

Coding Challenge 5

Virtual Art Gallery

Table creation:

```
1 -- coding challenge 5_virtual art
2
3 -- create database virtual_art_gallery
4
5 -- use virtual_art_gallery
6
7 -- create table artists
8
9 -- artists (id INT PRIMARY KEY, name VARCHAR(255) NOT NULL, biography TEXT,
10 -- nationality VARCHAR(255))
11
12 -- create table categories
13
14 -- categories (categoryID INT PRIMARY KEY,
15 -- name VARCHAR(100) NOT NULL)
16
17 -- create table artworks
18
19 -- artworks (artworkID INT PRIMARY KEY,
20 -- title VARCHAR(255) NOT NULL,
21 -- artistID INT,
22 -- categoryID INT,
23 -- year INT,
24 -- description TEXT,
25 -- imageURL VARCHAR(255))
26 -- foreign key (artworkID) references artworks (artworkID),
27 -- foreign key (categoryID) references categories (categoryID)
28
29 -- create table exhibitions
30
31 -- exhibitions (exhibitionID INT PRIMARY KEY,
32 -- title VARCHAR(255) NOT NULL,
33 -- startDate DATE,
34 -- endDate DATE,
35 -- description TEXT)
36
37 -- create table exhibitionArtworks
38
39 -- exhibitionArtworks (exhibitionID INT,
40 -- artworkID INT,
41 -- foreign key (exhibitionID) references exhibitions (exhibitionID),
42 -- foreign key (artworkID) references artworks (artworkID))
```

Data insertion

```
1
2
3 -- INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES
4
5 -- (1, 'Pablo Picasso', 'Renowned Spanish painter and sculptor', 'Spanish'),
6 -- (2, 'Vincent van Gogh', 'Dutch post-impressionist painter', 'Dutch'),
7 -- (3, 'Leonardo da Vinci', 'Italian polymath of the Renaissance', 'Italian')
8
9 -- INSERT INTO Categories (CategoryID, Name) VALUES
10
11 -- (1, 'Painting'),
12 -- (2, 'Sculpture'),
13 -- (3, 'Photography')
14
15 -- INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES
16
17 -- (1, 'Olympia', 1, 1, 1865, 'A famous painting by French van Gogh', 'olympia.jpg'),
18 -- (2, 'Mona Lisa', 2, 1, 1503, 'The iconic portrait by Leonardo da Vinci', 'mona_lisa.jpg'),
19 -- (3, 'Mona Lisa', 2, 1, 2021, 'Pablo Picasso's daughter and son-in-law', 'picasso.jpg')
20
21 -- INSERT INTO Exhibitions (ExhibitionID, Title, StartDate, EndDate, Description) VALUES
22
23 -- (1, 'Modern Art Masterpieces', '2021-01-01', '2021-01-31', 'A collection of master art masterpieces'),
24 -- (2, 'Renaissance Art', '2021-02-01', '2021-02-28', 'A showcase of Renaissance art treasures')
25
26 -- INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES
27
28 -- (1, 1),
29 -- (1, 2),
30 -- (1, 3),
31 -- (2, 1)
```

Output

Output			
Action Output			
#	Time	Action	Message
1	12:36:29	Create database Virtual_Art_Gallery	1 row(s) affected
2	12:36:44	use Virtual_Art_Gallery	0 row(s) affected
3	12:40:59	CREATE TABLE Artists (ArtistID INT PRIMARY KEY, Name VARCHAR(255) NOT NULL, Biography TEXT, Na...	0 row(s) affected
4	12:41:10	CREATE TABLE Categories (CategoryID INT PRIMARY KEY, Name VARCHAR(100) NOT NULL)	0 row(s) affected
5	12:41:34	CREATE TABLE Artworks (ArtworkID INT PRIMARY KEY, Title VARCHAR(255) NOT NULL, ArtistID INT, Cat...	0 row(s) affected
6	12:41:44	CREATE TABLE Exhibitions (ExhibitionID INT PRIMARY KEY, Title VARCHAR(255) NOT NULL, StartDate DA...	0 row(s) affected
7	12:42:04	CREATE TABLE ExhibitionArtworks (ExhibitionID INT, ArtworkID INT, PRIMARY KEY (ExhibitionID, ArtworkID...	0 row(s) affected
8	12:42:13	INSERT INTO Artists (ArtistID, Name, Biography, Nationality) VALUES (1, 'Pablo Picasso', 'Renowned Spanish p...	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0
9	12:42:20	INSERT INTO Categories (CategoryID, Name) VALUES (1, 'Painting'), (2, 'Sculpture'), (3, 'Photography')	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0
10	12:42:40	INSERT INTO Artworks (ArtworkID, Title, ArtistID, CategoryID, Year, Description, ImageURL) VALUES (1, 'Skysc...	3 row(s) affected Records: 3 Duplicates: 0 Warnings: 0
11	12:42:46	INSERT INTO Exhibitions (ExhibitionID, Title, StartDate, EndDate, Description) VALUES (1, 'Modern Art Masterp...	2 row(s) affected Records: 2 Duplicates: 0 Warnings: 0
12	12:42:52	INSERT INTO ExhibitionArtworks (ExhibitionID, ArtworkID) VALUES (1, 1), (1, 2), (1, 3), (2, 2)	4 row(s) affected Records: 4 Duplicates: 0 Warnings: 0

Queries:

1.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
64
65 /*1*/
66 * SELECT A.Name AS ArtistName, COUNT(*) AS ArtworkCount
67 FROM Artists A
68 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
69 GROUP BY A.Name
70 ORDER BY ArtworkCount DESC;
71
```

The Results pane displays the following data:

ArtistName	ArtworkCount
Pablo Picasso	3
Vincent van Gogh	1
Leonardo da Vinci	1

The Output pane shows the execution message:

```
1 12:49:31 SELECT A.Name AS ArtistName, COUNT(*) AS ArtworkCount FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID ... 3 row(s) returned
Duration: 0.000 sec / 0.000 sec
```

2.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
71
72 /*2*/
73 * SELECT AW.Title
74 FROM Artists A
75 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
76 WHERE A.Nationality IN ('Spanish', 'Dutch')
77 ORDER BY AW.Year;
78
```

The Results pane displays the following data:

Title
Starry Night
Guernica

The Output pane shows the execution message:

```
1 12:50:55 SELECT AW.Title FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID WHERE A.Nationality IN ('Spanish', 'Dutch') ... 2 row(s) returned
Duration: 0.000 sec / 0.000 sec
```

3.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
78  
79 /*3*/  
80 * SELECT A.Name AS ArtistName, COUNT(*) AS ArtworkCount  
81 FROM Artists A  
82 JOIN Artworks AW ON A.ArtistID = AW.ArtistID  
83 WHERE AW.CategoryID = (SELECT CategoryID FROM Categories WHERE Name = 'Painting')  
84 GROUP BY A.Name;  
85
```

The Results grid shows the following data:

ArtistName	ArtworkCount
Pablo Picasso	1
Vincent van Gogh	1
Leonardo da Vinci	1

The Output pane shows the execution message:

```
1 12:50:36 SELECT A.Name AS ArtistName, COUNT(*) AS ArtworkCount FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID WHERE AW.CategoryID = (SELECT CategoryID FROM Categories WHERE Name = 'Painting') GROUP BY A.Name; 3 row(s) returned
```

4.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
86 /*4*/  
87 * SELECT AW.Title, A.Name AS ArtistName, C.Name AS CategoryName  
88 FROM Artworks AW  
89 JOIN Artists A ON AW.ArtistID = A.ArtistID  
90 JOIN Categories C ON AW.CategoryID = C.CategoryID  
91 JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID  
92 JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID  
93 WHERE E.Title = 'Modern Art Masterpieces';
```

The Results grid shows the following data:

Title	ArtistName	CategoryName
Starry Night	Vincent van Gogh	Painting
Mona Lisa	Leonardo da Vinci	Painting
Guernica	Pablo Picasso	Painting

The Output pane shows the execution message:

```
1 12:51:03 SELECT AW.Title, A.Name AS ArtistName, C.Name AS CategoryName FROM Artworks AW JOIN Artists A ON AW.ArtistID = A.ArtistID JOIN Categories C ON AW.CategoryID = C.CategoryID JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID WHERE E.Title = 'Modern Art Masterpieces'; 3 row(s) returned
```

5.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
95
96 /*5*/
97 * SELECT A.Name AS ArtistName
98 FROM Artists A
99 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
100 GROUP BY A.Name
101 HAVING COUNT(*) > 2;
102
```

The Results grid shows a single column named 'ArtistName'. The Output pane at the bottom displays the execution message:

Time	Action	Message	Duration / Fetch
12:51:33	SELECT A.Name AS ArtistName FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID GROUP BY A.Name HAVING COUNT(*) > 2;	3 row(s) returned	0.000 sec / 0.000 sec

6.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
103 /*6*/
104 * SELECT AW.Title
105 FROM Artworks AW
106 JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID
107 JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID
108 WHERE E.Title IN ('Modern Art Masterpieces', 'Renaissance Art')
109 GROUP BY AW.Title
110 HAVING COUNT(DISTINCT E.Title) = 2;
```

The Results grid shows a single column named 'Title'. The Output pane at the bottom displays the execution message:

Time	Action	Message	Duration / Fetch
12:52:06	SELECT AW.Title FROM Artworks AW JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID WHERE E.Title IN ('Modern Art Masterpieces', 'Renaissance Art') GROUP BY AW.Title HAVING COUNT(DISTINCT E.Title) = 2;	1 row(s) returned	0.000 sec / 0.000 sec

7.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
111
112 /*?*/
113 * SELECT C.Name AS CategoryName, COUNT(*) AS ArtworkCount
114 FROM Artworks AW
115 JOIN Categories C ON AW.CategoryID = C.CategoryID
116 GROUP BY C.Name;
117
118
```

The Results pane shows a single row of data:

CategoryName	ArtworkCount
Painting	3

The Output pane shows the execution details:

Time	Action	Message	Duration / Fetch
1 12:52:34	SELECT C.Name AS CategoryName, COUNT(*) AS ArtworkCount FROM Artworks AW JOIN Categories C ON A...	1 row(s) returned	0.000 sec / 0.000 sec

8.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
117
118 /*?*/
119 * SELECT A.Name AS ArtistName
120 FROM Artists A
121 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
122 GROUP BY A.Name
123 HAVING COUNT(*) > 3;
124
```

The Results pane shows a single row of data:

ArtistName
...

The Output pane shows the execution details:

Time	Action	Message	Duration / Fetch
1 12:53:15	SELECT A.Name AS ArtistName FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID GROUP BY A...	3 row(s) returned	0.000 sec / 0.000 sec

9.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor at the top contains the following SQL code:

```

124
125 /*9*/
126 * SELECT AW.Title
127 FROM Artists A
128 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
129 WHERE A.Nationality = 'Spanish';
130
131

```

Below the query editor, the 'Results' pane shows a single row of data:

Title
Guernica

The 'Output' pane at the bottom shows the execution message:

```

1 12:53:56 SELECT AW Title FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID WHERE A.Nationality = 'Span...
1 row(s) returned

```

The duration of the query execution is 0.000 sec / 0.000 sec.

10.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor at the top contains the following SQL code:

```

132 /*10*/
133 * SELECT E.Title
134 FROM Exhibitions E
135 JOIN ExhibitionArtworks EA ON E.ExhibitionID = EA.ExhibitionID
136 JOIN Artworks AW ON EA.ArtworkID = AW.ArtworkID
137 JOIN Artists A ON AW.ArtistID = A.ArtistID
138 WHERE A.Name IN ('Vincent van Gogh', 'Leonardo da Vinci')
139 GROUP BY E.Title
140 HAVING COUNT(DISTINCT A.Name) = 2;

```

Below the query editor, the 'Results' pane shows a single row of data:

Title
Modern Art Masterpieces

The 'Output' pane at the bottom shows the execution message:

```

1 12:54:29 SELECT E Title FROM Exhibitions E JOIN ExhibitionArtworks EA ON E.ExhibitionID = EA.ExhibitionID JOIN Art...
1 row(s) returned

```

The duration of the query execution is 0.000 sec / 0.000 sec.

11.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
141
142 /*11*/
143 * SELECT AW.Title
144 FROM Artworks AW
145 LEFT JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID
146 WHERE EA.ExhibitionID IS NULL;
147
148
```

The Results pane shows a single column named 'Title'. The Output pane shows the execution message:

#	Time	Action	Message	Duration / Fetch
1	12:54:39	SELECT AW Title FROM Artworks AW LEFT JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID W...	Row(s) returned	0.000 sec / 0.000 sec

12.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
147
148 /*12*/
149 * SELECT A.Name AS ArtistName
150 FROM Artists A
151 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
152 GROUP BY A.Name
153 HAVING COUNT(DISTINCT AW.CategoryID) = (SELECT COUNT(*) FROM Categories);
154
```

The Results pane shows a single column named 'ArtistName'. The Output pane shows the execution message:

#	Time	Action	Message	Duration / Fetch
1	12:55:32	SELECT A.Name AS ArtistName FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID GROUP BY A...	Row(s) returned	0.003 sec / 0.000 sec

13.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
155
156
157 /*13*/
158 * SELECT C.Name AS CategoryName, COUNT(*) AS ArtworkCount
159 FROM Artworks AW
160 JOIN Categories C ON AW.CategoryID = C.CategoryID
161 GROUP BY C.Name;
162
```

The Results grid shows the following data:

CategoryName	ArtworkCount
Painting	3

The Output pane shows the execution message:

```
1 12:56:03 SELECT C.Name AS CategoryName, COUNT(*) AS ArtworkCount FROM Artworks AW JOIN Categories C ON A...
1 row(s) returned
0.000 sec / 0.000 sec
```

14.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor contains the following SQL code:

```
164
165 /*14*/
166 * SELECT A.Name AS ArtistName
167 FROM Artists A
168 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
169 GROUP BY A.Name
170 HAVING COUNT(*) > 2;
171
```

The Results grid shows the following data:

ArtistName

The Output pane shows the execution message:

```
1 12:57:11 SELECT A.Name AS ArtistName FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID GROUP BY A...
0 row(s) returned
0.000 sec / 0.000 sec
```


15.

The screenshot shows a SQL IDE window with a query editor and a results pane. The query is as follows:

```

172
173 /*15*/
174 * SELECT C.Name AS CategoryName, AVG(AW.Year) AS AvgYear
175 FROM Artworks AW
176 JOIN Categories C ON AW.CategoryID = C.CategoryID
177 GROUP BY C.Name
178 HAVING COUNT(*) > 1;
179

```

The results pane displays a single row:

CategoryName	AvgYear
Painting	1776.3333

The output pane shows the execution details:

```

1 12:57:45 SELECT C.Name AS CategoryName, AVG(AW.Year) AS AvgYear FROM Artworks AW JOIN Categories C ON A...
1 row(s) returned
0.000 sec / 0.000 sec

```

16.

The screenshot shows a SQL IDE window with a query editor and a results pane. The query is as follows:

```

179
180 /*16*/
181 * SELECT AW.Title
182 FROM Artworks AW
183 JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID
184 JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID
185 WHERE E.Title = 'Modern Art Masterpieces';
186

```

The results pane displays three rows:

Title
Starry Night
Home Life
Guernica

The output pane shows the execution details:

```

1 12:58:13 SELECT AW.Title FROM Artworks AW JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID JOIN Exhibitions E ON EA.ExhibitionID = E.ExhibitionID WHERE E.Title = 'Modern Art Masterpieces';
3 row(s) returned
0.000 sec / 0.000 sec

```

17.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor displays the following SQL code:

```
186  
187 /*17*/  
188 * SELECT C.Name AS CategoryName  
189 FROM Artworks AW  
190 JOIN Categories C ON AW.CategoryID = C.CategoryID  
191 GROUP BY C.Name  
192 HAVING AVG(AW.Year) > (SELECT AVG(Year) FROM Artworks);  
193
```

The Results pane shows a single column named "CategoryName". The Output pane shows the following message:

Time	Action	Message	Duration / Fetch
1 12:58:42	SELECT C.Name AS CategoryName FROM Artworks AW JOIN Categories C ON AW.CategoryID = C.CategoryID	0 row(s) returned	0.018 sec / 0.000 sec

18.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor displays the following SQL code:

```
193  
194 /*18*/  
195 * SELECT AW.Title  
196 FROM Artworks AW  
197 LEFT JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID  
198 WHERE EA.ExhibitionID IS NULL;  
199  
200
```

The Results pane shows a single column named "Title". The Output pane shows the following message:

Time	Action	Message	Duration / Fetch
1 12:59:11	SELECT AW Title FROM Artworks AW LEFT JOIN ExhibitionArtworks EA ON AW.ArtworkID = EA.ArtworkID W	0 row(s) returned	0.000 sec / 0.000 sec

19.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor displays the following SQL query:

```

199
200
201 /*19*/
202 * SELECT A.Name AS ArtistName, AW.Title
203 FROM Artists A
204 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
205 WHERE AW.CategoryID = (SELECT CategoryID FROM Artworks WHERE Title = 'Mona Lisa');
206

```

The Results Grid shows the following data:

ArtistName	Title
Pablo Picasso	Guernica
Vincent van Gogh	Starry Night
Leonardo da Vinci	Mona Lisa

The Output pane shows the following message:

```

1 12:59:41 SELECT A.Name AS ArtistName, AW.Title FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID WHERE AW.CategoryID = (SELECT CategoryID FROM Artworks WHERE Title = 'Mona Lisa');
3 row(s) returned
Duration: 0.000 sec / 0.000 sec

```

20.

The screenshot shows the SQL Server Enterprise Manager interface. The query editor displays the following SQL query:

```

206
207 /*20*/
208 * SELECT A.Name AS ArtistName, COUNT(*) AS ArtworkCount
209 FROM Artists A
210 JOIN Artworks AW ON A.ArtistID = AW.ArtistID
211 GROUP BY A.Name;
212
213

```

The Results Grid shows the following data:

ArtistName	ArtworkCount
Pablo Picasso	1
Vincent van Gogh	1
Leonardo da Vinci	1

The Output pane shows the following message:

```

1 13:00:10 SELECT A.Name AS ArtistName, COUNT(*) AS ArtworkCount FROM Artists A JOIN Artworks AW ON A.ArtistID = AW.ArtistID GROUP BY A.Name;
3 row(s) returned
Duration: 0.000 sec / 0.000 sec

```