SQL Queries Used

1. PROJECT PART 1

Create a View called forestation" by joining all three tables - forest_area, land_area and regions in the workspace.

The forest_area and land_area tables *join* on both country_code AND year.

The regions table joins these based on only country_code.

```
DROP VIEW IF EXISTS forestation;

CREATE VIEW forestation AS
                    (SELECT f.country_code AS country_code,
                    f.country_name AS country_name,
                    f.year AS years,
                    f.forest_area_sqkm AS forest_area,
                    l.total_area_sq_mi AS total_area,
                    (l.total_area_sq_mi * 2.59) as total_area_mikm,
                    r.region AS region,
                    r.income_group AS income,
                    ROUND(((f.forest_area_sqkm/(l.total_area_sq_mi*2.59))*100)::numeric,2)
                        AS forest_percentage
                        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 = l.country_code);

 SELECT * FROM forestation;
```

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 forest_area, years, country_name
  FROM forestation
 WHERE country_name = 'World' AND years = 1990;
```

ANSWER :

forest_area	Years	country_name
41282694.9	1990	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 forest_area, years, country_name
  FROM forestation
 WHERE country_name = 'World' AND years = 2016;
```

ANSWER :

Forest_area	years	country_name
39958245.9	2016	World

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

AND

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

```
WITH years_1990 AS
        (SELECT  forest_area AS farea_1990, years, country_name
        FROM forestation
        WHERE country_name = 'World' AND years = 1990),
        years_2016 AS
                (SELECT forest_area AS farea_2016, years, country_name
        FROM forestation
        WHERE country_name = 'World' AND years = 2016)

SELECT (years_1990.farea_1990 - years_2016.farea_2016) AS area_change,
         ROUND(((years_1990.farea_1990 - years_2016.farea_2016) / years_1990.farea_1990 * 100) ::
numeric, 2) AS forest_per_change
  FROM years_1990
   JOIN years_2016
     ON years_1990.country_name = years_2016.country_name;
```

ANSWER :

area_change	forest_per_change
1324449	3.21

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 *
  FROM forestation
 WHERE years = '2016' AND total_area_mikm <= 1324449
 ORDER BY total_area DESC
        LIMIT 1;
```

ANSWER :

country_name	years	total_area_mikm	forest_percentage
Peru	2016	1279999.9891	57.66

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?

***** The percent forest of the entire world in 2016 *****

```
SELECT ROUND((sum(forest_area)/sum(total_area_mikm)*100)::numeric,2) AS entire_world
  FROM forestation
 WHERE years = 2016;
```

ANSWER :

entire_world
31.34

***** Which region had the HIGHEST percent forest in 2016 *****

```
SELECT region, ROUND((sum(forest_area)/sum(total_area_mikm)*100)::numeric,2) AS tot_per
  FROM forestation
 WHERE years = 2016
 GROUP BY 1
 ORDER BY tot_per DESC
        LIMIT 1;
```

ANSWER :

region	tot_per
Latin America & Caribbean	46.16

***** Which region had the LOWEST percent forest in 2016 *****

```
SELECT region, ROUND((sum(forest_area)/sum(total_area_mikm)*100)::numeric,2) AS tot_per
  FROM forestation
 WHERE years = 2016
 GROUP BY 1
 ORDER BY tot_per
        LIMIT 1;
```

ANSWER :

region	tot_per
Middle East & North Africa	2.07

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?

***** The percent forest of the entire world in 1990 *****

```
SELECT ROUND((sum(forest_area)/sum(total_area_mikm)*100)::numeric,2) AS entire_world
  FROM forestation
 WHERE years = 1990;
```

ANSWER :

entire_world
32.21

```
            ***** Which region had the HIGHEST percent forest in 1990 *****
SELECT region, ROUND((sum(forest_area)/sum(total_area_mikm)*100)::numeric,2) AS tot_per
  FROM forestation
 WHERE years = 1990
 GROUP BY 1
 ORDER BY tot_per DESC
    LIMIT 1;
```

ANSWER:

region	tot_per
Latin America & Caribbean	51.03

```
            ***** Which region had the LOWEST percent forest in 1990 *****
SELECT region, ROUND((sum(forest_area)/sum(total_area_mikm)*100)::numeric,2) AS tot_per
  FROM forestation
 WHERE years = 1990
 GROUP BY 1
 ORDER BY tot_per
         LIMIT 1;
```

ANSWER :

region	tot_per
Middle East & North Africa	1.78

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

```
WITH years_1990 AS
                (SELECT ROUND((sum(forest_area)*100/sum(total_area_mikm))::NUMERIC, 2) AS
farea_1990,
                        region
                  FROM forestation
                 WHERE years = 1990
                 GROUP BY region, years
```

```
                    ORDER BY farea_1990 DESC),
        years_2016 AS
                (SELECT ROUND((sum(forest_area)*100/sum(total_area_mikm))::NUMERIC,2) AS
farea_2016,
                                region
                    FROM forestation
                   WHERE years = 2016 AND forest_area IS NOT NULL
                   GROUP BY region, years)
                --  ORDER BY farea_2016)

SELECT years_1990.region, years_1990.farea_1990, years_2016.farea_2016,
        (years_1990.farea_1990 - years_2016.farea_2016) AS forest_per_change
  FROM years_1990
    JOIN years_2016
      ON years_1990.region = years_2016.region
 GROUP BY 1, years_1990.farea_1990, years_2016.farea_2016
 ORDER BY forest_per_change DESC;
```

Answer :

region	farea_1990	farea_2016	forest_per_change
Latin America & Caribbean	51.03	46.16	4.87
Sub-Saharan Africa	30.67	28.79	1.88
World	32.42	31.38	1.04
Middle East & North Africa	1.78	2.07	-0.29
North America	35.65	36.04	-0.39
East Asia & Pacific	25.78	26.36	-0.58
Europe & Central Asia	37.28	38.06	-0.78
South Asia	16.51	17.51	-1.00

3. COUNTRY-LEVEL DETAIL

```
WITH t1 as
                ( SELECT country_name, region, forest_area forest_area1
                FROM forestation
                WHERE years = '1990' AND forest_area IS NOT NULL AND country_name NOT LIKE
'World'
                ORDER BY country_name),
        t2 as
        (SELECT country_name, region, forest_area forest_area2
                FROM forestation
        WHERE years = '2016' AND forest_area IS NOT NULL AND country_name NOT LIKE 'World'
```

```
        ORDER BY country_name)

SELECT t1.country_name, t1.region, t1.forest_area1, t2.forest_area2, (t2.forest_area2 - t1.forest_area1)
as difference
  FROM t1
        JOIN t2
        ON t1.country_name = t2.country_name
 ORDER BY difference DESC
        LIMIT 5;
```

Success Story:

country_name	region	difference
China	East Asia & Pacific	527229.062
United States	North America	79200
India	South Asia	69213.9844
Russian Federation	Europe & Central Asia	59395
Vietnam	East Asia & Pacific	55390

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 year_1990 AS
        (SELECT country_name, region, sum(forest_area) AS country_forest_area_1990
                FROM forestation
            WHERE country_name NOT LIKE 'World' AND years = 1990 AND forest_area IS NOT
NULL
                GROUP BY country_name, region),
    year_2016 AS
            (SELECT country_name, region, sum(forest_area) AS country_forest_area_2016
                FROM forestation
            WHERE country_name NOT LIKE 'World' AND years = 2016 AND forest_area IS NOT
NULL
                GROUP BY country_name, region)

 SELECT year_1990.country_name, year_1990.region ,
        ROUND((country_forest_area_1990 - country_forest_area_2016)::numeric, 2) AS difference
   FROM year_1990
        JOIN year_2016
        ON year_1990.country_name = year_2016.country_name
 ORDER BY difference desc
 LIMIT 5;
```

ANSWER :

country_name	region	difference
Brazil	Latin America & Caribbean	541510.00
Indonesia	East Asia & Pacific	282193.98
Myanmar	East Asia & Pacific	107234.00
Nigeria	Sub-Saharan Africa	106506.00
Tanzania	Sub-Saharan Africa	102320.00

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 year_1990 AS
                (SELECT country_name, region, sum(forest_area) AS country_forest_area_1990
                        FROM forestation
                WHERE country_name NOT LIKE 'World' AND years = 1990 AND forest_area IS NOT
NULL
                        GROUP BY country_name, region),
        year_2016 AS
                        (SELECT country_name, region, sum(forest_area) AS country_forest_area_2016
                        FROM forestation
                WHERE country_name NOT LIKE 'World' AND years = 2016 AND forest_area IS NOT
NULL
                        GROUP BY country_name, region)

SELECT year_1990.country_name, year_1990.region ,
        ROUND(((country_forest_area_1990 -
country_forest_area_2016)*100/country_forest_area_1990)::numeric,2) AS difference
  FROM year_1990
    JOIN year_2016
        ON year_2016.country_name = year_1990.country_name
 ORDER BY difference DESC
         LIMIT 5;
```

ANSWER :

country_name	region	difference
Togo	Sub-Saharan Africa	75.45
Nigeria	Sub-Saharan Africa	61.80
Uganda	Sub-Saharan Africa	59.13
Mauritania	Sub-Saharan Africa	46.75

Honduras	Latin America & Caribbean	45.03

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

```
WITH quartile AS
                (SELECT country_name, region, forest_percentage,
                CASE
                                WHEN forest_percentage <= 25 THEN '1st Quartile'
                                WHEN forest_percentage > 25 AND forest_percentage <= 50 THEN '2nd
Quartile'
                                 WHEN forest_percentage > 50 AND forest_percentage <= 75 THEN '3rd
Quartile'
                          ELSE '4th Quartile'
                         END AS quartiles
                FROM forestation
                WHERE country_name NOT LIKE 'World' AND forest_percentage IS NOT NULL AND
years = 2016
                ORDER BY 3 DESC)

SELECT quartiles AS QUARTILES, COUNT(*) AS Number_of_cuntries
  FROM quartile
 GROUP BY 1
 ORDER BY 1;
```

ANSWER :

quartiles	number_of_cuntries
1st Quartile	85
2nd Quartile	72
3rd Quartile	38
4th Quartile	9

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

```
SELECT country_name, forest_percentage
  FROM forestation
 WHERE forest_percentage >= 75 AND years = 2016
 ORDER BY forest_percentage DESC;
```

ANSWER :

country_name	egion	orest_percentage
Suriname	Latin America & Caribbean	98.26
Micronesia, Fed. Sts.	East Asia & Pacific	91.86
Gabon	Sub-Saharan Africa	90.04
Seychelles	Sub-Saharan Africa	88.41
Palau	East Asia & Pacific	87.61
American Samoa	East Asia & Pacific	87.50
Guyana	Latin America & Caribbean	83.90
Lao PDR	East Asia & Pacific	82.11
Solomon Islands	East Asia & Pacific	77.86

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

```
SELECT COUNT(country_name), forest_percentage
  FROM forestation
 WHERE years = 2016 AND forest_percentage >
                                              (SELECT forest_percentage
                                            FROM forestation
                                            WHERE country_name LIKE 'United States' AND years
= 2016)
 ORDER BY 2;
```