1. Create a **View** called **“forestation”** by joining all three tables - **forest\_area, land\_area** and **regions** in the workspace.
2. The **forest\_area** and **land\_area** tables *join* on both **country\_code** AND **year**.
3. The **regions** table joins these based on only **country\_code**.
4. In the ‘forestation’ View, include the following:
   * **All of the columns of the origin tables**
   * A **new column** that provides the **percent of the land area that is designated as forest**.
5. *Keep in mind* that the column **forest\_area\_sqkm** in the forest\_area table and the **land\_area\_sqmi** in the land\_area table are in **different units (square kilometers and square miles, respectively)**, so an adjustment will need to be made in the calculation you write (1 sq mi = 2.59 sq km).

## DROP view IF EXISTS forestation;CREATE view forestation AS   SELECT F.country\_code   AS CountryCode ,          F.country\_name   AS CountryName,          F.year           AS YEAR,          F.forest\_area\_sqkm,          (L.total\_area\_sq\_mi \* 2.59) AS TotalArea\_sqkm,          R.region,          R.income\_group ,          (F.forest\_area\_sqkm\*100) / (2.59\*L.total\_area\_sq\_mi) AS forest\_percent   FROM   forest\_area F   JOIN   land\_area L   ON     F.country\_code = L.country\_code   AND    F.year = L.year   JOIN   regions R   ON     R.country\_code = F.country\_code   AND    R.country\_code = L.country\_code = L.country\_code

## 1. GLOBAL SITUATION

a. What was the total forest area (in sq km) of the world in 1990? Please keep in mind that you can use the country record denoted as “World" in the region table.

SELECT year,  
       forest\_area\_sqkm,  
       region  
FROM   forestation  
WHERE  region = 'World'  
       AND year = '1990'

b. What was the total forest area (in sq km) of the world in 2016? Please keep in mind that you can use the country record in the table is denoted as “World.”

SELECT year,  
       forest\_area\_sqkm,  
       region  
FROM   forestation  
WHERE  region = 'World'  
       AND year = '2016'

c. What was the change (in sq km) in the forest area of the world from 1990 to 2016?  
WITH t1  
     AS (SELECT forest\_area\_sqkm AS fa1990  
         FROM   forestation  
         WHERE  region = 'World'  
                AND year = '1990'),  
     t2  
     AS (SELECT forest\_area\_sqkm AS fa2016  
         FROM   forestation  
         WHERE  region = 'World'  
                AND year = '2016')  
SELECT t1.fa1990 - t2.fa2016                                                AS  
       Drop\_sqkm,  
       **Round**(( ( t1.fa1990 - t2.fa2016 ) \* 100 / t1.fa1990 ) :: NUMERIC, 2) AS  
       Percent\_Drop\_sqkm  
FROM   t1,  
       t2

d. What was the percent change in forest area of the world between 1990 and 2016?

WITH t1  
     AS (SELECT forest\_area\_sqkm AS fa1990  
         FROM   forestation  
         WHERE  region = 'World'  
                AND year = '1990'),  
     t2  
     AS (SELECT forest\_area\_sqkm AS fa2016  
         FROM   forestation  
         WHERE  region = 'World'  
                AND year = '2016')  
SELECT t1.fa1990 - t2.fa2016                                                AS  
       Drop\_sqkm,  
       **Round**(( ( t1.fa1990 - t2.fa2016 ) \* 100 / t1.fa1990 ) :: NUMERIC, 2) AS  
       Percent\_Drop\_sqkm  
FROM   t1,  
       t2

e. If you compare the amount of forest area lost between 1990 and 2016, to which country's total area in 2016 is it closest to?

WITH t1  
AS  
  (  
         SELECT forest\_area\_sqkm AS fa1990  
         FROM   forestation  
         WHERE  region = 'World'  
         AND    year = '1990') ,  
  t2  
AS  
  (  
         SELECT forest\_area\_sqkm AS fa2016  
         FROM   forestation  
         WHERE  region = 'World'  
         AND    year = '2016')  
  SELECT   t1.fa1990 - t2.fa2016 AS drop\_sqkm ,  
           forestation.countryname ,  
           forestation.totalarea\_sqkm  
  FROM     t1,  
           t2 ,  
           forestation  
  WHERE    (  
                    t1.fa1990 - t2.fa2016) > forestation.totalarea\_sqkm  
  AND      year ='2016'  
  ORDER BY 3 DESC  
  LIMIT    1

**2. REGIONAL OUTLOOK**

a. What was the percent forest of the entire world in 2016? Which region had the HIGHEST percent forest in 2016, and which had the LOWEST, to 2 decimal places?

WITH forest\_1990  
AS  
  (  
           SELECT   region,  
                    round((sum(forest\_area\_sqkm)\*100/sum(totalarea\_sqkm) ):: NUMERIC ,2) AS forest\_percent\_1990  
           FROM     forestation  
           WHERE    year = '1990'  
           GROUP BY 1) ,  
  forest\_2016  
AS  
  (  
           SELECT   region,  
                    round((sum(forest\_area\_sqkm)\*100/sum(totalarea\_sqkm) ):: NUMERIC,2) AS forest\_percent\_2016  
           FROM     forestation  
           WHERE    year = '2016'  
           GROUP BY 1)  
  *--SELECT \**  
  *--FROM Forest\_2016*  
  *--WHERE region = 'World'*  
  *--SELECT \**  
  *--FROM Forest\_2016*  
  *--ORDER BY Forest\_Percent\_2016  DESC*  
  *--LIMIT 1*  
  SELECT   \*  
  FROM     forest\_2016  
  ORDER BY forest\_percent\_2016 ASC  
  LIMIT    1

b. What was the percent forest of the entire world in 1990? Which region had the HIGHEST percent forest in 1990, and which had the LOWEST, to 2 decimal places?

WITH forest\_1990  
AS  
  (  
           SELECT   region,  
                    round((sum(forest\_area\_sqkm)\*100/sum(totalarea\_sqkm) ):: NUMERIC ,2) AS forest\_percent\_1990  
           FROM     forestation  
           WHERE    year = '1990'  
           GROUP BY 1) ,  
  forest\_2016  
AS  
  (  
           SELECT   region,  
                    round((sum(forest\_area\_sqkm)\*100/sum(totalarea\_sqkm) ):: NUMERIC,2) AS forest\_percent\_2016  
           FROM     forestation  
           WHERE    year = '2016'  
           GROUP BY 1)  
  *--SELECT \**  
  *--FROM Forest\_1990*  
  *--WHERE region = 'World'*  
  *--SELECT \**  
  *--FROM Forest\_1990*  
  *--ORDER BY Forest\_Percent\_1990  DESC*  
  *--LIMIT 1*  
  SELECT   \*  
  FROM     forest\_1990  
  ORDER BY forest\_percent\_1990 ASC  
  LIMIT    1

c. Based on the table you created, which regions of the world DECREASED in forest area from 1990 to 2016?

WITH forest\_1990  
     AS (SELECT region,  
                **Round**(( **SUM**(forest\_area\_sqkm) \* 100 / **SUM**(totalarea\_sqkm) ) ::  
                      NUMERIC,  
                2) AS  
                Forest\_Percent\_1990  
         FROM   forestation  
         WHERE  year = '1990'  
         GROUP  BY 1),  
     forest\_2016  
     AS (SELECT region,  
                **Round**(( **SUM**(forest\_area\_sqkm) \* 100 / **SUM**(totalarea\_sqkm) ) ::  
                      NUMERIC,  
                2) AS  
                Forest\_Percent\_2016  
         FROM   forestation  
         WHERE  year = '2016'  
         GROUP  BY 1)  
SELECT forest\_2016.region,  
       forest\_2016.forest\_percent\_2016,  
       forest\_1990.forest\_percent\_1990  
FROM   forest\_1990  
       join forest\_2016  
         ON forest\_2016.region = forest\_1990.region

## 3. COUNTRY-LEVEL DETAIL

a. Which 5 countries saw the largest amount decrease in forest area from 1990 to 2016? What was the difference in forest area for each?

WITH forest1990 AS  
(  
       SELECT countryname,  
              region,  
              forest\_area\_sqkm  
       FROM   forestation  
       WHERE  year='1990') , forest2016 AS  
(  
       SELECT countryname,  
              region,  
              forest\_area\_sqkm  
       FROM   forestation  
       WHERE  year='2016')  
SELECT   forest1990.countryname,  
         forest1990.region,  
         *Round*(*Abs*(forest1990.forest\_area\_sqkm - forest2016.forest\_area\_sqkm )::numeric, 2)AS decrease\_sqkm  
FROM     forest1990  
JOIN     forest2016  
ON       forest1990.countryname = forest2016.countryname  
WHERE    forest1990.forest\_area\_sqkm - forest2016.forest\_area\_sqkm IS NOT NULL  
AND      forest1990.region !='World'  
ORDER BY forest1990.forest\_area\_sqkm - forest2016.forest\_area\_sqkm DESC limit 5

b. Which 5 countries saw the largest percent decrease in forest area from 1990 to 2016? What was the percent change to 2 decimal places for each?

WITH forest1990 AS  
(  
       SELECT countryname,  
              region,  
              forest\_area\_sqkm  
       FROM   forestation  
       WHERE  year='1990') , forest2016 AS  
(  
       SELECT countryname,  
              region,  
              forest\_area\_sqkm  
       FROM   forestation  
       WHERE  year='2016')  
SELECT   forest1990.countryname,  
         forest1990.region,  
         *Round*(*Abs*((forest1990.forest\_area\_sqkm - forest2016.forest\_area\_sqkm)\*100/(forest1990.forest\_area\_sqkm))::numeric, 2)AS percentdec\_sqkm  
FROM     forest1990  
JOIN     forest2016  
ON       forest1990.countryname = forest2016.countryname  
WHERE    forest1990.forest\_area\_sqkm - forest2016.forest\_area\_sqkm IS NOT NULL  
AND      forest1990.region !='World'  
ORDER BY (forest1990.forest\_area\_sqkm - forest2016.forest\_area\_sqkm)\*100/(forest1990.forest\_area\_sqkm) DESC limit 5

c. If countries were grouped by percent forestation in quartiles, which group had the most countries in it in 2016?

WITH ranges  
     AS (SELECT countrycode,  
                forest\_percent,  
                CASE  
                  WHEN forest\_percent < 25 THEN 'FIRST'  
                  WHEN forest\_percent < 50 THEN 'SECOND'  
                  WHEN forest\_percent < 75 THEN 'THIRD'  
                  WHEN forest\_percent < 100 THEN 'FOURTH'  
                END AS Quartiles  
         FROM   forestation  
         WHERE  year = '2016'  
                AND forest\_percent IS NOT NULL)  
SELECT *Count*(ranges.countrycode),  
       quartiles  
FROM   ranges  
GROUP  BY quartiles  
ORDER  BY count DESC

d. List all of the countries that were in the 4th quartile (percent forest > 75%) in 2016.

WITH ranges  
     AS (SELECT countryname,  
                region,  
                forest\_percent,  
                CASE  
                  WHEN forest\_percent < 25 THEN 'FIRST'  
                  WHEN forest\_percent < 50 THEN 'SECOND'  
                  WHEN forest\_percent < 75 THEN 'THIRD'  
                  WHEN forest\_percent < 100 THEN 'FOURTH'  
                END AS Quartiles  
         FROM   forestation  
         WHERE  year = '2016'  
                AND forest\_percent IS NOT NULL)  
SELECT ranges.countryname,  
       ranges.region,  
       **Round**(ranges.forest\_percent :: NUMERIC, 2) AS PC\_FOREST  
FROM   ranges  
WHERE  ranges.quartiles = 'FOURTH'  
ORDER  BY pc\_forest DESC

e. How many countries had a percent forestation higher than the United States in 2016?

WITH t1  
     AS (SELECT forest\_percent AS US  
         FROM   forestation  
         WHERE  year = '2016'  
                AND forest\_percent IS NOT NULL  
                AND countryname = 'United States')  
SELECT *Count*(forestation.countryname) AS CountriesMoreThanUS  
FROM   forestation,  
       t1  
WHERE  year = '2016'  
       AND forest\_percent IS NOT NULL  
       AND forestation.forest\_percent > t1.us