SQL Queries For Deforestation Exploration Project

***** CREATE A VIEW *****

```
CREATE VIEW forestation AS
    SELECT DISTINCT
            f.country_code AS country_code,
            f.country_name AS country_name,
            f.year AS year,
            f.forest_area_sqkm,
            (l.total_area_sq_mi * 2.59) AS total_area_sqkm,
            r.region,
            R.income_group,
            100 * (f.forest_area_sqkm / (l.total_area_sq_mi * 2.59))
        AS forest_percent_of_land
    FROM forest_area f
    JOIN land_area l
    ON f.country_code = l.country_code AND f.year = l.year
    JOIN regions r
    ON f.country_code = r.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 *
FROM forestation
WHERE year = 1990 AND country_name = 'World' ;
```

    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 *
```

```
FROM forestation
WHERE year = 2016 AND country_name = 'World' ;
```

c. What was the change (in sq km) in the forest area of the world from 1990 to 2016?

```
SELECT forest_area_sqkm -
        (SELECT forest_area_sqkm
         FROM forestation
         WHERE year = 2016 AND country_name = 'World')
  AS forest_area_change
FROM forestation
WHERE year = 1990 AND country_name = 'World' ;
```

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

```
SELECT  forest_area_sqkm,
         year,
        ((forest_area_sqkm -
        LEAD(forest_area_sqkm, 1) OVER(ORDER BY year)) /
        forest_area_sqkm) * 100
             AS percent_change_in_forest_area
FROM   (SELECT forest_area_sqkm, year, country_name
        FROM forestation
        WHERE year IN( '1990', '2016' )
             AND country_code = 'WLD'
       ) AS sub
```

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?

```
SELECT DISTINCT f.country_name,
                f.total_area_sqkm,
                ABS((f.total_area_sqkm -
                     (SELECT forest_area_sqkm -
                          (SELECT forest_area_sqkm
                           FROM forestation
```

```
                    WHERE year = 2016 AND
                          country_name = 'World')
                      AS forest_area_change
                FROM forestation
                WHERE year = 1990 AND country_name =
                      'World'
                )
               ))
          AS forest_area_change_to_closest_country
               -- the amount of forest area lost between
          1990 and 2016, to which country's total area in
          2016 is it closest to
FROM forestation f
ORDER BY forest_area_change_to_closest_country
LIMIT 1;
```

2. Regional Outlook

/***** Create a table that shows the Regions and their percent forest area (sum of forest area divided by sum of land area) in 1990 and 2016. (Note that 1 sq mi = 2.59 sq km). *****/

```
CREATE VIEW regional_outlook AS

    SELECT region, year, ROUND( CAST( 100 *

            (SUM( forest_area_sqkm) / SUM(total_area_sq_mi * 2.59)) AS
          NUMERIC),2) AS total_forest_percent

    FROM forestation

    WHERE year IN(1990, 2016)

    GROUP BY region, year

    ORDER BY total_forest_percent;
```

a. What was the percent forest of the entire world in 2016?

```
SELECT total_forest_percent
FROM regional_outlook
WHERE year = 2016 AND region = 'World';
```

Which region had the HIGHEST percent forest in 2016, and which had the LOWEST, to 2 decimal places?

```
-- Highest
SELECT *
FROM regional_outlook
WHERE year = 2016 AND region != 'World'
ORDER BY total_forest_percent DESC
LIMIT 1;

-- Lowest
SELECT *
FROM regional_outlook
WHERE year = 2016 AND region != 'World'
ORDER BY total_forest_percent
LIMIT 1;
```

b. What was the percent forest of the entire world in 1990?

```
SELECT total_forest_percent
FROM regional_outlook
WHERE year = 1990 AND region = 'World';
```

Which region had the HIGHEST percent forest in 1990, and which had the LOWEST, to 2 decimal places?

```
-- Highest
SELECT *
FROM regional_outlook
WHERE year = 1990 AND region != 'World'
ORDER BY total_forest_percent DESC
LIMIT 1;

-- Lowest
SELECT *
FROM regional_outlook
WHERE year = 1990 AND region != 'World'
ORDER BY total_forest_percent
LIMIT 1;
```

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

```
SELECT sub.region, sub.year, sub.forest_change,
                CASE WHEN sub.forest_change > 0
                    THEN 'Increased'
                    ELSE 'Decreased'
                    END
                AS forest_increased_or_decreased
```

```
FROM ( SELECT region, year,  total_forest_percent,
            (total_forest_percent - (   LEAD (total_forest_percent,1)
            OVER (PARTITION BY region ORDER BY year DESC)))
            AS forest_change
          FROM regional_outlook
          WHERE year = 1990 OR year = 2016
        ) AS sub
WHERE year = 2016
```

```
/****** To complete Table 2.1  ******/
```

```
SELECT region, year,  total_forest_percent,
       (total_forest_percent - (LEAD (total_forest_percent,1) OVER
       (PARTITION BY region ORDER BY year DESC)))
       AS forest_change
FROM regional_outlook
WHERE year = 1990 OR year = 2016
```

3. Country-Level Detail

```
/****  VIEW for  COUNTRY-LEVEL Details *****/
```

```
CREATE VIEW country_level_detail AS

      SELECT DISTINCT

            ft1.country_name,

            ft1.region,

            ft1.forest_area_sqkm AS forest_area_sqkm_2016,

            ft2.forest_area_sqkm AS forest_area_sqkm_1990,

            (ft1.forest_area_sqkm - ft2.forest_area_sqkm) AS

                  Forest_area_sqkm_change_2016_vs_1990,

            ROUND(100* CAST(((ft1.forest_area_sqkm -
                  ft2.forest_area_sqkm)/ft2.forest_area_sqkm) AS
                  NUMERIC),2) AS forest_percent_1990_vs_2016
```

```
FROM forestation ft1,
        forestation ft2
WHERE (ft1.year = '2016' AND ft2.year = '1990')
AND (ft1.country_code = ft2.country_code);
```

/**** Top two countries which increased its forest area the most *****/

```
SELECT *
FROM country_level_detail
WHERE country_name != 'World' AND
                (forest_area_sqkm_change_2016_vs_1990 > 0)
ORDER BY forest_area_sqkm_ bchange_2016_vs_1990 DESC
LIMIT 2;
```

/**** The country that has the largest percent change in forest area from 1990 to 2016 *****/

```
SELECT *
FROM country_level_detail
WHERE country_name != 'World'
        AND (forest_percent_1990_vs_2016 > 0)
ORDER BY forest_percent_1990_vs_2016 DESC
LIMIT 1;
```

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?

```
SELECT country_name,
        region,
        forest_area_sqkm_change_2016_vs_1990
FROM country_level_detail
WHERE country_name != 'World' AND
    forest_area_sqkm_change_2016_vs_1990 IS NOT NULL
ORDER BY forest_area_sqkm_change_2016_vs_1990
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?

```
SELECT country_name,
        region,
        ROUND(forest_percent_1990_vs_2016,2)
FROM country_level_detail
WHERE country_name != 'World'
    AND forest_percent_1990_vs_2016 IS NOT NULL
ORDER BY forest_percent_1990_vs_2016
LIMIT 5;
```

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

```
SELECT COUNT(country_name),
```

```
        CASE WHEN forest_percent_of_land <= 25
                THEN 'FIRST'
                WHEN (forest_percent_of_land BETWEEN 25 AND 50)
                THEN 'SECOND'
                WHEN (forest_percent_of_land BETWEEN 50 AND 75)
                THEN 'THIRD'
                WHEN forest_percent_of_land > 75
                THEN 'FOURTH'
                END
        AS forest_percent_quartile
    FROM forestation
    WHERE country_name != 'World' AND year = 2016 AND
        forest_percent_of_land IS NOT NULL
    GROUP BY forest_percent_quartile
```

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

```
    SELECT country_name, region,
            ROUND(CAST(forest_percent_of_land AS NUMERIC),2) AS
                forest_percent
    FROM forestation
    WHERE country_name != 'World'
            AND year = 2016
            AND forest_percent_of_land > 75
    ORDER BY forest_percent_of_land DESC
```

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

```
WITH T1 AS (SELECT forest_percent_of_land
            FROM forestation
            WHERE country_name LIKE 'United States'
                AND year = 2016)

SELECT COUNT(country_name)
FROM T1, forestation AS f
WHERE f.forest_percent_of_land > T1.forest_percent_of_land
    AND f.year = 2016
```