

1) Fetch all the paintings which are not displayed ON any museums?

```
SELECT * FROM work WHERE museum_id is null;
```

2) Are there museums without any paintings?

```
SELECT * FROM museum m
WHERE not exists (SELECT 1 FROM work w
                  WHERE w.museum_id=m.museum_id)
```

3) How many paintings have an asking price of more than their regular price?

```
SELECT * FROM product_size
WHERE sale_price > regular_price;
```

4) Identify the paintings whose asking price is less than 50% of its regular price

```
SELECT *
FROM product_size
WHERE sale_price < (regular_price*0.5);
```

5) Which canvas size costs the most?

```
SELECT cs.label as canva, ps.sale_price
FROM (SELECT *
      , RANK() OVER(ORDER by sale_price desc) as rnk
      FROM product_size) ps
JOIN canvas_size cs ON cs.size_id::text=ps.size_id
WHERE ps.rnk=1;
```

6) Delete duplicate records FROM work, product_size, subject and image_link tables

```
delete FROM work
WHERE ctid not in (SELECT min(ctid)
                  FROM work
                  group by work_id );
```

```
delete FROM product_size
WHERE ctid not in (SELECT min(ctid)
                  FROM product_size
                  group by work_id, size_id );
```

```
delete FROM subject
WHERE ctid not in (SELECT min(ctid)
                  FROM subject
                  group by work_id, subject );
```

```
delete FROM image_link
WHERE ctid not in (SELECT min(ctid)
```

```
FROM image_link
group by work_id );
```

7) Identify the museums with invalid city information in the given dataset

```
SELECT * FROM museum
WHERE city ~ '^[0-9]'
```

8) Museum_Hours table has 1 invalid entry. Identify it and remove it.

```
delete FROM museum_hours
WHERE ctid not in (SELECT min(ctid)
                  FROM museum_hours
                  group by museum_id, day );
```

9) Fetch the top 10 most famous painting subject

```
SELECT *
FROM (
    SELECT s.subject, COUNT(1) as no_of_paintings
    , RANK() OVER(ORDER by COUNT(1) desc) as RANKing
    FROM work w
    JOIN subject s ON s.work_id=w.work_id
    group by s.subject ) x
WHERE RANKing <= 10;
```

10) Identify the museums which are open ON both Sunday and MONday. Display museum name, city.

```
SELECT distinct m.name as museum_name, m.city, m.state, m.COUNTRY
FROM museum_hours mh
JOIN museum m ON m.museum_id=mh.museum_id
WHERE day='Sunday'
and exists (SELECT 1 FROM museum_hours mh2
            WHERE mh2.museum_id=mh.museum_id
            and mh2.day='MONday');
```

11) How many museums are open every single day?

```
SELECT COUNT(1)
FROM (SELECT museum_id, COUNT(1)
      FROM museum_hours
      group by museum_id
      having COUNT(1) = 7) x;
```

12) Which are the top 5 most popular museum? (Popularity is defined based ON most no of paintings in a museum)

```

SELECT m.name as museum, m.city,m.COUNTry,x.no_of_painintgs
FROM ( SELECT m.museum_id, COUNT(1) as no_of_painintgs
      , RANK() OVER(ORDER by COUNT(1) desc) as rnk
      FROM work w
      JOIN museum m ON m.museum_id=w.museum_id
      group by m.museum_id) x
JOIN museum m ON m.museum_id=x.museum_id
WHERE x.rnk<=5;

```

13) Who are the top 5 most popular artist? (Popularity is defined based ON most no of paintings dONE by an artist)

```

SELECT a.full_name as artist, a.natiONality,x.no_of_painintgs
FROM ( SELECT a.artist_id, COUNT(1) as no_of_painintgs
      , RANK() OVER(ORDER by COUNT(1) desc) as rnk
      FROM work w
      JOIN artist a ON a.artist_id=w.artist_id
      group by a.artist_id) x
JOIN artist a ON a.artist_id=x.artist_id
WHERE x.rnk<=5;

```

14) Display the 3 least popular canva sizes

```

SELECT label,RANKing,no_of_paintings
FROM (
      SELECT cs.size_id,cs.label,COUNT(1) as no_of_paintings
      , dense_RANK() OVER(ORDER by COUNT(1) ) as RANKing
      FROM work w
      JOIN product_size ps ON ps.work_id=w.work_id
      JOIN canvas_size cs ON cs.size_id::text = ps.size_id
      group by cs.size_id,cs.label) x
WHERE x.RANKing<=3;

```

15) Which museum is open for the lONgest during a day. Dispay museum name, state and hours open and which day?

```

SELECT museum_name,state as city,day, open, close, duratiON
FROM ( SELECT m.name as museum_name, m.state, day, open, close
      , to_timestamp(open,'HH:MI AM')
      , to_timestamp(close,'HH:MI PM')
      , to_timestamp(close,'HH:MI PM') - to_timestamp(open,'HH:MI AM') as
duration
      , RANK() OVER (ORDER by (to_timestamp(close,'HH:MI PM') -
to_timestamp(open,'HH:MI AM')) desc) as rnk
      FROM museum_hours mh
      JOIN museum m ON m.museum_id=mh.museum_id) x
WHERE x.rnk=1;

```

16) Which museum has the most no of most popular painting style?

```
with pop_style as
    (SELECT style
     ,RANK() OVER(ORDER by COUNT(1) desc) as rnk
     FROM work
     group by style),
cte as
    (SELECT w.museum_id,m.name as museum_name,ps.style, COUNT(1) as
no_of_paintings
     ,RANK() OVER(ORDER by COUNT(1) desc) as rnk
     FROM work w
     JOIN museum m ON m.museum_id=w.museum_id
     JOIN pop_style ps ON ps.style = w.style
     WHERE w.museum_id is not null
     and ps.rnk=1
     group by w.museum_id, m.name,ps.style)
SELECT museum_name,style,no_of_paintings
FROM cte
WHERE rnk=1;
```

17) Identify the artists whose paintings are displayed in multiple countries

```
with cte as
    (SELECT distinct a.full_name as artist
     --, w.name as painting, m.name as museum
     , m.COUNTry
     FROM work w
     JOIN artist a ON a.artist_id=w.artist_id
     JOIN museum m ON m.museum_id=w.museum_id)
SELECT artist,COUNT(1) as no_of_COUNTRIES
FROM cte
group by artist
having COUNT(1)>1
ORDER by 2 desc;
```

18) Display the country and the city with most no of museums. Output 2 seperate columns to mentiON the city and country. If there are multiple value, seperate them with comma.

```
with cte_COUNTry as
    (SELECT COUNTry, COUNT(1)
     , RANK() OVER(ORDER by COUNT(1) desc) as rnk
     FROM museum
     group by COUNTry),
cte_city as
    (SELECT city, COUNT(1)
     , RANK() OVER(ORDER by COUNT(1) desc) as rnk
     FROM museum
```

```

        group by city)
SELECT string_agg(distinct COUNTry.COUNTry,' '), string_agg(city.city,' ')
FROM cte_COUNTry COUNTry
cross JOIN cte_city city
WHERE COUNTry.rnk = 1
and city.rnk = 1;

```

19) Identify the artist and the museum WHERE the most expensive and least expensive painting is placed.

Display the artist name, sale_price, painting name, museum name, museum city and canvas label

```

with cte as
    (SELECT *
      , RANK() OVER(ORDER by sale_price desc) as rnk
      , RANK() OVER(ORDER by sale_price ) as rnk_asc
    FROM product_size )
SELECT w.name as painting
, cte.sale_price
, a.full_name as artist
, m.name as museum, m.city
, cz.label as canvas
FROM cte
JOIN work w ON w.work_id=cte.work_id
JOIN museum m ON m.museum_id=w.museum_id
JOIN artist a ON a.artist_id=w.artist_id
JOIN canvas_size cz ON cz.size_id = cte.size_id::NUMERIC
WHERE rnk=1 or rnk_asc=1;

```

20) Which COUNTry has the 5th highest no of paintings?

```

with cte as
    (SELECT m.COUNTry, COUNT(1) as no_of_Paintings
      , RANK() OVER(ORDER by COUNT(1) desc) as rnk
    FROM work w
    JOIN museum m ON m.museum_id=w.museum_id
    group by m.COUNTry)
SELECT COUNTry, no_of_Paintings
FROM cte
WHERE rnk=5;

```

21) Which are the 3 most popular and 3 least popular painting styles?

```

with cte as
    (SELECT style, COUNT(1) as cnt
      , RANK() OVER(ORDER by COUNT(1) desc) rnk
      , COUNT(1) OVER() as no_of_records
    FROM work
    WHERE style is not null

```

```

        group by style)
SELECT style
, case when rnk <=3 then 'Most Popular' else 'Least Popular' end as remarks
FROM cte
WHERE rnk <=3
or rnk > no_of_records - 3;

```

22) Which artist has the most no of Portraits paintings outside USA?. Display artist name, no of paintings and the artist nationality.

```

SELECT full_name as artist_name, natiONality, no_of_paintings
FROM (
    SELECT a.full_name, a.nationality
    ,COUNT(1) as no_of_paintings
    ,RANK() OVER(ORDER by COUNT(1) desc) as rnk
    FROM work w
    JOIN artist a ON a.artist_id=w.artist_id
    JOIN subject s ON s.work_id=w.work_id
    JOIN museum m ON m.museum_id=w.museum_id
    WHERE s.subject='Portraits'
    and m.country != 'USA'
    group by a.full_name, a.nationality) x
WHERE rnk=1;

```