1951, 'UNESCO World Heritage',
'Renowned for its biodiversity, particularly the migration of wildebeest and other
species.'),
    (10, 'Charles Darwin Research Station', 'Research Center', 1964, 'Protected',
'Center for conservation and scientific research in the Galapagos Islands.');

--Visitors _review

INSERT INTO Visitor_Review (TouristID, EntityReviewed, Rating, Comment,
SustainabilityFeedback, DatePosted)
VALUES
    (1, 'Eco Lodge', 5, 'Amazing stay with great views and sustainable practices.',
'Encourages water conservation', '2024-01-15'),
    (2, 'Mountain Cabin', 4, 'Cozy and peaceful, but limited sustainable options.',
'Could improve recycling efforts', '2024-02-20'),
    (3, 'City Hotel', 3, 'Convenient location but needs more eco-friendly practices.',
'Minimal energy-saving initiatives', '2024-03-12'),
    (4, 'Beach Resort', 5, 'Perfect for a relaxing vacation with eco-friendly
measures.', 'Focus on reducing plastic usage', '2024-04-25'),
    (5, 'Safari Lodge', 4, 'Great experience, but could improve on waste management.',
'Focus on wildlife protection', '2024-05-08'),
    (6, 'Boutique Inn', 2, 'Disappointed with the lack of sustainable practices.',
'Minimal sustainability initiatives', '2024-06-18'),
    (7, 'Forest Cabin', 5, 'Lovely place with eco-friendly efforts all around.', 'Uses
solar power for electricity', '2024-07-10'),
    (8, 'Lake House', 4, 'Scenic views but needs more eco-friendly policies.',
'Encourages local food sourcing', '2024-08-14'),
    (9, 'Desert Camp', 3, 'Unique experience but could improve sustainability.',
'Limited water-saving practices', '2024-09-05'),
    (10, 'Island Villa', 5, 'Luxurious and eco-conscious.', 'Uses renewable energy
sources', '2024-10-20');

-- Sustainability_Metric Table

INSERT INTO Sustainability_Metric (MetricName, SusMet_Description, Unit,
BenchmarkValue, DataCollectionMethod, FrequencyOfMeasurement)
VALUES
('Carbon Footprint', 'Measures total greenhouse gas emissions', 'Metric Tons CO2e',
1000.00, 'GHG Protocol', 'Annually'),
```

```sql
('Water Usage', 'Total water consumption', 'Cubic Meters', 5000.00, 'Water Meters',
'Monthly'),
('Energy Efficiency', 'Energy used per unit of production', 'kWh/Unit', 50.00, 'Energy
Audits', 'Quarterly'),
('Waste Reduction', 'Percentage of waste diverted from landfill', 'Percentage', 75.00,
'Waste Audits', 'Monthly'),
('Renewable Energy Usage', 'Percentage of energy from renewable sources',
'Percentage', 30.00, 'Energy Bills', 'Annually'),
('Employee Diversity', 'Percentage of diverse employees', 'Percentage', 40.00, 'HR
Records', 'Bi-annually'),
('Supplier Sustainability', 'Percentage of suppliers meeting sustainability criteria',
'Percentage', 80.00, 'Supplier Assessments', 'Annually'),
('Product Recyclability', 'Percentage of product that can be recycled', 'Percentage',
90.00, 'Product Analysis', 'Per Product Launch'),
('Community Investment', 'Amount invested in community projects', 'USD', 100000.00,
'Financial Records', 'Annually'),
('Biodiversity Impact', 'Net Positive Impact on biodiversity', 'Hectares', 500.00,
'Environmental Surveys', 'Bi-annually');

-- Educational_Content Table

INSERT INTO Educational_Content (Title, EduType, Topic, Edu_Language, TargetAudience,
EngagementRate, LastUpdated)
VALUES
('Sustainable Tourism 101', 'Online Course', 'Sustainability Basics', 'English',
'Tourists', 85.5, '2023-05-15'),
('Eco-Friendly Travel Tips', 'Video', 'Travel', 'Spanish', 'Backpackers', 92.3,
'2023-06-01'),
('Local Culture Preservation', 'Webinar', 'Cultural Heritage', 'French', 'Tour
Operators', 78.9, '2023-04-22'),
('Reducing Carbon Footprint', 'Podcast', 'Climate Change', 'German', 'Eco-Conscious
Travelers', 88.7, '2023-07-10'),
('Sustainable Accommodations', 'E-book', 'Hospitality', 'Italian', 'Hotel Managers',
76.2, '2023-03-30'),
('Wildlife Conservation', 'Interactive Module', 'Biodiversity', 'English', 'Nature
Enthusiasts', 91.5, '2023-06-18'),
('Responsible Diving Practices', 'Video Series', 'Marine Conservation', 'Thai',
'Divers', 87.8, '2023-05-05'),
('Sustainable Food Tourism', 'Blog Posts', 'Culinary Travel', 'Japanese', 'Foodies',
82.1, '2023-07-01'),
('Eco-Volunteering Guide', 'PDF Guide', 'Voluntourism', 'Portuguese', 'Gap Year
Students', 79.4, '2023-04-12'),
```

```sql
('Green Transportation Options', 'Infographic', 'Sustainable Mobility', 'Chinese',
'Urban Travelers', 86.9, '2023-06-25');



-- Carrying_Capacity_Alert Table

INSERT INTO Carrying_Capacity_Alert (DestinationID, CCA_Date, CurrentVisitorCount,
ThresholdPercentage, AlertLevel, RecommendedActions)
VALUES
(1, '2023-07-15', 5000, 90.5, 'High', 'Implement visitor quota'),
(2, '2023-07-16', 3000, 75.0, 'Medium', 'Increase monitoring'),
(3, '2023-07-17', 8000, 95.2, 'Critical', 'Temporary closure recommended'),
(4, '2023-07-18', 2000, 50.0, 'Low', 'Continue normal operations'),
(5, '2023-07-19', 6000, 85.7, 'High', 'Limit new bookings'),
(6, '2023-07-20', 4000, 80.0, 'Medium', 'Prepare for potential restrictions'),
(7, '2023-07-21', 7000, 93.3, 'Critical', 'Immediate action required'),
(8, '2023-07-22', 1000, 25.0, 'Low', 'No action needed'),
(9, '2023-07-23', 5500, 91.7, 'High', 'Implement crowd management'),
(10, '2023-07-24', 3500, 70.0, 'Medium', 'Increase staff presence');
```

INSERT STATEMENTS for ASSOCIATIVE ENTITIES:

```sql
--1. Visits Table

INSERT INTO Visits (TouristID, DestinationID, Visit_Timestamp)
VALUES
  (1, 1, '2024-01-10 10:30:00'),
  (2, 2, '2024-02-15 12:45:00'),
  (3, 3, '2024-03-20 09:15:00'),
  (4, 4, '2024-04-05 14:30:00'),
  (5, 5, '2024-05-08 16:00:00'),
  (6, 6, '2024-06-18 11:20:00'),
  (7, 7, '2024-07-10 13:45:00'),
  (8, 8, '2024-08-14 10:00:00'),
  (9, 9, '2024-09-05 17:30:00'),
  (10, 10, '2024-10-20 08:00:00'),
```

```sql
  (1, 3, '2024-02-28 15:10:00'),
  (2, 4, '2024-03-15 10:50:00'),
  (3, 1, '2024-04-12 09:40:00'),
  (4, 2, '2024-05-30 12:00:00'),
  (5, 10, '2024-06-22 14:25:00'),
  (6, 9, '2024-07-18 15:35:00'),
  (7, 8, '2024-08-24 11:55:00'),
  (8, 7, '2024-09-16 08:15:00'),
  (9, 6, '2024-10-12 10:05:00'),
  (10, 5, '2024-11-01 16:20:00');




--2. Stays_At Table

INSERT INTO Stays_At (TouristID, AccommodationID, Stay_Period)
VALUES
  (1, 1, '2024-01-05 to 2024-01-10'),
  (2, 2, '2024-02-10 to 2024-02-15'),
  (3, 3, '2024-03-15 to 2024-03-20'),
  (4, 4, '2024-04-01 to 2024-04-05'),
  (5, 5, '2024-05-05 to 2024-05-08'),
  (6, 6, '2024-06-12 to 2024-06-18'),
  (7, 7, '2024-07-05 to 2024-07-10'),
  (8, 8, '2024-08-10 to 2024-08-14'),
  (9, 9, '2024-09-01 to 2024-09-05'),
  (10, 10, '2024-10-15 to 2024-10-20'),
  (1, 3, '2024-02-20 to 2024-02-28'),
  (2, 4, '2024-03-10 to 2024-03-15'),
  (3, 1, '2024-04-08 to 2024-04-12'),
  (4, 2, '2024-05-20 to 2024-05-30'),
  (5, 10, '2024-06-15 to 2024-06-22'),
  (6, 9, '2024-07-10 to 2024-07-18'),
  (7, 8, '2024-08-18 to 2024-08-24'),
  (8, 7, '2024-09-08 to 2024-09-16'),
  (9, 6, '2024-10-05 to 2024-10-12'),
  (10, 5, '2024-10-25 to 2024-11-01');
```

```sql
--3. Uses Table

INSERT INTO Uses (TouristID, ProviderID, Transportation_Duration)
VALUES
  (1, 1, 120),
  (2, 2, 180),
  (3, 3, 240),
  (4, 4, 90),
  (5, 5, 300),
  (6, 6, 150),
  (7, 7, 60),
  (8, 8, 220),
  (9, 9, 110),
  (10, 10, 130),
  (1, 2, 180),
  (2, 3, 210),
  (3, 1, 100),
  (4, 5, 275),
  (5, 6, 160),
  (6, 4, 125),
  (7, 9, 85),
  (8, 10, 140),
  (9, 8, 200),
  (10, 7, 95);




--4. Engages_With Table

INSERT INTO Engages_With (TouristID, ContentID, Education_Domain)
VALUES
  (1, 1, 'Sustainable Tourism'),
  (2, 2, 'Eco-Friendly Travel'),
  (3, 3, 'Cultural Heritage'),
  (4, 4, 'Climate Change'),
```

```sql
  (5, 5, 'Hospitality'),
  (6, 6, 'Biodiversity'),
  (7, 7, 'Marine Conservation'),
  (8, 8, 'Culinary Travel'),
  (9, 9, 'Voluntourism'),
  (10, 10, 'Sustainable Mobility'),
  (1, 3, 'Cultural Heritage'),
  (2, 5, 'Hospitality'),
  (3, 7, 'Marine Conservation'),
  (4, 9, 'Voluntourism'),
  (5, 10, 'Sustainable Mobility'),
  (6, 2, 'Eco-Friendly Travel'),
  (7, 4, 'Climate Change'),
  (8, 6, 'Biodiversity'),
  (9, 1, 'Sustainable Tourism'),
  (10, 8, 'Culinary Travel');




--5. Organizes Table

INSERT INTO Organizes (OperatorID, DestinationID, Number_of_Tourists) VALUES
(1, 1, 20),
(2, 2, 25),
(3, 3, 30),
(4, 4, 15),
(5, 5, 18),
(6, 6, 22),
(7, 7, 24),
(8, 8, 16),
(9, 9, 28),
(10, 10, 20);


--6. Partners_With Table

INSERT INTO Partners_With (OperatorID, AccommodationID, Partnership_StartDate,
Partnership_EndDate)
VALUES
  (1, 1, '2023-01-01', '2024-01-01'),
  (2, 2, '2023-02-01', NULL),
```

```sql
  (3, 3, '2023-03-15', '2024-03-15'),
  (4, 4, '2023-04-10', '2025-04-10'),
  (5, 5, '2023-05-20', '2024-05-20'),
  (6, 6, '2023-06-15', NULL),
  (7, 7, '2023-07-18', '2024-07-18'),
  (8, 8, '2023-08-10', '2025-08-10'),
  (9, 9, '2023-09-05', NULL),
  (10, 10, '2023-10-01', '2024-10-01');
```

--7. Collaborates_With Table

```sql
INSERT INTO Collaborates_With (OperatorID, ProviderID, Collaboration_StartDate,
Collaboration_EndDate)
VALUES
  (1, 1, '2022-01-01', NULL),
  (2, 2, '2023-01-01', '2024-01-01'),
  (3, 3, '2023-03-01', NULL),
  (4, 4, '2023-04-15', '2024-04-15'),
  (5, 5, '2023-05-01', NULL),
  (6, 6, '2023-06-10', '2025-06-10'),
  (7, 7, '2023-07-15', NULL),
  (8, 8, '2023-08-20', '2024-08-20'),
  (9, 9, '2023-09-01', NULL),
  (10, 10, '2023-10-01', '2024-10-01');
```

--8. Visits_Attraction Table

```sql
INSERT INTO Visits_Attraction (TouristID, AttractionID, Days_of_Visit)
VALUES
  (1, 1, '2024-01-05 to 2024-01-06'),
  (2, 2, '2024-02-10 to 2024-02-11'),
  (3, 3, '2024-03-15 to 2024-03-16'),
  (4, 4, '2024-04-01 to 2024-04-02'),
  (5, 5, '2024-05-05 to 2024-05-06'),
  (6, 6, '2024-06-12 to 2024-06-13'),
  (7, 7, '2024-07-05 to 2024-07-06'),
```

```sql
    (8, 8, '2024-08-10 to 2024-08-11'),
    (9, 9, '2024-09-01 to 2024-09-02'),
    (10, 10, '2024-10-15 to 2024-10-16');




--9. Business_Impact Table

INSERT INTO Business_Impact (BusinessID, ImpactID, Revenue_Generated)
VALUES
    (1, 1, 15000.00),
    (2, 2, 25000.00),
    (3, 3, 18000.00),
    (4, 4, 22000.00),
    (5, 5, 30000.00),
    (6, 6, 27500.00),
    (7, 7, 20000.00),
    (8, 8, 32000.00),
    (9, 9, 29000.00),
    (10, 10, 15000.00);




--10. Economic_Metric Table

INSERT INTO Economic_Metric (Eco_ImpactID, MetricID, Eco_Metric_Timestamp)
VALUES
    (1, 1, '2024-01-10 12:00:00'),
    (2, 2, '2024-02-15 14:30:00'),
    (3, 3, '2024-03-20 10:00:00'),
    (4, 4, '2024-04-05 11:45:00'),
    (5, 5, '2024-05-08 16:15:00'),
    (6, 6, '2024-06-18 09:50:00'),
    (7, 7, '2024-07-10 13:20:00'),
    (8, 8, '2024-08-14 10:05:00'),
    (9, 9, '2024-09-05 17:30:00'),
    (10, 10, '2024-10-20 08:00:00');
```

```sql
--11. Environmental_Metric Table

INSERT INTO Environmental_Metric (Evt_ImpactID, MetricID, EVT_Metric_Timestamp)
VALUES
    (1, 1, '2024-01-15 09:15:00'),
    (2, 2, '2024-02-10 14:20:00'),
    (3, 3, '2024-03-12 11:45:00'),
    (4, 4, '2024-04-05 13:10:00'),
    (5, 5, '2024-05-18 12:00:00'),
    (6, 6, '2024-06-21 15:30:00'),
    (7, 7, '2024-07-08 10:45:00'),
    (8, 8, '2024-08-03 14:50:00'),
    (9, 9, '2024-09-15 08:20:00'),
    (10, 10, '2024-10-10 12:40:00');



(10, 10, '2024-01-10 17:00:00');



--12. Certificate_Metric Table
INSERT INTO Certificate_Metric (CertificateID, MetricID, Compliance_Rating)
VALUES
    (1, 1, 95.50),
    (2, 2, 90.75),
    (3, 3, 85.20),
    (4, 4, 88.10),
    (5, 5, 87.25),
    (6, 6, 92.50),
    (7, 7, 80.60),
    (8, 8, 78.40),
    (9, 9, 82.10),
    (10, 10, 89.00);




--13. Accommodation_Certification Table
INSERT INTO Accommodation_Certification (AccommodationID, CertificateID,
Certification_Grade)
VALUES
    (1, 1, 'A+'),
```

```
    (2, 2, 'A'),
    (3, 3, 'B+'),
    (4, 4, 'A-'),
    (5, 5, 'B'),
    (6, 6, 'A+'),
    (7, 7, 'B+'),
    (8, 8, 'B-'),
    (9, 9, 'A'),
    (10, 10, 'A');
```

DROP TABLE Statements:

```sql
-- Drop associative entity tables
DROP TABLE IF EXISTS Accommodation_Certification;
DROP TABLE IF EXISTS Certificate_Metric;
DROP TABLE IF EXISTS Environmental_Metric;
DROP TABLE IF EXISTS Economic_Metric;
DROP TABLE IF EXISTS Business_Impact;
DROP TABLE IF EXISTS Visits_Attraction;
DROP TABLE IF EXISTS Collaborates_With;
DROP TABLE IF EXISTS Partners_With;
DROP TABLE IF EXISTS Organizes;
DROP TABLE IF EXISTS Engages_With;
DROP TABLE IF EXISTS Uses;
DROP TABLE IF EXISTS Stays_At;
DROP TABLE IF EXISTS Visits;

-- Drop original tables
DROP TABLE IF EXISTS Carrying_Capacity_Alert;
DROP TABLE IF EXISTS Educational_Content;
DROP TABLE IF EXISTS Sustainability_Metric;
DROP TABLE IF EXISTS Visitor_Review;
DROP TABLE IF EXISTS Cultural_Heritage_Site;
DROP TABLE IF EXISTS Economic_Impact;
DROP TABLE IF EXISTS Environmental_Impact;
DROP TABLE IF EXISTS Sustainability_Certification;
```

```sql
DROP TABLE IF EXISTS Local_Business;
DROP TABLE IF EXISTS Transportation_Provider;
DROP TABLE IF EXISTS Attraction;
DROP TABLE IF EXISTS Tour_Operator;
DROP TABLE IF EXISTS Tourist;
DROP TABLE IF EXISTS Accommodation;
DROP TABLE IF EXISTS Destination;
```

—--END OF DOCUMENT—--