```
DROP VIEW IF EXISTS forestation;

CREATE VIEW forestation
AS
(SELECT fa.country_code ,
              fa.country_name ,
              fa.year as year, fa.forest_area_sqkm,
              la.total_area_sq_mi,
              la.total_area_sq_mi * 2.59 as total_area_sq_km,
              (fa.forest_area_sqkm/(la.total_area_sq_mi * 2.59))*100 as
        percent_sq_km_forest,
              r.region, r.income_group
 FROM forest_area as fa
 JOIN land_area as la
 ON fa.country_code = la.country_code
 AND fa.year = la.year
 JOIN regions as r
 ON la.country_code = r.country_code
)
```

Part 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 fa.country_name, fa.forest_area_sqkm
FROM forest_area as fa
JOIN regions as r
ON fa.country_name = r.country_name
WHERE r.country_name = 'World' AND fa.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 fa.country_name ,fa.forest_area_sqkm
FROM forest_area as fa
JOIN regions as r
ON fa.country_name = r.country_name
WHERE r.country_name = 'World' AND fa.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 fa.forest_area_sqkm, fa.country_name as fa_name
FROM forest_area as fa
JOIN regions as r
ON fa.country_name = r.country_name
WHERE r.country_name = 'World' AND fa.year = '2016'
  ),
  t2 as (
SELECT fa.forest_area_sqkm, fa.country_name as fa_name
FROM forest_area as fa
JOIN regions as r
ON fa.country_name = r.country_name
WHERE r.country_name = 'World' AND fa.year = '1990'
)

SELECT t2.forest_area_sqkm - t1.forest_area_sqkm as change_from_1990_2016
FROM t1
JOIN t2
ON t1.fa_name = t2.fa_name

--

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

```
with t1 as(
   SELECT fa.forest_area_sqkm, fa.country_name as fa_name
FROM forest_area as fa
JOIN regions as r
ON fa.country_name = r.country_name
WHERE r.country_name = 'World' AND fa.year = '2016'
   ),
   t2 as (
SELECT fa.forest_area_sqkm, fa.country_name as fa_name
FROM forest_area as fa
JOIN regions as r
ON fa.country_name = r.country_name
WHERE r.country_name = 'World' AND fa.year = '1990'
)

SELECT (t2.forest_area_sqkm  - t1.forest_area_sqkm)/(t2.forest_area_sqkm)*100 as
change_from_1990_2016
FROM t1
JOIN t2
ON t1.fa_name = t2.fa_name
```

--

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 table_dif as(
 SELECT fa.country_name as name,
       sum(fa.forest_area_sqkm) as total_forest_area,
      lag(sum(fa.forest_area_sqkm)) over (order by fa.year) as
      TOTAL_FOREST_AREA_PREVIOUS_YEAR,
      SUM(fa.forest_area_sqkm) - lag(sum(fa.forest_area_sqkm)) over (order by fa.year) as dif,
      fa.year as year
 FROM forest_area as fa
 WHERE fa.country_name='World' and fa.year IN ('1990', '2016')
 GROUP BY 1,5
 ORDER BY 5 DESC
 )

SELECT la.country_name, la.total_area_sq_mi as closest_to_dif
FROM land_area as la
JOIN table_dif
ON la.year = table_dif.year
WHERE la.total_area_sq_mi * 2.59 < ABS(dif) AND table_dif.year = '2016'
GROUP BY 1,2
ORDER BY 2 DESC
LIMIT 1
```

Part 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?
--

```
SELECT ROUND((fa.forest_area_sqkm/(la.total_area_sq_mi*2.59)*100)::numeric,2) as
        percent, fa.country_name as fa_name
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '2016'
-- WHERE r.country_name = 'World' AND fa.year = '2016'
GROUP BY 1
ORDER BY 2 DESC
--ORDER BY 2 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?
--

```
SELECT ROUND((fa.forest_area_sqkm/(la.total_area_sq_mi*2.59)*100)::numeric,2) as
        percent, fa.country_name as fa_name
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '1990'
--WHERE r.country_name = 'World' AND fa.year = '1990'
GROUP BY 1
ORDER BY 2 DESC
--ORDER BY 2 ASC
LIMIT 1
```

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

```
with t1 as(
SELECT r.region as region,
        ROUND(((sum(fa.forest_area_sqkm)/(sum(la.total_area_sq_mi)*2.59))*100)::numeric,2)
as percent_1990
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '1990'
GROUP BY 1
ORDER BY 2 DESC
--ORDER BY 2 ASC
),
t2 as(
SELECT r.region as region,
        ROUND(((sum(fa.forest_area_sqkm)/(sum(la.total_area_sq_mi)*2.59))*100)::numeric,2)
as percent_2016
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '2016'
GROUp BY 1
ORDER BY 2 DESC
--ORDER BY 2 ASC
)
SELECT t1.region, t1.percent_1990, t2.percent_2016,
                t2.percent_2016- t1.percent_1990 as deacrese
FROM t1
JOIN t2
ON t1.region = t2.region
```

Part 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 t1 as(
SELECT fa.country_name as c_name,
                ROUND(sum(fa.forest_area_sqkm)::numeric,2) as forest_1990
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '1990'
GROUP BY 1
ORDER BY 2 DESC
--ORDER BY 2 ASC),
t2 as(
SELECT fa.country_name as c_name,
                ROUND(sum(fa.forest_area_sqkm)::numeric,2) as forest_2016
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '2016'
GROUp BY 1
ORDER BY 2 DESC
--ORDER BY 2 ASC)
SELECT t1.c_name, t1.forest_1990, t2.forest_2016,
                t2.forest_2016- t1.forest_1990 as change
FROM t1
JOIN t2
ON t1.c_name = t2.c_name
WHERE forest_1990 is not null AND forest_2016 is not null
AND t1.c_name != 'World'
ORDER BY 4 ASC
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?
--

```sql
with t1 as(
SELECT fa.country_name as c_name,
        ROUND((fa.forest_area_sqkm)::numeric,2) as forest_1990
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '1990'
GROUP BY 1,2
ORDER BY 2 DESC
--ORDER BY 2 ASC
),
t2 as(
SELECT fa.country_name as c_name,
        ROUND((fa.forest_area_sqkm)::numeric,2) as forest_2016
FROM forest_area as fa
JOIN land_area as la
ON fa.country_code = la.country_code AND la.year=fa.year
JOIN regions as r
ON fa.country_name = r.country_name
WHERE fa.year = '2016'
GROUp BY 1,2
ORDER BY 2 DESC
--ORDER BY 2 ASC
)
SELECT t1.c_name, t1.forest_1990, t2.forest_2016,
        round(((t2.forest_2016- t1.forest_1990)*100/t1.forest_1990)::numeric,2) as change
FROM t1
JOIN t2
ON t1.c_name = t2.c_name
WHERE forest_1990 is not null AND forest_2016 is not null
ORDER BY 4 ASC
LIMIT 5
```

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

```sql
with t as(
SELECT fa.country_name, fa.year as year,
        (fa.forest_area_sqkm)/(la.total_area_sq_mi * 2.59)*100 AS forest_percent
```

```
 FROM forest_area as fa
 JOIN land_area as la
 ON fa.country_code = la.country_code AND fa.year = la.year
WHERE fa.year = 2016
GROUP BY 1,2,3
)
SELECT res.range,
         count(1)
FROM (SELECT CASE
                    WHEN t.forest_percent BETWEEN 0 AND 25
                         THEN ' 0- 25'
                    WHEN t.forest_percent BETWEEN 25 AND 50
                         THEN '25-50'
                    WHEN t.forest_percent BETWEEN 50 AND 75
                         THEN '50-75'
                    ELSE '75-100'
                    END AS range
       FROM t
       WHERE t.year = 2016
            AND forest_percent IS NOT NULL)
        res
GROUP BY res.range
ORDER BY res.range
          ,count DESC
```

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

```
with t as(
SELECT fa.country_name, fa.year as year, r.region as region,
```

```
            ROUND((((fa.forest_area_sqkm)/(la.total_area_sq_mi * 2.59)*100)::numeric,2) AS
forest_percent
 FROM forest_area as fa
 JOIN land_area as la
 ON fa.country_code = la.country_code AND fa.year = la.year
  JOIN regions as r
  ON r.country_code = fa.country_code
WHERE fa.year = 2016
GROUP BY 1,2,3, 4
)
SELECT t.country_name, t.forest_percent, t.region
FROM t
WHERE forest_percent BETWEEN 75 AND 100
ORDER BY 2 DESC
```

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

```
with t as(
SELECT fa.country_name, fa.year as year, r.region as region,
        ROUND((((fa.forest_area_sqkm)/(la.total_area_sq_mi * 2.59)*100)::numeric,2) AS
forest_percent
 FROM forest_area as fa
 JOIN land_area as la
 ON fa.country_code = la.country_code AND fa.year = la.year
  JOIN regions as r
  ON r.country_code = fa.country_code
WHERE fa.year = 2016 AND fa.country_name = 'United States'
GROUP BY 1,2,3,4
)
```

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

```
with t as(
SELECT fa.country_name, fa.year, fa.forest_area_sqkm,
            la.total_area_sq_mi*2.59 as total_area_sqkm,
```

```
                    fa.forest_area_sqkm/(la.total_area_sq_mi*2.59)*100 as
        forest_percent
FROM forest_area fa
JOIN land_area la
ON fa.country_code = la.country_code and fa.year = la.year
JOIN regions as r
ON fa.country_code = r.country_code
)

SELECT COUNT(t.country_name)
FROM t
WHERE year=2016
AND t.forest_percent > (SELECT t.forest_percent
                FROM t
                WHERE t.year=2016 AND t.country_code='USA')
```