**1. GLOBAL SITUATION**

**View Creation :**

CREATE VIEW forestation AS

(

SELECT f.\*,l.total\_area\_sq\_mi,r.region,r.income\_group,

(f.forest\_area\_sqkm/(l.total\_area\_sq\_mi\*2.59))\*100 AS forest\_percent

FROM forest\_area f

JOIN land\_area l

ON f.country\_code=l.country\_code AND f.year=l.year

JOIN regions r

ON l.country\_code=r.country\_code

)

**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 region='World' AND 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 \*

FROM forestation

WHERE region='World' AND year='2016';

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

WITH temp1 AS (

SELECT forest\_area\_sqkm AS v1,country\_code

FROM forestation

WHERE region='World' AND year='1990'

),

temp2 AS (

SELECT forest\_area\_sqkm AS v2,country\_code

FROM forestation

WHERE region='World' AND year='2016'

)

SELECT \*,

v1-v2 AS diff

FROM temp1 t1

JOIN temp2 t2

ON t1.country\_code=t2.country\_code;

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

WITH temp1 AS (

SELECT forest\_area\_sqkm AS v1,country\_code

FROM forestation

WHERE region='World' AND year='1990'

),

temp2 AS (

SELECT forest\_area\_sqkm AS v2,country\_code

FROM forestation

WHERE region='World' AND year='2016'

)

SELECT \*,

v1-v2 AS diff,

((v1-v2)/v1)\*100 AS perc\_diff

FROM temp1 t1

JOIN temp2 t2

ON t1.country\_code=t2.country\_code;

**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 temp1 AS (

SELECT forest\_area\_sqkm AS forest\_area\_sqkm\_2019,country\_code

FROM forestation

WHERE region='World' AND year='1990'

),

temp2 AS (

SELECT forest\_area\_sqkm AS forest\_area\_sqkm\_2016,country\_code

FROM forestation

WHERE region='World' AND year='2016'

),

diffs AS(

SELECT \*,

forest\_area\_sqkm\_2019-forest\_area\_sqkm\_2016 AS diff,

((forest\_area\_sqkm\_2019-forest\_area\_sqkm\_2016)/forest\_area\_sqkm\_2019)\*100 AS perc\_diff

FROM temp1 t1

JOIN temp2 t2

ON t1.country\_code=t2.country\_code

)

SELECT total\_area\_sq\_mi AS tot,country\_code,country\_name,year,

(SELECT diff FROM diffs) AS ref

FROM land\_area

WHERE total\_area\_sq\_mi<(SELECT diff FROM diffs) AND year='2016'

ORDER BY total\_area\_sq\_mi DESC;

**2. REGIONAL OUTLOOK**

**View Creation :**

CREATE VIEW regional AS (

SELECT r.region,f.year, SUM(f.forest\_area\_sqkm) AS forest, SUM(l.total\_area\_sq\_mi) AS land, (SUM(f.forest\_area\_sqkm)/(SUM(l.total\_area\_sq\_mi)\*2.59)\*100) AS fpa

FROM regions r

JOIN forest\_area f

ON r.country\_code=f.country\_code

JOIN land\_area l

ON f.country\_code=l.country\_code AND f.year=l.year

WHERE f.year='2016' or f.year='1990'

GROUP BY r.region,f.year

);

**a.**

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

SELECT fpa,year

FROM regional

WHERE region='World' and year='2016';

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

SELECT fpa,year,region

FROM regional

WHERE year='2016'

ORDER BY fpa DESC

LIMIT 1;

**Which had the LOWEST, to 2 decimal places?**

SELECT fpa,year,region

FROM regional

WHERE year='2016'

ORDER BY fpa ASC

LIMIT 1;

**b.**

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

SELECT fpa,year

FROM regional

WHERE region='World' and year='1990';

**Which region had the HIGHEST percent forest in 1990**

SELECT fpa,year,region

FROM regional

WHERE year='2016'

ORDER BY fpa DESC

LIMIT 1;

**Which had the LOWEST, to 2 decimal places?**

SELECT fpa,year,region

FROM regional

WHERE year='2016'

ORDER BY fpa ASC

LIMIT 1;

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

SELECT \* FROM regional

ORDER BY region,year;

**3. COUNTRY-LEVEL DETAIL**

**View Creation :**

CREATE VIEW country AS

(

SELECT f.\*,l.total\_area\_sq\_mi,r.region,r.income\_group,

(f.forest\_area\_sqkm/(l.total\_area\_sq\_mi\*2.59))\*100 AS forest\_percent

FROM forest\_area f

JOIN land\_area l

ON f.country\_code=l.country\_code AND f.year=l.year

JOIN regions r

ON l.country\_code=r.country\_code

)

**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 f\_1990 AS (

SELECT \*

FROM country

WHERE year='1990'

),

f\_2016 AS (

SELECT \*

FROM country

WHERE year='2016'

)

SELECT f\_1990.country\_name,f\_1990.region,

f\_1990.forest\_area\_sqkm AS f\_1990,f\_2016.forest\_area\_sqkm AS f\_2016,

f\_1990.forest\_area\_sqkm-f\_2016.forest\_area\_sqkm AS diff

FROM f\_1990

JOIN f\_2016

ON f\_1990.country\_name=f\_2016.country\_name

WHERE f\_1990.forest\_area\_sqkm>f\_2016.forest\_area\_sqkm and f\_1990.country\_name!='World'

ORDER BY diff DESC

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?**

WITH f\_1990 AS (

SELECT \*

FROM country

WHERE year='1990'

),

f\_2016 AS (

SELECT \*

FROM country

WHERE year='2016'

)

SELECT f\_1990.country\_name,f\_1990.region,

f\_1990.forest\_area\_sqkm AS f\_1990,f\_2016.forest\_area\_sqkm AS f\_2016,

((f\_1990.forest\_area\_sqkm-f\_2016.forest\_area\_sqkm)/f\_1990.forest\_area\_sqkm)\*100 AS perc\_diff

FROM f\_1990

JOIN f\_2016

ON f\_1990.country\_name=f\_2016.country\_name

WHERE f\_1990.forest\_area\_sqkm>f\_2016.forest\_area\_sqkm

ORDER BY perc\_diff DESC

LIMIT 5;

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

SELECT Count(CASE WHEN forest\_percent < 25 THEN 1

ELSE NULL END) AS quartile\_1,

Count(CASE WHEN forest\_percent < 50 AND forest\_percent > 25 THEN 1

ELSE NULL END) AS quartile\_2,

Count(CASE WHEN forest\_percent < 75 AND forest\_percent > 50 THEN 1

ELSE NULL END) AS quartile\_3,

Count(CASE WHEN forest\_percent < 100 AND forest\_percent > 75 THEN 1

ELSE NULL END) AS quartile\_4

FROM forestation

WHERE year='2016';

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

SELECT \*

FROM forestation

WHERE year='2016' AND forest\_percent < 100 AND forest\_percent > 75

ORDER BY forest\_percent DESC;

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

WITH us\_p\_t AS(

SELECT forest\_percent AS us\_p

FROM forestation

WHERE year='2016' AND country\_name='United States'

)

SELECT COUNT(country\_name)

FROM forestation

WHERE year='2016' AND forest\_percent > (SELECT us\_p FROM us\_p\_t);

### SUCCESS STORIES (FROM TEMPLATE)

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 **527229.062**. 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 **79200**, much lower than the figure for **China**.

WITH f\_1990 AS (

SELECT \*

FROM country

WHERE year='1990'

),

f\_2016 AS (

SELECT \*

FROM country

WHERE year='2016'

)

SELECT f\_1990.country\_name,f\_1990.region,

f\_1990.forest\_area\_sqkm AS f\_1990,f\_2016.forest\_area\_sqkm AS f\_2016,

f\_2016.forest\_area\_sqkm-f\_1990.forest\_area\_sqkm AS inc

FROM f\_1990

JOIN f\_2016

ON f\_1990.country\_name=f\_2016.country\_name

WHERE f\_1990.forest\_area\_sqkm<f\_2016.forest\_area\_sqkm and f\_1990.country\_name!='World'

ORDER BY inc DESC

LIMIT 5;

**Russian Federation** and **China** 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 **213.664588870028** % from 1990 to 2016.

SELECT country\_name,total\_area\_sq\_mi

FROM forestation

WHERE year=2016 AND country\_name!='World' AND total\_area\_sq\_mi IS NOT NULL

ORDER BY total\_area\_sq\_mi DESC

LIMIT 5;

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WITH f\_1990 AS (

SELECT \*

FROM country

WHERE year='1990'

),

f\_2016 AS (

SELECT \*

FROM country

WHERE year='2016'

)

SELECT f\_1990.country\_name,f\_1990.region,

f\_1990.forest\_area\_sqkm AS f\_1990,f\_2016.forest\_area\_sqkm AS f\_2016,

((f\_2016.forest\_area\_sqkm-f\_1990.forest\_area\_sqkm)/f\_1990.forest\_area\_sqkm)\*100 AS perc\_inc

FROM f\_1990

JOIN f\_2016

ON f\_1990.country\_name=f\_2016.country\_name

WHERE f\_1990.forest\_area\_sqkm<f\_2016.forest\_area\_sqkm and f\_1990.country\_name!='World'

ORDER BY perc\_inc DESC

LIMIT 5;