

CODING CHALLENGE

1. Retrieve the names of all artists along with the number of artworks they have in the gallery, and list them in descending order of the number of artworks.

```
mysql> SELECT
->     a.Name AS ArtistName,
->     COUNT(aw.ArtworkID) AS NumberOfArtworks
-> FROM
->     Artists a
-> LEFT JOIN
->     Artworks aw ON a.ArtistID = aw.ArtistID
-> GROUP BY
->     a.ArtistID, a.Name
-> ORDER BY
->     NumberOfArtworks DESC;
+-----+-----+
| ArtistName | NumberOfArtworks |
+-----+-----+
| Pablo Picasso | 1 |
| Vincent van Gogh | 1 |
| Leonardo da Vinci | 1 |
+-----+-----+
3 rows in set (0.00 sec)
```

2. List the titles of artworks created by artists from 'Spanish' and 'Dutch' nationalities, and order them by the year in ascending order.

```
mysql> select
->     aw.title,
->     a.nationality,
->     aw.year
-> from
->     artworks aw
-> join
->     artists a on aw.artistid = a.artistid
-> where
->     a.nationality in('spanish','dutch')
-> order by
->     aw.year asc;
+-----+-----+-----+
| title | nationality | year |
+-----+-----+-----+
| Starry Night | Dutch | 1889 |
| Guernica | Spanish | 1937 |
+-----+-----+-----+
2 rows in set (0.00 sec)
```

3. Find the names of all artists who have artworks in the 'Painting' category, and the number of artworks they have in this category.

```
mysql> select
->     a.name as artistname,
->     count(aw.artworkid) as paintingcount
-> from
->     artists a
-> join
->     artworks aw on a.artistid = aw.artistid
-> join
->     categories c on aw.categoryid = c.categoryid
-> where
->     c.name = 'painting'
-> group by
->     a.name;
+-----+-----+
| artistname | paintingcount |
+-----+-----+
| Vincent van Gogh | 1 |
| Leonardo da Vinci | 1 |
| Pablo Picasso | 1 |
+-----+-----+
3 rows in set (0.01 sec)
```

4. List the names of artworks from the 'Modern Art Masterpieces' exhibition, along with their artists and categories.

```
mysql> select
->     aw.title as artworktitle,
->     ar.name as artistname,
->     c.name as categoryname
-> from
->     exhibitionartworks ea
-> join
->     exhibitions e on ea.exhibitionid = e.exhibitionid
-> join
->     artworks aw on ea.artworkid = aw.artworkid
-> join
->     artists ar on aw.artistid = ar.artistid
-> join
->     categories c on aw.categoryid = c.categoryid
-> where
->     e.title = 'Modern Art Masterpieces';
+-----+-----+-----+
| artworktitle | artistname | categoryname |
+-----+-----+-----+
| Starry Night | Vincent van Gogh | Painting |
| Mona Lisa | Leonardo da Vinci | Painting |
| Guernica | Pablo Picasso | Painting |
+-----+-----+-----+
3 rows in set (0.00 sec)
```

5. Find the artists who have more than two artworks in the gallery.

```
mysql> select
->     a.name AS artistname,
->     count(aw.artworkID) as totalartworks
-> from
->     artists a
-> join
->     artworks aw ON a.artistid = aw.artistid
-> group by
->     a.artistid, a.name
-> having
->     count(aw.artworkid) > 2;
+-----+-----+
| artistname | totalartworks |
+-----+-----+
| Pablo Picasso |          3 |
+-----+-----+
1 row in set (0.00 sec)
```

6. Find the titles of artworks that were exhibited in both 'Modern Art Masterpieces' and 'Renaissance Art' exhibitions

```
mysql> select
->     aw.title
-> from
->     artworks aw
-> join
->     exhibitionartworks ea1 on aw.artworkid = ea1.artworkid
-> join
->     exhibitions e1 on ea1.exhibitionid = e1.exhibitionid
-> where
->     e1.title = 'modern art masterpieces'
->     and aw.artworkid in (
->         select
->             ea2.artworkid
->         from
->             exhibitionartworks ea2
->         join
->             exhibitions e2 on ea2.exhibitionid = e2.exhibitionid
->         where
->             e2.title = 'renaissance art'
-> );
+-----+
| title |
+-----+
| Mona Lisa |
+-----+
1 row in set (0.00 sec)
```

7. Find the total number of artworks in each category

```
mysql> select
->     c.name as categoryname,
->     count(a.artworkid) as totalartworks
-> from
->     categories c
-> left join
->     artworks a on c.categoryid = a.categoryid
-> group by
->     c.categoryid, c.name;
+-----+-----+
| categoryname | totalartworks |
+-----+-----+
| Painting    |             6 |
| Sculpture   |             0 |
| Photography  |             0 |
+-----+-----+
3 rows in set (0.00 sec)
```

8. List artists who have more than 3 artworks in the gallery.

```
mysql> select
->     a.name as artistname,
->     ap.totalartworks
-> from
->     artists a
-> join (
->     select
->         artistid,
->         count(artworkid) as totalartworks
->     from
->         artworks
->     group by
->         artistid
->     having count(artworkid) > 3
-> ) ap on a.artistid = ap.artistid;
+-----+-----+
| artistname   | totalartworks |
+-----+-----+
| Pablo Picasso |             4 |
+-----+-----+
1 row in set (0.00 sec)
```

9. Find the artworks created by artists from a specific nationality (e.g., Spanish).

```
mysql> select
->     aw.title as artworktitle,
->     a.name as artistname,
->     a.nationality
-> from
->     artworks aw
-> join
->     artists a on aw.artistid = a.artistid
-> where
->     a.nationality = 'spanish';
```

artworktitle	artistname	nationality
Guernica	Pablo Picasso	Spanish
The Weeping Woman	Pablo Picasso	Spanish
Les Demoiselles d'Avignon	Pablo Picasso	Spanish
Girl before a Mirror	Pablo Picasso	Spanish

4 rows in set (0.00 sec)

10. List exhibitions that feature artwork by both Vincent van Gogh and Leonardo da Vinci.

```
mysql> select
->     e.title as exhibitiontitle
-> from
->     exhibitions e
-> join
->     exhibitionartworks ea on e.exhibitionid = ea.exhibitionid
-> join
->     artworks aw on ea.artworkid = aw.artworkid
-> join
->     artists a on aw.artistid = a.artistid
-> where
->     a.artistid in (2, 3)
-> group by
->     e.exhibitionid, e.title
-> having
->     count(distinct a.artistid) = 2;
```

exhibitiontitle
Modern Art Masterpieces

1 row in set (0.00 sec)

11. Find all the artworks that have not been included in any exhibition.

```
mysql> select
->     aw.artworkid,
->     aw.title,
->     a.name as artistname
-> from
->     artworks aw
-> join
->     artists a on aw.artistid = a.artistid
-> left join
->     exhibitionartworks ea on aw.artworkid = ea.artworkid
-> where
->     ea.exhibitionid is null;
```

artworkid	title	artistname
4	The Weeping Woman	Pablo Picasso
5	Les Demoiselles d'Avignon	Pablo Picasso
7	Girl before a Mirror	Pablo Picasso
6	Irises	Vincent van Gogh

4 rows in set (0.00 sec)

12. List artists who have created artworks in all available categories.

```
mysql> select
->     a.artistid,
->     a.name as artistname
-> from
->     artists a
-> join
->     artworks aw on a.artistid = aw.artistid
-> group by
->     a.artistid, a.name
-> having
->     count(distinct aw.categoryid) = (
->         select count(*) from categories
->     );
```

artistid	artistname
3	Leonardo da Vinci

1 row in set (0.00 sec)

13. List the total number of artworks in each category.

```
mysql> select
->     c.name as categoryname,
->     count(a.artworkid) as totalartworks
-> from
->     categories c
-> left join
->     artworks a on c.categoryid = a.categoryid
-> group by
->     c.categoryid, c.name;
+-----+-----+
| categoryname | totalartworks |
+-----+-----+
| Painting    | 7             |
| Sculpture   | 1             |
| Photography  | 1             |
+-----+-----+
3 rows in set (0.00 sec)
```

14. Find the artists who have more than 2 artworks in the gallery.

```
mysql> select
->     a.artistid,
->     a.name as artistname,
->     count(aw.artworkid) as artworkcount
-> from
->     artists a
-> join
->     artworks aw on a.artistid = aw.artistid
-> group by
->     a.artistid, a.name
-> having
->     count(aw.artworkid) > 2;
+-----+-----+-----+
| artistid | artistname      | artworkcount |
+-----+-----+-----+
| 1        | Pablo Picasso   | 4            |
| 3        | Leonardo da Vinci | 3            |
+-----+-----+-----+
2 rows in set (0.00 sec)
```

15. List the categories with the average year of artworks they contain, only for categories with more than 1 artwork.

```
mysql> select
->     c.name as categoryname,
->     avg(a.year) as averageyear,
->     count(a.artworkid) as artworkcount
-> from
->     categories c
-> join
->     artworks a on c.categoryid = a.categoryid
-> group by
->     c.categoryid, c.name
-> having
->     count(a.artworkid) > 1;
+-----+-----+-----+
| categoryname | averageyear | artworkcount |
+-----+-----+-----+
| Painting    | 1856.2857   | 7            |
+-----+-----+-----+
1 row in set (0.00 sec)
```

16. Find the artworks that were exhibited in the 'Modern Art Masterpieces' exhibition.

```
mysql> select
->     aw.artworkid,
->     aw.title as artworktitle,
->     ar.name as artistname,
->     c.name as categoryname
-> from
->     exhibitions e
-> join
->     exhibitionartworks ea on e.exhibitionid = ea.exhibitionid
-> join
->     artworks aw on ea.artworkid = aw.artworkid
-> join
->     artists ar on aw.artistid = ar.artistid
-> join
->     categories c on aw.categoryid = c.categoryid
-> where
->     e.title = 'modern art masterpieces';
+-----+-----+-----+-----+
| artworkid | artworktitle | artistname      | categoryname |
+-----+-----+-----+-----+
| 3         | Guernica     | Pablo Picasso   | Painting     |
| 1         | Starry Night | Vincent van Gogh | Painting     |
| 2         | Mona Lisa    | Leonardo da Vinci | Painting     |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)
```


17. Find the categories where the average year of artworks is greater than the average year of all artworks.

```
mysql> select
->     c.name as categoryname,
->     avg(a.year) as categoryavgyear
-> from
->     categories c
-> join
->     artworks a on c.categoryid = a.categoryid
-> group by
->     c.categoryid, c.name
-> having
->     avg(a.year) > (
->         select avg(year) from artworks
->     );
```

categoryname	categoryavgyear
Painting	1856.2857
Photography	1848.0000

2 rows in set (0.00 sec)

18. List the artworks that were not exhibited in any exhibition.

```
mysql> select
->     a.artworkid,
->     a.title as artworktitle,
->     ar.name as artistname,
->     c.name as categoryname
-> from
->     artworks a
-> join
->     artists ar on a.artistid = ar.artistid
-> join
->     categories c on a.categoryid = c.categoryid
-> left join
->     exhibitionartworks ea on a.artworkid = ea.artworkid
-> where
->     ea.exhibitionid is null;
```

artworkid	artworktitle	artistname	categoryname
4	The Weeping Woman	Pablo Picasso	Painting
5	Les Demoiselles d'Avignon	Pablo Picasso	Painting
7	Girl before a Mirror	Pablo Picasso	Painting
15	Digital Horizon	Pablo Picasso	Photography
6	Irises	Vincent van Gogh	Painting
14	Urban Light	Vincent van Gogh	Photography
12	Vitruvian Man Sculpture	Leonardo da Vinci	Sculpture
13	Renaissance Shadows	Leonardo da Vinci	Photography

8 rows in set (0.00 sec)

19. Show artists who have artworks in the same category as "Mona Lisa."

```
mysql> select distinct
->     ar.artistid,
->     ar.name as artistname
-> from
->     artists ar
-> join
->     artworks aw on ar.artistid = aw.artistid
-> where
->     aw.categoryid = (
->         select categoryid
->         from artworks
->         where title = 'mona lisa'
->         limit 1
->     );
```

artistid	artistname
1	Pablo Picasso
2	Vincent van Gogh
3	Leonardo da Vinci

3 rows in set (0.00 sec)

20. List the names of artists and the number of artworks they have in the gallery.

```
mysql> select
->     ar.artistid,
->     ar.name as artistname,
->     count(aw.artworkid) as numberofartworks
-> from
->     artists ar
-> left join
->     artworks aw on ar.artistid = aw.artistid
-> group by
->     ar.artistid, ar.name;
```

artistid	artistname	numberofartworks
1	Pablo Picasso	5
2	Vincent van Gogh	3
3	Leonardo da Vinci	3

3 rows in set (0.00 sec)