

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.

Do not mention the text in boxes marked red. As it is not good presentation.

1. GLOBAL SITUATION

Correct but presentation is **41,282,694.9 sqkm**

According to the World Bank, the total forest area of the world was

1.1 41282694.9 in 1990. As of 2016, the most recent year for which data was available, that number had fallen to 1.2 39958245.9, a loss of

1.3 1324449, or 1.4 3.2 %.

The forest area lost over this time period is slightly more than the entire land area of 1.5 1279999.99 listed for the year 2016 (which is Peru).

2. REGIONAL OUTLOOK

Marked answers are incorrect please check query again.

In 2016, the percent of the total land area of the world designated as forest was

2.1 31.38. The region with the highest relative forestation was

2.2 East Asia & Pacific, with 50.09 %, and the region with the lowest relative forestation was 2.3 Middle East & North Africa, with 3.19 % forestation.

In 1990, the percent of the total land area of the world designated as forest was

2.4 32.42. The region with the highest relative forestation was

2.5 East Asia & Pacific, with 98.91 %, and the region with the lowest relative forestation was 2.6 Middle East & North Africa, with 2.69 % forestation.

Presentation is bad, write answers in bold and black.

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

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

Answers below and table are not matching, please write correct and consistent answers in table and below.

The only regions of the world that decreased in percent forest area from 1990 to 2016 were 2.8 _____ Latin America & Caribbean _____ (dropped from 2.8 _____ 43.34 _____ % to 2.8 _____ 41.64 _____ %) and 2.8 _____ Sub-Saharan Africa _____ (2.8 _____ 35.26 _____ % to 2.8 _____ 31.28 _____ %). 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 2.8 _____ 32.42 _____ % to 2.8 _____ 31.38 _____ %.

3. COUNTRY-LEVEL DETAIL

A SUCCESS STORIES

There is one particularly bright spot in the data at the country level,

3.1 _____ China _____. This country actually increased in forest area from 1990 to 2016 by 3.1 _____ 527229.06 sqkm _____. 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 3.1 _____ United States _____, but it only saw an increase of _____ 79200.00 sqkm _____, much lower than the figure for _____ China _____.

3.1 _____ 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

Please write single and correct answer.

from 1990 to 2016, we aren't surprised to find a much smaller country listed at the top

3.2 _____ French Polynesia or Iceland _____ increased in forest area by _____ 27.32 or
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 3 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:

Correct table

Country	Region	Absolute Forest Area Change
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

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:

answers are marginally incorrect.

Country	Region	Pct Forest Area Change
Togo	Sub-Saharan Africa	75.46
Nigeria	Sub-Saharan Africa	61.79
Uganda	Sub-Saharan Africa	59.29
Mauritania	Sub-Saharan Africa	47.50
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 _____, _____ Nigeria _____,

_____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:

Correct.

Quartile	Number of Countries
quartile_1	85
quartile_2	72
quartile_3	38
quartile_4	9

The largest number of countries in 2016 were found in the 3.5_____quartile_1_____ quartile.

There were 3.5_____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

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

96 countries

Incorrect.

5. RECOMMENDATIONS

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

- *What have you learned from the World Bank data?*
- *Which countries should we focus on over others?*

Global Situation

While the majority of regions are on a growth path, a few regions are overlooking these achievements. A closer look at the East Asia & Pacific region shows that the outlook is only positive thanks to the enormous contribution of China.

Situation Africa

The data show that the situation in sub-Saharan Africa needs to be closely monitored. Once desertification due to deforestation takes hold, many more environmental problems will follow.

It is vital to work with local communities and community leaders to create an understanding of sustainable forest management. In addition, the affected communities in this region often practice slash-and-burn logging. This is a common mistake that needs to be corrected.

Situation South America

In this region, the local authorities are for the most part actively involved in deforestation in order to gain agricultural land. This development should be counteracted as soon as possible. The soil quality in this region is poor, and only thanks to the winds that bring sand from sub-Saharan Africa and the minerals and nutrients it contains can this region flourish. However, once the forest is gone, agriculture is only possible through the application of fertilizers over large areas. This is not sustainable at all and aggravates the looming phosphorus crisis.

Mention name of countries that need to be focused, that have huge decrease in forest area.

Countries to be monitored

Generally in large countries with an extensive forest reserve, but where more and more wood is felled or burned. These countries have a responsibility towards global forest health. And they must be encouraged to rise to the challenge. I think that the lists in this analysis are self-explanatory, so that a listing of countries with either percentage or absolute decreasing forest area is not necessary (see table Table 3.2 and Table 3.1).

Appendix

6. CODE for project

general view

If no view is specifically mentioned it means that this view here has been used:

```
CREATE VIEW forestation
AS
  SELECT f.country_code,
         f.country_name,
         f.year,
         f.forest_area_sqkm,
         land.total_area_sq_mi,
         land.total_area_sq_mi * 2.59 AS total_area_sqkm,
         r.region,
         r.income_group,
         ( Sum(f.forest_area_sqkm) / Sum(land.total_area_sq_mi * 2.59) ) * 100
         forest_percent
  FROM forest_area f
  INNER JOIN land_area land
  ON land.country_code = f.country_code
  AND land.year = f.year
  INNER JOIN regions r
  ON r.country_code = land.country_code
  GROUP BY f.country_code,
           f.country_name,
           f.year,
           f.forest_area_sqkm,
           land.total_area_sq_mi,
           r.region,
           r.income_group;
```

Correct but no need to sum and group by.

1. global situation:

1.1 1990 forest query:

```
SELECT forest_area_sqkm
FROM forestation
WHERE country_name = 'World' AND year = '1990';
```

1.2 2016 forest query:

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

1.3 forest_loss query:

```
WITH t1
AS
(
    SELECT *
    FROM forestation
), t2
AS
(
    SELECT t1.forest_area_sqkm AS new_f, t1.country_code
    FROM t1
    WHERE t1.country_name = 'World' AND t1.year = '2016'
), t3
AS
(
    SELECT t1.forest_area_sqkm AS old_f, t1.country_code
    FROM t1
    WHERE t1.country_name = 'World' AND t1.year = '1990'
)
SELECT (old_f - new_f) AS forest_loss
FROM t2
JOIN t3
ON t2.country_code = t3.country_code;
```

1.4 forest_loss percent query:

```
WITH t1
AS
(
    SELECT *
    FROM forestation
), t2
AS
(
    SELECT t1.forest_area_sqkm AS new_f, t1.country_code
    FROM t1
    WHERE t1.country_name = 'World' AND t1.year = '2016'
), t3
AS
(
    SELECT t1.forest_area_sqkm AS old_f, t1.country_code
    FROM t1
    WHERE t1.country_name = 'World' AND t1.year = '1990'
)
SELECT ((old_f - new_f)/old_f)*100 AS loss
```



```
FROM t2
JOIN t3
ON t2.country_code = t3.country_code;
```

1.5 lost forest size country 2016 hardcoded: (works)

```
SELECT country_name, ROUND(CAST(total_area_sqkm AS numeric), 2) AS total_area_sqkm
FROM forestation
WHERE total_area_sqkm < 1324449 AND year = '2016'
ORDER BY total_area_sqkm DESC
LIMIT 1;
```

direct: (not working because the filter takes out all countries, how to do?)

```
WITH t1
AS
(
    SELECT forest_area_sqkm AS new_f, country_code
    FROM forestation
    WHERE country_name = 'World' AND year = '2016'
), t2
AS
(
    SELECT forest_area_sqkm AS old_f, country_code
    FROM forestation
    WHERE country_name = 'World' AND year = '1990'
)
SELECT *
FROM forestation
JOIN t1
ON forestation.country_code = t1.country_code
JOIN t2
ON forestation.country_code = t2.country_code
WHERE total_area_sqkm < (old_f - new_f) AND year = '2016'
ORDER BY total_area_sqkm DESC;
```

Hint is inner query and try to substitute 1324449 above with inner query.

2. Regional Outlook

2.1 forest area percent of world relative to land area in 2016 query:

```
SELECT country_name, ROUND(CAST(forest_percent AS numeric), 2) AS forest_percent, year
FROM forestation
WHERE country_name = 'World' AND year = '2016';
```

2.2 highest forest percentage relative to land in 2016 query:

```
SELECT region, ROUND(CAST(AVG(forest_percent) AS NUMERIC), 2) forest_percent
FROM forestation
```

Not correct, instead of avg use expression i.e.
 $\text{SUM}(\text{forest_area_sqkm}) / \text{SUM}(\text{total_area_sqkm}) * 100$

```
WHERE year = '2016'  
AND forest_percent IS NOT NULL  
AND region != 'World'  
GROUP BY 1  
ORDER BY forest_percent DESC  
LIMIT 1;
```

2.3 lowest forest percentage relative to land in 2016 query:

```
SELECT region, ROUND(CAST(AVG(forest_percent) AS NUMERIC), 2) forest_percent  
FROM forestation  
WHERE year = '2016'  
AND forest_percent IS NOT NULL  
AND region != 'World'  
GROUP BY 1  
ORDER BY forest_percent  
LIMIT 1;
```

Not correct, instead of avg use expression i.e.
 $\text{SUM}(\text{forest_area_sqkm}) / \text{SUM}(\text{total_area_sqkm}) * 100$

2.4 forest area percent of world relative to land area in 1990 query:

```
SELECT country_name, ROUND(CAST(forest_percent AS numeric), 2) AS forest_percent, year  
FROM forestation  
WHERE country_name = 'World' AND year = '1990';
```

2.5 highest forest percentage relative to land in 1990 query:

```
SELECT region, ROUND(CAST(AVG(forest_percent) AS NUMERIC), 2) forest_percent  
FROM forestation  
WHERE year = '1990'  
AND forest_percent IS NOT NULL  
AND region != 'World'  
GROUP BY 1  
ORDER BY forest_percent DESC  
LIMIT 1;
```

Not use avg

2.6 lowest forest percentage relative to land in 1990 query:

```
SELECT region, ROUND(CAST(AVG(forest_percent) AS NUMERIC), 2) forest_percent  
FROM forestation  
WHERE year = '1990'  
AND forest_percent IS NOT NULL  
AND region != 'World'  
GROUP BY 1  
ORDER BY forest_percent  
LIMIT 1;
```

Not use avg.

2.7 forest percentage values by region (Table 2.1: Percent Forest Area by Region, 1990 & 2016) When I tried to use the general forestation view it didn't work: why? I think because it is an aggregation on top of another aggregation SUM used twice, and subqueries can only handle that.

query:

```
SELECT region, year, SUM(forest_percent)
FROM forestation
WHERE year = '2016' OR year = '1990'
GROUP BY region, year
ORDER BY region, year, forest_percent;
```

forest_percent should not come in order by, even then query is incorrect.

So I used an inline subquery:

```
SELECT region, year, ROUND(CAST(SUM(forest_percent) AS NUMERIC), 2) AS forest_p
FROM (
  (SELECT region, f.year,
   ( Sum(f.forest_area_sqkm) / Sum(land.total_area_sq_mi * 2.59) ) * 100
   AS forest_percent
   FROM forest_area f
   INNER JOIN land_area land
   ON land.country_code = f.country_code
   AND land.year = f.year
   INNER JOIN regions r
   ON r.country_code = land.country_code
   WHERE f.year = '1990' OR f.year = '2016'
   GROUP BY region, f.year)
) as sub
GROUP BY region, year
ORDER BY region, year, forest_p;
```

This query is correct.

2.8 comparing 2016 to 1990 forest percentage relative to land_area

query:

```
WITH t2 AS
(
  SELECT region, f.year, f.country_code c_code,
  ( Sum(f.forest_area_sqkm) / Sum(land.total_area_sq_mi * 2.59) ) * 100
  AS forest_percent
  FROM forest_area f
  INNER JOIN land_area land
  ON land.country_code = f.country_code
  AND land.year = f.year
  INNER JOIN regions r
  ON r.country_code = land.country_code
  WHERE f.year = '2016'
  GROUP BY region, f.year, c_code
```

Incorrect, do not use avg

```

), t3 AS
(
    SELECT region, f.year, f.country_code c_code,
           ( Sum(f.forest_area_sqkm) / Sum(land.total_area_sq_mi * 2.59) ) * 100
           AS forest_percent
    FROM forest_area f
    INNER JOIN land_area land
    ON land.country_code = f.country_code
    AND land.year = f.year
    INNER JOIN regions r
    ON r.country_code = land.country_code
    WHERE f.year = '1990'
    GROUP BY region, f.year, c_code
)
SELECT t2.region, t2.year y_16, ROUND(CAST(AVG(t2.forest_percent) AS NUMERIC), 2)
      AS f_percent_16,
      t3.year y_90, ROUND(CAST(AVG(t3.forest_percent) AS NUMERIC), 2)
      AS f_percent_90
FROM t2
JOIN t3
ON t2.c_code = t3.c_code
GROUP BY 1, 2, 4
HAVING AVG(t2.forest_percent) < AVG(t3.forest_percent)

```

3. COUNTRY-LEVEL DETAIL

Use forestation view to make query as it will make your query concise.

3.1 A: largest growth in total_forest_area from 1990 to 2016 query:

```

WITH t2 AS
(
    SELECT f.country_name, f.year y_16, f.country_code c_code,
           f.forest_area_sqkm f_area_16
    FROM forest_area f
    INNER JOIN land_area land
    ON land.country_code = f.country_code
    AND land.year = f.year
    INNER JOIN regions r
    ON r.country_code = land.country_code
    WHERE f.year = '2016'
), t3 AS
(
    SELECT f.country_name, f.year y_90, f.country_code c_code,
           f.forest_area_sqkm f_area_90
    FROM forest_area f
    INNER JOIN land_area land
    ON land.country_code = f.country_code

```

```

        AND land.year = f.year
        INNER JOIN regions r
        ON r.country_code = land.country_code
        WHERE f.year = '1990'
    )
    SELECT *, ROUND(CAST((t2.f_area_16 - t3.f_area_90) AS numeric), 2)
    AS f_area_growth
    FROM t3
    JOIN t2
    ON t2.c_code = t3.c_code
    WHERE t2.f_area_16 IS NOT NULL AND t3.f_area_90 IS NOT NULL
    ORDER BY f_area_growth DESC;

```

3.2 A: largest growth in percent from 1990 to 2016 query: Iceland

```

WITH CTE
AS
(
    SELECT
    t1.country_name, t1.forest_percent_1990, t2.forest_percent_2016,
    ( t2.forest_percent_2016 - t1.forest_percent_1990 ) /
    t1.forest_percent_1990 * 100 AS forest_percent_increase
    FROM (SELECT
        country_name, forest_percent
        AS forest_percent_1990
        FROM forestation
        WHERE year = 1990
        AND forest_area_sqkm IS NOT NULL
        AND total_area_sq_mi IS NOT NULL
        GROUP BY 1, 2) t1
    JOIN (SELECT
        country_name, forest_percent
        AS forest_percent_2016
        FROM forestation
        WHERE year = 2016
        AND forest_area_sqkm IS NOT NULL
        AND total_area_sq_mi IS NOT NULL
        GROUP BY 1, 2) t2
    ON t1.country_name = t2.country_name
    WHERE t2.forest_percent_2016 > t1.forest_percent_1990
    ORDER BY 4 desc
)
SELECT country_name,
ROUND(CAST( forest_percent_increase AS NUMERIC), 2) AS forest_percent_increase
FROM CTE
LIMIT 1;

```

query: French Polynesia

```
WITH t2 AS
(
    SELECT country_name, year, country_code c_code, forest_percent
    FROM forestation
    WHERE year = '2016'
), t3 AS
(
    SELECT country_name, year, country_code c_code, forest_percent
    FROM forestation
    WHERE year = '1990'
), t4 AS
(
    SELECT t2.country_name, t2.year y_16, t2.forest_percent f_percent_16,
    t3.year y_90, t3.forest_percent f_percent_90
    FROM t2
    JOIN t3
    ON t2.c_code = t3.c_code
)
SELECT *, ROUND(CAST((f_percent_16 - f_percent_90) AS numeric), 2)
AS f_percent_gained
FROM t4
GROUP BY country_name, y_16, y_90, f_percent_16, f_percent_90
HAVING f_percent_16 > f_percent_90 AND
f_percent_16 - f_percent_90 = MAX(f_percent_16 - f_percent_90)
ORDER BY f_percent_gained DESC
LIMIT 1;
```

3.3 B: Top 5 Amount Decrease in Forest Area by Country query:

```
WITH t1 AS
(
    SELECT country_code code_16, country_name, region, year y_16,
    ROUND(CAST(forest_area_sqkm AS NUMERIC), 2) AS f_area_16
    FROM forestation
    WHERE year = '2016'
    AND forest_area_sqkm IS NOT NULL
    AND country_name != 'World'
), t2 AS
(
    SELECT country_code code_90, country_name, region,
    ROUND(CAST(forest_area_sqkm AS NUMERIC), 2) AS f_area_90
    FROM forestation
    WHERE year = '1990'
    AND forest_area_sqkm IS NOT NULL
```

```

        AND country_name != 'World'
    )
    SELECT t1.country_name, t1.region, f_area_90 - f_area_16 AS f_area_lost,
           f_area_90, f_area_16
    FROM t1
    JOIN t2
    ON code_16 = code_90
    ORDER BY f_area_lost DESC;

```

3.4 B: Top 5 Percent Decrease in Forest Area by Country query:

```

WITH t1 AS
(
    SELECT country_code code_16, country_name, region, year y_16,
           ROUND(CAST(forest_percent AS NUMERIC), 2) AS f_percent_16
    FROM forestation
    WHERE year = '2016'
    AND forest_percent IS NOT NULL
), t2 AS
(
    SELECT country_code code_90, country_name, region, year y_90,
           ROUND(CAST(forest_percent AS NUMERIC), 2) AS f_percent_90
    FROM forestation
    WHERE year = '1990'
    AND forest_percent IS NOT NULL
)
SELECT t1.country_name, t1.region, Round(Cast(( ( f_percent_90 -
f_percent_16 ) / f_percent_90 ) * 100 AS NUMERIC), 2) AS f_percent_decrease,
f_percent_16, f_percent_90
FROM t1
JOIN t2
ON code_16 = code_90
WHERE f_percent_90 != 0
ORDER BY f_percent_decrease DESC;

```

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

```

CREATE VIEW forestation
AS
SELECT f.country_code,
       f.country_name,
       f.year,
       f.forest_area_sqkm,
       land.total_area_sq_mi,
       land.total_area_sq_mi * 2.59 AS total_area_sqkm,

```

Do not create 2 view query and group by is not required.

```

r.region,
r.income_group
FROM forest_area f
INNER JOIN land_area land
ON land.country_code = f.country_code
AND land.year = f.year
INNER JOIN regions r
ON r.country_code = land.country_code
GROUP BY f.country_code,
f.country_name,
f.year,
f.forest_area_sqkm,
land.total_area_sq_mi,
r.region,
r.income_group

query:
WITH t1 AS
(
    SELECT country_name, year,
    (forest_area_sqkm/ total_area_sqkm) AS
    f_percent_16
    FROM forestation
    WHERE year = 2016
    AND country_name != 'World'
    AND forest_area_sqkm IS NOT NULL
    AND total_area_sqkm IS NOT NULL
)
SELECT
    Count( CASE
    WHEN t1.f_percent_16 < 0.25 THEN 1
    ELSE NULL
    END) AS quartile_1,
    Count( CASE
    WHEN t1.f_percent_16 > 0.25
    AND t1.f_percent_16 < 0.50 THEN 1
    ELSE NULL
    END) AS quartile_2,
    Count( CASE
    WHEN t1.f_percent_16 > 0.50
    AND t1.f_percent_16 < 0.75 THEN 1
    ELSE NULL
    END) AS quartile_3,
    Count( CASE
    WHEN t1.f_percent_16 > 0.75 THEN 1
    ELSE NULL

```



```

    END) AS quartile_4
FROM t1

```

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

```

CREATE VIEW forestation
AS
  SELECT f.country_code,
         f.country_name,
         f.year,
         f.forest_area_sqkm,
         land.total_area_sq_mi,
         land.total_area_sq_mi * 2.59 AS total_area_sqkm,
         r.region,
         r.income_group
  FROM forest_area f
  INNER JOIN land_area land
  ON land.country_code = f.country_code
  AND land.year = f.year
  INNER JOIN regions r
  ON r.country_code = land.country_code
  GROUP BY f.country_code,
           f.country_name,
           f.year,
           f.forest_area_sqkm,
           land.total_area_sq_mi,
           r.region,
           r.income_group

```

Please do not create multiple view queries.

query:

```

SELECT country_name, year, region,
  ROUND(CAST((forest_area_sqkm/ total_area_sqkm) * 100 AS NUMERIC), 2) AS
  f_percent_16
FROM forestation
WHERE year = 2016
  AND country_name != 'World'
  AND forest_area_sqkm IS NOT NULL
  AND total_area_sqkm IS NOT NULL
  AND (forest_area_sqkm/ total_area_sqkm) * 100 > 75
ORDER BY f_percent_16 DESC;

```

3.7 C: How many countries had a percent forestation higher than the United States in 2016? view:

```

CREATE VIEW forestation
AS
  SELECT f.country_code,
         f.country_name,
         f.year,
         f.forest_area_sqkm,
         land.total_area_sq_mi,
         land.total_area_sq_mi * 2.59 AS total_area_sqkm,
         r.region,
         r.income_group
  FROM forest_area f
  INNER JOIN land_area land
    ON land.country_code = f.country_code
  AND land.year = f.year
  INNER JOIN regions r
    ON r.country_code = land.country_code
  GROUP BY f.country_code,
         f.country_name,
         f.year,
         f.forest_area_sqkm,
         land.total_area_sq_mi,
         r.region,
         r.income_group

```

hardcoded query: (works)

```

WITH t1 AS
(
  SELECT country_name, year,
         (forest_area_sqkm/ total_area_sqkm) AS
         f_percent_16
  FROM forestation
  WHERE year = 2016
  AND country_name != 'World'
  AND forest_area_sqkm IS NOT NULL
  AND total_area_sqkm IS NOT NULL
  AND (forest_area_sqkm/ total_area_sqkm) > 0.34
)
SELECT
  COUNT(*) AS country_counter
FROM t1

```

Try to use inner query or sub query to replace hard coded values.

I tried this with 2 CTEs:

```

WITH t1 AS
(
  SELECT country_name, year,
         (forest_area_sqkm/ total_area_sqkm) AS

```

```

        f_percent_16
    FROM forestation
    WHERE year = 2016
    AND country_name != 'World'
    AND forest_area_sqkm IS NOT NULL
    AND total_area_sqkm IS NOT NULL
    AND (forest_area_sqkm/ total_area_sqkm) > 0.34
), t2 AS
(
    SELECT country_name, f_percent_16 AS f_percent_16_US
    FROM t1
    WHERE country_name = 'United States'
)
SELECT
    COUNT( CASE
        WHEN f_percent_16 > f_percent_16_US THEN 1
        ELSE NULL
    END) AS country_counter
FROM t1
JOIN t2
ON t1.country_name = t2.country_name

```

OR this with CTE and inline subquery:

```

WITH t1 AS
(
    SELECT country_name, year,
        (forest_area_sqkm/ total_area_sqkm) AS f_percent_16_US
    FROM forestation
    WHERE country_name = 'United States'
    AND year = 2016
)
SELECT
    COUNT( CASE
        WHEN f_percent_16 > f_percent_16_US THEN 1
        ELSE NULL
    END) AS country_counter
FROM (
    SELECT country_name, year,
        (forest_area_sqkm/ total_area_sqkm) AS
        f_percent_16
    FROM forestation
    WHERE year = 2016
    AND country_name != 'World'
    AND forest_area_sqkm IS NOT NULL
    AND total_area_sqkm IS NOT NULL
) sub

```

```
JOIN t1
ON t1.country_name = sub.country_name
```

But both solutions don't count 0.