Report for ForestQuery into Global Deforestation, 1990 to 2016

ForestQuery is on a mission to combat deforestation around the world and to raise awareness about this topic and its impact on the environment. The data analysis team at ForestQuery has obtained data from the World Bank that includes forest area and total land area by country and year from 1990 to 2016, as well as a table of countries and the regions to which they belong.

The data analysis team has used SQL to bring these tables together and to query them in an effort to find areas of concern as well as areas that present an opportunity to learn from successes.

1. GLOBAL SITUATION

According to the World Bank, the total forest area of the world was **41,282,694.9 km^2** in 1990. As of 2016, the most recent year for which data was available, that number had fallen to **39,958,245.9 km^2**, a loss of **1,324,449 km^2**, or **3.21** %.

The forest area lost over this time period is slightly more than the entire land area of Peru listed for the year 2016 (which is **1,279,999.98 km^2**).

2. REGIONAL OUTLOOK

In 2016, the percent of the total land area of the world designated as forest was **31.38**. The region with the highest relative forestation was **Latin America & Caribbean**, with **46.16 %,** and the region with the lowest relative forestation was **Middle East & North Africa**, with **2.07%** forestation.

In 1990, the percent of the total land area of the world designated as forest was **32.42**. The region with the highest relative forestation was **Latin America & Caribbean**, with **51.03%,** and the region with the lowest relative forestation was **Middle East & North Africa**, with **1.78%** forestation.

Table 2.1: Percent Forest Area by Region, 1990 & 2016:

Region	1990 Forest Percentage	2016 Forest Percentage
Middle East & North Africa	1.78	2.07
South Asia	16.51	17.51
East Asia & Pacific	25.78	26.36
Sub-Saharan Africa	30.67	28.79
World	32.42	31.38
North America	35.65	36.04
Europe & Central Asia	37.28	38.04
Latin America & Caribbean	51.03	46.16

The only regions of the world that decreased in percent forest area from 1990 to 2016 were **Sub-Saharan Africa** (dropped from **30.67%** to **28.79%**) and **Latin America & Caribbean** (**51.03%** to **46.16%**). All other regions actually increased in forest area over this time period. However, the drop in forest area in the two aforementioned regions was so large, the percent forest area of the world decreased over this time period from **32.42%** to **31.38%.**

3. COUNTRY-LEVEL DETAIL

A. SUCCESS STORIES

There is one particularly bright spot in the data at the country level, **China**. This country actually increased in forest area from 1990 to 2016 by **527,229.062 km^2**. It would be interesting to study what has changed in this country over this time to drive this figure in the data higher. The country with the next largest increase in forest area from 1990 to 2016 was the **United States**, but it only saw an increase of **79,200 km^2,** much lower than the figure for **China**.

China and the **United States** are of course very large countries in total land area, so when we look at the largest *percent* change in forest area from 1990 to 2016, we aren't surprised to find a much smaller country listed at the top. **Iceland** increased in forest area by **213.66%** from 1990 to 2016.

B. LARGEST CONCERNS

Which countries are seeing deforestation to the largest degree? We can answer this question in two ways. First, we can look at the absolute square kilometer decrease in forest area from 1990 to 2016. The following 5 countries had the largest decrease in forest area over the time period under consideration:

Table 3.1: Top 5 Amount Decrease in Forest Area by Country, 1990 & 2016:

Country	Region	Absolute Forest Area Change
Brazil	Latin America & Caribbean	541510
Indonesia	East Asia & Pacific	282193.9844
Myanmar	East Asia & Pacific	107234.0039
Nigeria	Sub-Saharan Africa	106506.00098
Tanzania	Sub-Saharan Africa	102320

The second way to consider which countries are of concern is to analyze the data by percent decrease.

Table 3.2: Top 5 Percent Decrease in Forest Area by Country, 1990 & 2016:

Country	Region	Pct Forest Area Change
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

When we consider countries that decreased in forest area the most between 1990 and 2016, we find that four of the top 5 countries on the list are in the region of **Sub-Saharan Africa**. The countries are **Togo, Nigera, Uganda and Mauritania**. The 5th country on the list is **Honduras**, which is in the **Latin America & Caribbean** region.

From the above analysis, we see that **Nigeria** is the only country that ranks in the top 5 both in terms of absolute square kilometer decrease in forest as well as percent decrease in forest area from 1990 to 2016. Therefore, this country has a significant opportunity ahead to stop the decline and hopefully spearhead remedial efforts.

C. QUARTILES

Table 3.3: Count of Countries Grouped by Forestation Percent Quartiles, 2016:

Quartile	Number of Countries
0-25%	85
25-50%	73
50-75%	38
75-100%	9

The largest number of countries in 2016 was found in the **1st or 0-25%** quartile.

There were **nine (9)** countries in the top quartile in 2016. These are countries with a very high percentage of their land area designated as forest. The following is a list of countries and their respective forest land, denoted as a percentage.

Table 3.4: Top Quartile Countries, 2016:

Country	Region	Pct Designated as Forest
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

There are 94 countries with percent forestation higher than the US in 2016.

4. RECOMMENDATIONS

Write out a set of recommendations as an analyst on the ForestQuery team.

- *What have you learned from the World Bank data?*

After conducting the analysis on deforestation based on the available data, the figures have shown how serious and how big the impact of deforestation is on a global scale.

It is good to learn that while some countries are losing their forest areas, there are some countries who are actually gaining which could be through reforestation. China has the largest increase in terms of forest area which is 527,229 km^2, the other top countries are the United States, India, Russian Federation and Vietnam although their increase in forest area are ten times smaller than China which are between 55,000 – 79,000 km^2.

But then, around the world, 1,324,449 km^2 of forest area were lost from 1990 to 2016. This area is almost as big as the size of the total land area of Peru. Among the top 5 countries that contributed to this deforestation area are Brazil which has the largest decrease of 541,510 km^2, Indonesia has 282,193 km^2, Myanmar has 107,234 km^2, Nigeria has 106,506 km^2 and Tanzania with 102,320 km2. The decrease in forest area are much higher than the increase and for this reason, the world has lost that much of forest area.

If this trend continues, this will be very alarming as deforestation has many consequences that badly affect our lives and our planet in the long term.

- *Which countries should we focus on over others?*

Based on the data, we should focus more on the top 5 countries which has the largest decrease in terms of forest area especially Brazil, which has the highest deforestation. We should also take into account those countries with highest percentage of decrease.

It is high time to push these countries and stop illegal deforestation.

5. APPENDIX: SQL QUERIES

Create View

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

```
CREATE VIEW forestation AS
      SELECT fa.country_code,
             fa.country_name,
             fa.year,
             fa.forest_area_sqkm,
             la.total_area_sq_mi,
             (la.total_area_sq_mi * 2.59) total_area_sqkm,
             r.region,
             r.income_group,
             ROUND(CAST(fa.forest_area_sqkm / (la.total_area_sq_mi * 2.59) * 100 AS
numeric), 2) forest_to_land_percentage
     FROM forest_area fa
     JOIN land_area la
     ON fa.country_code = la.country_code
     AND fa.year = la.year
     JOIN regions r ON r.country_code = la.country_code;
```

PART 1 - GLOBAL SITUATION

Question 1A

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.

Question 1B

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 country_name country,
      forest_area_sqkm total_forest_area_sqkm,
      year
FROM forestation
WHERE region = 'World'
AND (year = 1990 OR year = 2016);
```

country	total_forest_area_sqkm	year
World	39958245.9	2016
World	41282694.9	1990

Question 1C

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

Question 1D

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

```
WITH fa_1990 AS (
  SELECT country_name AS country, forest_area_sqkm AS total_forest_area_sqkm
  FROM forestation
  WHERE country_name = 'World' AND year = 1990
),

fa_2016 AS (
  SELECT country_name AS country, forest_area_sqkm AS total_forest_area_sqkm
  FROM forestation
  WHERE country_name = 'World' AND year = 2016
)

SELECT fa_1990.country,
      fa_1990.total_forest_area_sqkm AS forest_area_sqkm_1990,
      fa_2016.total_forest_area_sqkm AS forest_area_sqkm_2016,
      (fa_1990.total_forest_area_sqkm - fa_2016.total_forest_area_sqkm) AS
world_deforestation_sqkm,
      ROUND(CAST((fa_1990.total_forest_area_sqkm - fa_2016.total_forest_area_sqkm) /
fa_1990.total_forest_area_sqkm * 100 AS numeric), 2) AS world_deforestation_percentage
FROM fa_1990
JOIN fa_2016
ON fa_1990.country = fa_2016.country;
```

country	forest_area_sqkm_1990	forest_area_sqkm_2016	world_deforestation_sqkm	world_deforestation_percentage
World	41282694.9	39958245.9	1324449	3.21

Question 1E

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 country_name, total_area_sqkm
FROM forestation
WHERE year = 2016
AND country_name != 'World'
AND total_area_sqkm <= (
                            SELECT (world_fa_1990.forest_area_sqkm -
world_fa_2016.forest_area_sqkm) AS world_deforestation_sqkm
                            FROM (SELECT country_name, forest_area_sqkm
                                  FROM forestation
                                  WHERE country_name = 'World' AND year = 1990)
world_fa_1990
                            JOIN (SELECT country_name, forest_area_sqkm
                                         FROM forestation
                                         WHERE country_name = 'World' AND year = 2016)
world_fa_2016
                            ON world_fa_1990.country_name = world_fa_2016.country_name)
ORDER BY 2 DESC
LIMIT 1;
```

country_name	total_area_sqkm
Peru	1279999.9891

PART 2. REGIONAL OUTLOOK

Create Table

Instruction: 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).

```
SELECT a.region,
      ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric), 2)
forest_percentage_1990,
      ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric), 2)
forest_percentage_2016
FROM forestation a
JOIN forestation b
ON a.region=b.region
WHERE b.year=2016 AND a.year=1990
GROUP BY 1, a.year
ORDER BY 2;
```

region	forest_percentage_1990	forest_percentage_2016
Middle East & North Africa	1.78	2.07
South Asia	16.51	17.51
East Asia & Pacific	25.78	26.36
Sub-Saharan Africa	30.67	28.79
World	32.42	31.38
North America	35.65	36.04
Europe & Central Asia	37.28	38.04
Latin America & Caribbean	51.03	46.16

Question 2A

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?

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_2016
FROM source_table
WHERE region = 'World';
```

region	forest_percentage_2016
World	31.38

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_2016
FROM source_table
ORDER BY 2 DESC
LIMIT 1;
```

region	forest_percentage_2016
Latin America & Caribbean	46.16

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_2016
FROM source_table
ORDER BY 2
LIMIT 1;
```

region	forest_percentage_2016
Middle East & North Africa	2.07

Question 2B:

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?

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_1990
FROM source_table
WHERE region = 'World';
```

region	forest_percentage_1990
World	32.42

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_1990
FROM source_table
ORDER BY 2 DESC
LIMIT 1;
```

region	forest_percentage_1990
Latin America & Caribbean	51.03

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_1990
FROM source_table
ORDER BY 2
LIMIT 1;
```

region	forest_percentage_1990
Middle East & North Africa	1.78

Question 2C

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

```
WITH source_table AS (
  SELECT a.region,
        ROUND(CAST((SUM(a.forest_area_sqkm) / SUM(a.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_1990,
        ROUND(CAST((SUM(b.forest_area_sqkm) / SUM(b.total_area_sqkm) * 100) AS numeric),
2) forest_percentage_2016
  FROM forestation a
  JOIN forestation b
  ON a.region=b.region
  WHERE b.year=2016 AND a.year=1990
  GROUP BY 1, a.year
)

SELECT region, forest_percentage_1990, forest_percentage_2016, (forest_percentage_1990 -
forest_percentage_2016) AS deforestation_percentage
FROM source_table
WHERE (forest_percentage_1990 - forest_percentage_2016) > 0;
```

region	forest_percentage_1990	forest_percentage_2016	deforestation_percentage
Sub-Saharan Africa	30.67	28.79	1.88
Latin America & Caribbean	51.03	46.16	4.87
World	32.42	31.38	1.04

PART 3. COUNTRY-LEVEL DETAIL

A. Success Stories

List of top 5 countries with increase in forest area from 1990 to 2016

```
WITH source_table AS (SELECT a.country_name,
                             a.region,
                             CASE WHEN a.year = 1990 THEN SUM(a.forest_area_sqkm) END AS
forest_area_1990,
                             CASE WHEN b.year = 2016 THEN SUM(b.forest_area_sqkm) END AS
forest_area_2016
                             FROM forestation a
                             JOIN forestation b
                             ON a.country_name = b.country_name
                             WHERE b.year = 2016 AND a.year = 1990
                             GROUP BY 1, 2, a.year, b.year)
SELECT country_name,
                region,
        (forest_area_2016 - forest_area_1990) AS increase_forest_area
FROM source_table
WHERE country_name != 'World'
AND forest_area_1990 IS NOT NULL
AND forest_area_2016 IS NOT NULL
ORDER BY 3 DESC
LIMIT 5;
```

country_name	region	increase_forest_area
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

List of top 5 countries with increase in forest area from 1990 to 2016 in terms of percentage

```
WITH source_table AS (SELECT a.country_name,
                             a.region,
                             CASE WHEN a.year = 1990 THEN SUM(a.forest_area_sqkm) END AS
forest_area_1990,
                             CASE WHEN b.year = 2016 THEN SUM(b.forest_area_sqkm) END AS
forest_area_2016
                             FROM forestation a
                             JOIN forestation b
                             ON a.country_name = b.country_name
                             WHERE b.year = 2016 AND a.year = 1990
                             GROUP BY 1, 2, a.year, b.year)
SELECT country_name,
        region,
        ROUND(CAST((forest_area_2016 - forest_area_1990) / forest_area_1990 * 100 AS
numeric), 2) AS pct_forest_area_increase
FROM source_table
WHERE country_name != 'World'
AND forest_area_1990 IS NOT NULL
AND forest_area_2016 IS NOT NULL
ORDER BY 3 DESC
LIMIT 5;
```

country_name	region	pct_forest_area_increase
Iceland	Europe & Central Asia	213.66
French Polynesia	East Asia & Pacific	181.82
Bahrain	Middle East & North Africa	177.27
Uruguay	Latin America & Caribbean	134.11
Dominican Republic	Latin America & Caribbean	82.46

List of top 5 countries with largest total land area in 1990 and 2016

```
WITH land_area_table AS (SELECT a.country_name,
                                a.region,
                                CASE WHEN a.year = 1990 THEN SUM(a.total_area_sqkm) END
AS land_area_1990,
                                CASE WHEN b.year = 2016 THEN SUM(b.total_area_sqkm) END
AS land_area_2016
                           FROM forestation a
                           JOIN forestation b
                           ON a.country_name = b.country_name
                           WHERE b.year = 2016 AND a.year = 1990
                           GROUP BY 1, 2, a.year, b.year)
SELECT country_name,
               land_area_1990,
       land_area_2016
FROM land_area_table
WHERE country_name != 'World'
AND land_area_1990 IS NOT NULL
AND land_area_2016 IS NOT NULL
ORDER BY 3 DESC
LIMIT 5;
```

country_name	land_area_1990	land_area_2016
Russian Federation	16389949.9918	16376869.9997
China	9388250.0005	9388210.0109
United States	9158959.9941	9147419.9901
Canada	9093509.9948	9093509.9948
Brazil	8358139.9972	8358139.9972

Total land area of Iceland in 1990 and 2016

```
SELECT country_name,
        year,
        total_area_sqkm
FROM forestation
WHERE country_name = 'Iceland'
AND (year = 1990 OR year = 2016);
```

country_name	year	total_area_sqkm
Iceland	2016	100249.9904
Iceland	1990	100249.9904

Question 3A

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 source_table AS (SELECT a.country_name,
                             a.region,
                             CASE WHEN a.year = 1990 THEN SUM(a.forest_area_sqkm) END AS
forest_area_1990,
                             CASE WHEN b.year = 2016 THEN SUM(b.forest_area_sqkm) END AS
forest_area_2016
                             FROM forestation a
                             JOIN forestation b
                             ON a.country_name = b.country_name
                             WHERE b.year = 2016 AND a.year = 1990
                             GROUP BY 1, 2, a.year, b.year)
SELECT country_name,
               region,
           (forest_area_1990 - forest_area_2016) AS absolute_forest_area_change
FROM source_table
WHERE country_name != 'World'
AND forest_area_1990 IS NOT NULL
AND forest_area_2016 IS NOT NULL
ORDER BY 3 DESC
LIMIT 5;
```

country_name	region	absolute_forest_area_change
Brazil	Latin America & Caribbean	541510
Indonesia	East Asia & Pacific	282193.9844
Myanmar	East Asia & Pacific	107234.0039
Nigeria	Sub-Saharan Africa	106506.00098
Tanzania	Sub-Saharan Africa	102320

Question 3B

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 source_table AS (SELECT a.country_name,
                             a.region,
                             CASE WHEN a.year = 1990 THEN SUM(a.forest_area_sqkm) END AS
forest_area_1990,
                             CASE WHEN b.year = 2016 THEN SUM(b.forest_area_sqkm) END AS
forest_area_2016
                             FROM forestation a
                             JOIN forestation b
                             ON a.country_name = b.country_name
                             WHERE b.year = 2016 AND a.year = 1990
                             GROUP BY 1, 2, a.year, b.year)
SELECT country_name,
            region,
        ROUND(CAST((forest_area_1990 - forest_area_2016) / forest_area_1990 * 100 AS
numeric), 2) AS pct_forest_area_change
FROM source_table
WHERE country_name != 'World'
AND forest_area_1990 IS NOT NULL
AND forest_area_2016 IS NOT NULL
ORDER BY 3 DESC
LIMIT 5;
```

country_name	region	pct_forest_area_change
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

Question 3C

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

```
WITH quartiles_table AS (SELECT country_name,
                         forest_to_land_percentage,
                         CASE WHEN forest_to_land_percentage BETWEEN 0 AND 25 THEN '0-25%'
                        WHEN forest_to_land_percentage BETWEEN 25 and 50 THEN '25-50%'
                         WHEN forest_to_land_percentage BETWEEN 50 AND 75 THEN '50-75%'
                         ELSE '75-100%' END AS quartiles
                         FROM forestation
                         WHERE year = 2016 AND forest_to_land_percentage IS NOT NULL
                         GROUP BY 1, 2)

SELECT quartiles, COUNT(*)
FROM quartiles_table
GROUP BY 1
ORDER BY 1;
```

quartiles	count
0-25%	85
25-50%	73
50-75%	38
75-100%	9

Question 3D

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

```
SELECT country_name,
        region,
        forest_to_land_percentage
FROM forestation
WHERE year = 2016
AND forest_to_land_percentage > 75
AND forest_to_land_percentage IS NOT NULL
ORDER BY 3 DESC;
```

country_name	region	forest_to_land_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

Question 3E

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

```
SELECT COUNT(country_name) "Number of Countries with forestation higher than the US 1n
2016"
FROM forestation
WHERE year = 2016
AND forest_to_land_percentage > (SELECT forest_to_land_percentage
                                 FROM forestation
                                 WHERE year = 2016 AND country_name = 'United States')
```

Number of Countries with forestation higher than the US 1n 2016
94