SDG NUMBER 6: CLEAN WATER AND SANITATION

1) **Specific Problem to Address:** Access to clean drinking water in rural areas.

Problem Definition:

In many rural areas, access to clean and safe drinking water remains a significant challenge. Inequities in access can arise due to factors such as geographic location, infrastructure quality, and socioeconomic status. Addressing this issue requires data-driven solutions to identify areas with inadequate water access and to allocate resources effectively.

PART II

2.1) ERD at the bottom of the page

2.2) SQL statements to create database schema include the following:

Creating Country Table

```
CREATE TABLE Country (
    Country_ID INT PRIMARY KEY AUTO_INCREMENT,
    Country_Name VARCHAR(100) NOT NULL,
    ISO3_Code CHAR(3) NOT NULL UNIQUE
);
```

Creating Year Table

```
CREATE TABLE Year (
    Year_ID INT PRIMARY KEY,
    Year INT NOT NULL
);
```

Creating Population Table

```
CREATE TABLE Population (
    Population_ID INT PRIMARY KEY AUTO_INCREMENT,
```

```
    Country_ID INT,
    Year_ID INT,
    School_Age_Population_Thousands INT,
    Percent_Urban DECIMAL(5, 2),
    Percent_Pre_Primary DECIMAL(5, 2),
    Percent_Primary DECIMAL(5, 2),
    Percent_Secondary DECIMAL(5, 2),
    FOREIGN KEY (Country_ID) REFERENCES Country(Country_ID),
    FOREIGN KEY (Year_ID) REFERENCES Year(Year_ID)
);
```

2.3 Sample Data Insertion

```
-- Insert into Country table
INSERT INTO Country (Country_Name, ISO3_Code) VALUES ('Kenya', 'KEN');

-- Insert into Year table
INSERT INTO Year (Year_ID, Year) VALUES (2000, 2000), (2001, 2001), (2002, 2002);

-- Insert into Population table
INSERT INTO Population (Country_ID, Year_ID, School_Age_Population_Thousands, Percent_Urban, Percent_Pre_Primary, Percent_Primary, Percent_Secondary)
VALUES (1, 2000, 12985, 20, 22, 41, 36),
    (1, 2001, 13254, 20, 23, 41, 37),
```

(1, 2002, 13545, 21, 23, 41, 37);

PART III

3.1) **Retrieve Areas with the Lowest Access to Basic Water Services**

```
SELECT c.Country_Name, y.Year, p.Percent_Basic_Water_Services
FROM Population p
JOIN Country c ON p.Country_ID = c.Country_ID
JOIN Year y ON p.Year_ID = y.Year_ID
WHERE y.Year = 2023
ORDER BY p.Percent_Basic_Water_Services ASC
LIMIT 10;  -- Adjust the LIMIT value to show more or fewer results
```

Compare Water Access Between Urban and Rural Areas

```
SELECT c.Country_Name, y.Year,
    p.Percent_Basic_Water_Services AS Percent_Basic_Water_Urban,
    p.Percent_Limited_Water_Services AS Percent_Limited_Water_Urban,
    p.Percent_No_Water_Service AS Percent_No_Water_Service_Urban
FROM Population p
JOIN Country c ON p.Country_ID = c.Country_ID
JOIN Year y ON p.Year_ID = y.Year_ID
WHERE c.Country_Name = 'Kenya' AND y.Year = 2023;
```

Identify Rural Areas with No Water Services

```
SELECT c.Country_Name, y.Year, p.Percent_No_Water_Service
FROM Population p
JOIN Country c ON p.Country_ID = c.Country_ID
JOIN Year y ON p.Year_ID = y.Year_ID
WHERE y.Year = 2023 AND p.Percent_No_Water_Service > 50
ORDER BY p.Percent_No_Water_Service DESC;
```

3.2) **Distribution of Hygiene Services Across Regions**

```
SELECT c.SDG_Region, AVG(p.Percent_Basic_Hygiene_Services) AS
Avg_Percent_Basic_Hygiene_Services
FROM Population p
JOIN Country c ON p.Country_ID = c.Country_ID
JOIN Year y ON p.Year_ID = y.Year_ID
WHERE y.Year = 2023
GROUP BY c.SDG_Region
ORDER BY Avg_Percent_Basic_Hygiene_Services DESC;
```

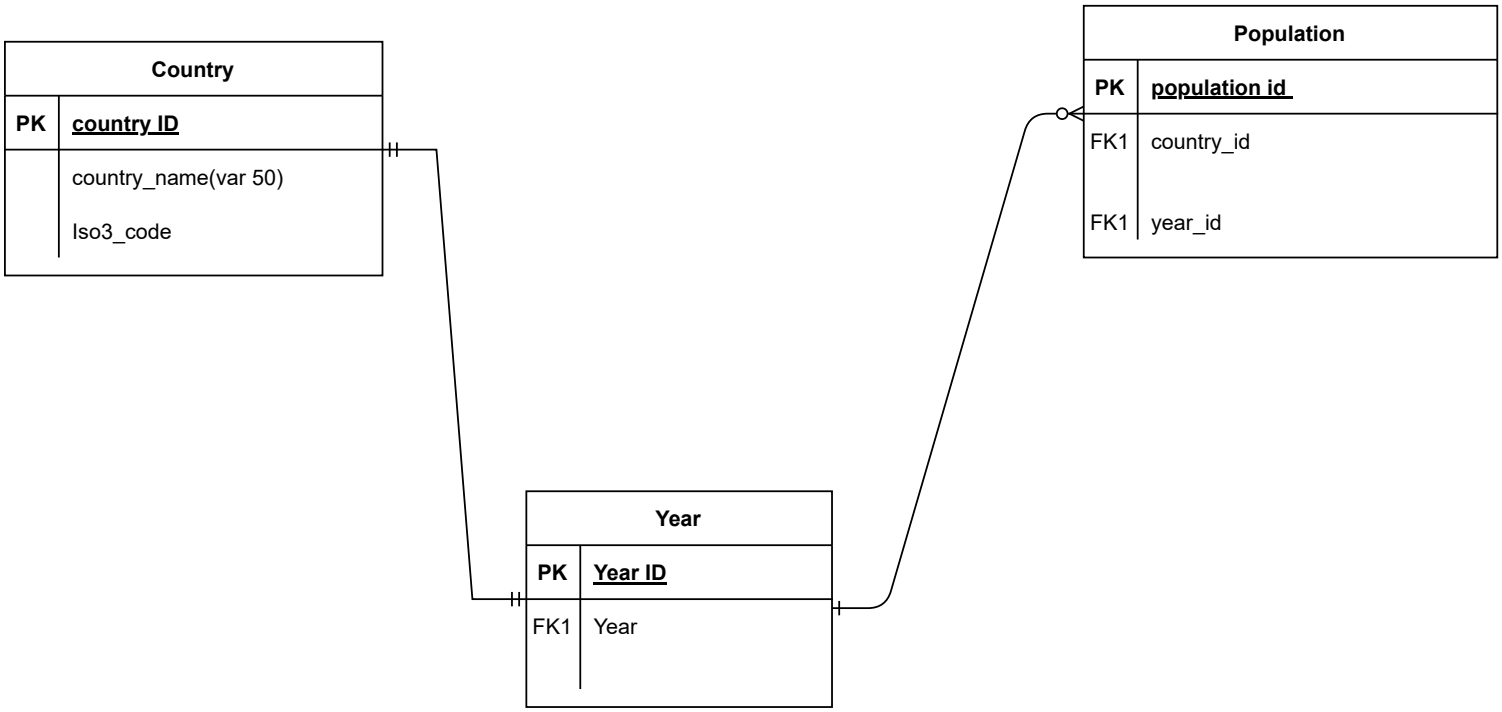
Water Access in Countries with High Rural Population

```
SELECT c.Country_Name,
    p.Percent_Basic_Water_Services_Rural AS Percent_Basic_Water_Rural,
    p.Percent_No_Water_Service_Rural AS Percent_No_Water_Service_Rural
FROM Population p
```

```
JOIN Country c ON p.Country_ID = c.Country_ID
JOIN Year y ON p.Year_ID = y.Year_ID
WHERE y.Year = 2023
ORDER BY p.Percent_Rural_Population DESC
LIMIT 10;  -- Show top 10 countries with high rural populations
```

Historical Overview of Water Access for a Specific Region

```
SELECT y.Year,
    AVG(p.Percent_Basic_Water_Services) AS Avg_Percent_Basic_Water_Services
FROM Population p
JOIN Country c ON p.Country_ID = c.Country_ID
JOIN Year y ON p.Year_ID = y.Year_ID
WHERE c.SDG_Region = 'Eastern and Southern Africa'
GROUP BY y.Year
ORDER BY y.Year;
```


Country
PK
country ID
country_name(var 50)
Iso3_code
Population
PK
population id
FK1
country_id
FK1
year_id
Year
PK
Year ID
FK1
Year