

# 3

## CSDS 341 HW 3

### 0

Database setup I used:

---

```
-- Part A --
```

---

```
CREATE DATABASE ArtisticCreations;
```

```
GO
```

```
;
```

---

```
-- Part B --
```

---

```
USE ArtisticCreations;
```

```
GO
```

```
;
```

```
CREATE TABLE artist (  
    aID bigint IDENTITY(4000, 1),  
    fname varchar(255),  
    lname varchar(255) NOT NULL,  
    STATUS varchar(20) NOT NULL,  
    dob date NOT NULL,  
    CHECK (STATUS IN ('active', 'inactive')),  
    PRIMARY KEY (aID)  
);
```

```
CREATE TABLE works (  
    wID bigint IDENTITY(1500, 1),  
    name varchar(255) NOT NULL,  
    TYPE varchar(10) NOT NULL,  
    cost bigint NOT NULL,  
    STATUS varchar(10) NOT NULL,  
    CHECK (TYPE IN ('paint', 'sculpt', 'photo', 'draw')),  
    CHECK (STATUS IN ('avail', 'pend', 'sold')),  
    PRIMARY KEY (wID)  
);
```

Copy

```

CREATE TABLE artWork (
    aID bigint NOT NULL,
    wID bigint NOT NULL,
    FOREIGN KEY (aID) REFERENCES artist(aID),
    FOREIGN KEY (wID) REFERENCES works(wID),
    PRIMARY KEY (aID, wID)
);

CREATE TABLE exhibition (
    eID bigint IDENTITY(1, 1),
    name varchar(255) NOT NULL,
    venue varchar(20) NOT NULL,
    begDate date NOT NULL,
    endDate date NOT NULL,
    CHECK (venue IN ('public', 'private')),
    CHECK (endDate ≥ begDate),
    PRIMARY KEY (eID)
);

CREATE TABLE exhWork (
    eID bigint NOT NULL,
    wID bigint NOT NULL,
    FOREIGN KEY (eID) REFERENCES exhibition(eID),
    FOREIGN KEY (wID) REFERENCES works(wID),
    PRIMARY KEY (eID, wID)
);

CREATE TABLE transact (
    tID bigint IDENTITY(1, 1),
    eID bigint,
    patron varchar(255),
    wID bigint NOT NULL,
    tranDate date NOT NULL,
    paid int NOT NULL,
    STATUS varchar(20) NOT NULL,
    CHECK (STATUS IN ('refund', 'paid')),
    FOREIGN KEY (eID) REFERENCES exhibition(eID),
    FOREIGN KEY (wID) REFERENCES works(wID),
    PRIMARY KEY (tID)
);

GO
;

-- Part C --

USE ArtisticCreations;

```

```

GO
;

INSERT INTO
    artist (fname, lname, STATUS, dob)
VALUES
    ('John', 'Doe', 'active', '1990-05-15'),
    ('Jane', 'Smith', 'active', '1985-12-07'),
    ('Bob', 'Johnson', 'inactive', '1995-01-20'),
    ('Boo', 'Hoo', 'inactive', '1985-01-21'),
    ('Alice', 'Williams', 'active', '1992-09-10');

INSERT INTO
    artist (lname, STATUS, dob)
VALUES
    ('Johnson', 'active', '1980-03-12'),
    ('Smoth', 'inactive', '1998-07-25');

INSERT INTO
    works (name, TYPE, cost, STATUS)
VALUES
    ('The River', 'photo', 250000, 'avail'),
    ('The Cat', 'paint', 500000, 'sold'),
    ('Pink Sunrise', 'sculpt', 300000, 'avail'),
    ('Butterfly.', 'draw', 2000000, 'pend'),
    ('b.', 'paint', 4000000, 'avail');

INSERT INTO
    artWork (aID, wID)
SELECT
    a.aID,
    w.wID
FROM
    artist AS a,
    works AS w
WHERE
    a.lname = 'Smith'
    AND w.cost > 600000
    OR a.dob > '1990-01-01'
    AND w.type = 'paint'
    OR a.lname = 'Johnson'
    AND a.fname IS NULL
    AND w.status = 'pend'
    OR a.lname = 'Smoth'
    AND w.type = 'photo';

INSERT INTO
    exhibition (name, venue, begDate, endDate)
VALUES

```

```
(
    'Light and Shadow',
    'private',
    '2015-05-05',
    '2015-05-06'
),
(
    'The Future',
    'private',
    '2017-01-01',
    '2017-01-08'
),
('blu', 'public', '2018-02-15', '2018-02-17'),
('gren', 'private', '2018-02-16', '2018-02-18'),
('Space', 'private', '2019-03-20', '2019-03-25'),
('The Sky', 'public', '2021-04-01', '2021-04-07');
```

```
INSERT INTO
    exhWork (eID, wID)
SELECT
    e.eID,
    w.wID
FROM
    exhibition AS e,
    works AS w
WHERE
    e.name = 'Light and Shadow'
    AND w.type = 'paint'
    OR e.name = 'The Future'
    OR e.name = 'blu'
    AND w.type = 'sculpt'
    OR e.name = 'Space'
    AND w.status = 'pend'
    OR e.name = 'The Sky'
    AND w.type IN ('draw', 'paint');
```

```
INSERT INTO
    transact (eID, patron, wID, tranDate, paid, STATUS)
VALUES
    (
        NULL,
        'Alice',
        (
            SELECT
                wID
            FROM
                works
            WHERE
                name = 'The Cat'
        ),

```

```

        '2015-05-05',
        500000,
        'paid'
    ),
    (
        (
            SELECT
                eID
            FROM
                exhibition
            WHERE
                name = 'The Future'
        ),
        'Bob',
        (
            SELECT
                wID
            FROM
                works
            WHERE
                name = 'Pink Sunrise'
        ),
        '2017-01-05',
        300000,
        'paid'
    ),
    (
        (
            SELECT
                eID
            FROM
                exhibition
            WHERE
                name = 'The Future'
        ),
        'Bob',
        (
            SELECT
                wID
            FROM
                works
            WHERE
                name = 'Pink Sunrise'
        ),
        '2017-01-06',
        -300000,
        'refund'
    ),
    (
        (

```

```

        SELECT
            eID
        FROM
            exhibition
        WHERE
            name = 'The Sky'
    ),
    'Tom',
    (
        SELECT
            wID
        FROM
            works
        WHERE
            name = 'Butterfly.'
    ),
    '2021-04-07',
    2000000,
    'paid'
);

```

GO

;

# 1

## a

```
USE ArtisticCreations;
```

GO

;

```
SELECT
```

```

    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS full_name,
    w.wID AS work_id,
    w.name AS work_name,
    w.type AS work_type,
    w.cost AS work_cost,
    w.status AS work_status

```

```
FROM
```

```

    artWork AS aw
    JOIN artist AS a ON aw.aID = a.aID
    JOIN works AS w ON aw.wID = w.wID;

```

```
GO  
;
```

**b**

```
USE ArtisticCreations;  
  
GO  
;  
  
SELECT  
    a.aID AS artist_id,  
    TRIM(  
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)  
    ) AS full_name,  
    w.wID AS work_id,  
    w.name AS work_name,  
    w.type AS work_type,  
    w.cost AS work_cost,  
    w.status AS work_status  
FROM  
    artWork AS aw  
    JOIN works AS w ON aw.wID = w.wID  
    RIGHT JOIN artist AS a ON aw.aID = a.aID;  
  
GO  
;
```

**c**

```
USE ArtisticCreations;  
  
GO  
;  
  
SELECT  
    a.aID AS artist_id,  
    TRIM(  
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)  
    ) AS full_name,  
    w.wID AS work_id,  
    w.name AS work_name,  
    w.type AS work_type,  
    w.cost AS work_cost,
```

```

        w.status AS work_status
FROM
    artWork AS aw
    JOIN artist AS a ON aw.aID = a.aID
    RIGHT JOIN works AS w ON aw.wID = w.wID
ORDER BY
    full_name ASC;

GO
;

```

**d**

```

USE ArtisticCreations;

GO
;

SELECT
    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS full_name,
    w.wID AS work_id,
    w.name AS work_name,
    w.type AS work_type,
    w.cost AS work_cost,
    w.status AS work_status
FROM
    artWork AS aw
    RIGHT JOIN works AS w ON aw.wID = w.wID
    RIGHT JOIN artist AS a ON aw.aID = a.aID;

GO
;

```

**e**

```

USE ArtisticCreations;

GO
;

SELECT
    e.eID AS exhibition_id,

```



```

    e.name AS exhibition_name,
    e.begDate AS beginning_date,
    e.endDate AS ending_date,
    w.wID AS work_id,
    w.name AS work_name,
    w.type AS work_type,
    w.cost AS work_cost,
    w.status AS work_status,
    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS artist_full_name
FROM
    exhWork
    JOIN exhibition AS e ON exhWork.eID = e.eID
    JOIN works AS w ON exhWork.wID = w.wID
    LEFT JOIN artWork AS aw ON w.wID = aw.wID
    LEFT JOIN artist AS a ON aw.aID = a.aID;

GO
;

```

f

```

USE ArtisticCreations;

GO
;

SELECT
    e.eID AS exhibition_id,
    e.name AS exhibition_name,
    e.begDate AS beginning_date,
    e.endDate AS ending_date,
    w.wID AS work_id,
    w.name AS work_name,
    w.type AS work_type,
    w.cost AS work_cost,
    w.status AS work_status,
    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS artist_full_name
FROM
    exhWork
    JOIN works AS w ON exhWork.wID = w.wID
    RIGHT JOIN exhibition AS e ON exhWork.eID = e.eID

```

```
LEFT JOIN artWork AS aw ON w.wID = aw.wID
LEFT JOIN artist AS a ON aw.aID = a.aID;
```

```
GO
;
```

## g

```
USE ArtisticCreations;
```

```
GO
;
```

```
SELECT
    e.eID AS exhibition_id,
    e.name AS exhibition_name,
    e.begDate AS beginning_date,
    e.endDate AS ending_date,
    w.wID AS work_id,
    w.name AS work_name,
    w.type AS work_type,
    w.cost AS work_cost,
    w.status AS work_status,
    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS artist_full_name
```

```
FROM
    exhWork
    JOIN works AS w ON exhWork.wID = w.wID
    JOIN exhibition AS e ON exhWork.eID = e.eID
    JOIN artWork AS aw ON w.wID = aw.wID
    LEFT JOIN artist AS a ON aw.aID = a.aID
```

```
WHERE
    w.status = 'sold';
```

```
GO
;
```

## h

```
USE ArtisticCreations;
```

```
GO
;
```

```

SELECT
    e.eID AS exhibition_id,
    e.name AS exhibition_name,
    AVG(w.cost) AS avgCost
FROM
    exhWork
    JOIN works AS w ON exhWork.wID = w.wID
    JOIN exhibition AS e ON exhWork.eID = e.eID
GROUP BY
    e.eID,
    e.name;

GO
;

```

i

```

USE ArtisticCreations;

GO
;

SELECT
    e.name AS exhibition_name,
    e.begDate AS exhibition_start,
    e.endDate AS exhibition_end,
    w.name AS work_name,
    w.wID AS work_id,
    t.paid AS price_paid
FROM
    transact AS t
    JOIN works AS w ON t.wID = w.wID
    LEFT JOIN exhibition AS e ON t.eID = e.eID
WHERE
    t.paid > 500;

GO
;

```

j

```

USE ArtisticCreations;

GO

```

```

;

SELECT
    e1.eID AS id_1,
    e1.name AS name_1,
    e1.venue AS venue_1,
    e1.begDate AS begDate_1,
    e1.endDate AS endDate_1,
    e2.eID AS id_2,
    e2.name AS name_2,
    e2.venue AS venue_2,
    e2.begDate AS begDate_2,
    e2.endDate AS endDate_2
FROM
    exhibition AS e1
    JOIN exhibition AS e2 ON e2.begDate > e1.begDate
    AND e2.begDate < e1.endDate
    OR e2.endDate > e1.begDate
    AND e2.endDate < e1.endDate;

GO
;

```

## k

```

USE ArtisticCreations;

GO
;

CREATE VIEW ExhibitionsAndWorks AS
SELECT
    e.eID AS exhibition_id,
    e.name AS exhibition_name,
    e.begDate AS beginning_date,
    e.endDate AS ending_date,
    w.wID AS work_id,
    w.name AS work_name,
    w.type AS work_type,
    w.cost AS work_cost,
    w.status AS work_status,
    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS artist_full_name
FROM
    exhWork

```

```

JOIN works AS w ON exhWork.wID = w.wID
RIGHT JOIN exhibition AS e ON exhWork.eID = e.eID
LEFT JOIN artWork AS aw ON w.wID = aw.wID
LEFT JOIN artist AS a ON aw.aID = a.aID;

```

```

GO
;

```

I

i

```

USE ArtisticCreations;

GO
;

SELECT
    e.eID AS exhibition_id,
    e.name AS exhibition_name,
    AVG(w.cost) AS avgCost
FROM
    exhWork
    JOIN works AS w USING wID
    JOIN exhibition AS e USING eID
GROUP BY
    e.eID,
    e.name;

GO
;

```

ii

The `USING` statement tends to be less explicit and clear when doing merges, additionally it is not possible to `JOIN` when the column names are different across tables.

2

a

```

USE ArtisticCreations;

```

```

GO
;

SELECT
    a.aID AS artist_id,
    TRIM(
        CONCAT(COALESCE(a.fname, ''), ' ', a.lname)
    ) AS full_name
FROM
    artWork AS aw
    RIGHT JOIN artist AS a ON aw.aID = a.aID
WHERE
    aw.wID IS NULL;

GO
;

```

## b

```

USE ArtisticCreations;

GO
;

SELECT
    w.name AS work_name,
    w.wID AS work_id,
    e.eID AS exhibition_id,
    e.name AS exhibition_name
FROM
    exhibition AS e
    JOIN exhWork AS ew ON e.eID = ew.eID
    JOIN works AS w ON ew.wID = w.wID
    LEFT JOIN artWork AS aw ON w.wID = aw.wID
WHERE
    aw.aID IS NULL;

GO
;

```

## c

```

USE ArtisticCreations;

GO

```

```

;

SELECT
    e.eID AS exhibition_id,
    e.name AS exhibition_name,
    e.begDate AS exhibition_startDate,
    e.endDate AS exhibition_endDate
FROM
    exhibition AS e
    LEFT JOIN exhWork AS ew ON e.eID = ew.eID
WHERE
    ew.wID IS NULL;

GO
;

```

**d**

```

USE ArtisticCreations;

GO
;

SELECT
    w.type AS TYPE,
    COUNT(*)
FROM
    works AS w
    JOIN transact AS t ON w.wID = t.wID
    JOIN exhibition AS e ON t.eID = e.eID
WHERE
    t.status = 'paid'
GROUP BY
    w.type;

GO
;

```

**3**

**a**

**i**

The attribute ordering will be:

```
ID, name, venue, begDate, endDate, type, cost, status
```

## ii

The attribute ordering will be (when joined with `artist`):

```
ID, name, venue, begDate, endDate, type, cost, status, fname, lname,  
status, dob
```

The attribute ordering of the SQL query provided below *iii* will be (when joined with `transact`):

```
ID, name, venue, begDate, endDate, type, cost, status, eID, patron, wID,  
tranDate
```

## b

This joins all tables on their ID column (among other things), but this is mainly the issue as it is highly unlikely that you are looking for exhibitions, works, and artists that have the same id where the work has the same name as the exhibition, as this is a meaningless query.

Instead, you probably would want to match exhibitions up with works through the `exhWork` table, without natural joins, then to artists with the `artWork` table.