CS 210: Data Management for Data Science

Sample Midterm 2

Fall 2023

Name: _____ NetID: _____

This is a closed book, closed notes exam, only 5 pages of HAND WRITTEN NOTES allowed.

No electronic devices are permitted.

Name: _____

1. (10 points) Consider the table `Products`:

ProductID	ProductName	Category	Price
1	Laptop	Electronics	1200
2	Headphones	Electronics	150
3	T-shirt	Apparel	25
4	Watch	Accessories	300
5	Sneakers	Footwear	80
6	Sunglasses	Accessories	90

Write an SQL query to select **ProductName** and **Price** of products within the **Accessories** category with a price higher than 100.

```
SELECT ProductName, Price
FROM Products
WHERE Category = 'Accessories' AND Price > 100;
```

Name: _____

2. (30 points) Consider the table `Orders`:

OrderID	CustomerID	TotalAmount
1001	101	250.00
1002	102	150.00
1003	101	300.00
1004	103	500.00
1005	102	200.00
1006	101	350.00

(a) (15 points): Write an SQL query to display the orders (all columns) in descending order of `TotalAmount`.

```
SELECT *
FROM Orders
ORDER BY TotalAmount DESC;
```

(b) (15 points): Write an SQL query to display the total amount spent by each customer, showing the sum of `TotalAmount` for each customer.

```
SELECT CustomerID, SUM(TotalAmount) AS TotalSpent
FROM Orders
GROUP BY CustomerID;
```

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3. (20 points) Consider the table `Sales`:

SaleID	Product	UnitsSold
101	Monitor	50
102	Keyboard	120
103	Mouse	200
104	Headphones	80
105	Printer	30
106	Scanner	40

(a) (10 points): Write an SQL query to find the **sum** of units sold for all products.

```
SELECT SUM(UnitsSold) AS TotalUnitsSold
FROM Sales;
```

(b) (10 points): Write an SQL query to find the product which had the **lowest** number of units sold.

```
SELECT Product
FROM Sales
WHERE UnitsSold = (SELECT MIN(UnitsSold) FROM Sales);
```

Name: _____

4. (30 points) Consider the tables `Authors` and `Books`:

`Authors`:

AuthorID	AuthorName
A1	John Green
A2	J.K. Rowling
A3	Stephen King
A4	Agatha Christie

`Books`:

AuthorID	BookTitle
A1	The Fault in Our Stars
A2	Harry Potter and the Philosopher's Stone
A1	Looking for Alaska
A3	The Shining
A4	Murder on the Orient Express
A2	Harry Potter and the Chamber of Secrets

(a) (15 points): Write an SQL query to join the two tables on `AuthorID` and display the author's name with the title of their books.

```
SELECT Authors.AuthorName, Books.BookTitle
FROM Authors
INNER JOIN Books ON Authors.AuthorID = Books.AuthorID;
```

(b) (15 points): Write an SQL query to find the **names** of authors who have written a book with the word "Harry" in the title.

```
SELECT DISTINCT AuthorName
FROM Authors
INNER JOIN Books ON Authors.AuthorID = Books.AuthorID
WHERE BookTitle LIKE '%Harry%';
```

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5. (10 points) Given the following strings, which includes various employee IDs:

```
"EMP001"
"EMP01253"
"EMP105"
"USR20267"
"EMP034"
       ...
```

Write a regular expression to match strings that start with 'EMP' and are followed by exactly three digits.

```
pattern = r"^EMP\d{3}"
```

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6. (Extra Credit: 10 points) Given the table Orders:

OrderID	CustomerName	TotalAmount
1	John	150
2	Alice	75
3	Bob	50
4	Emma	120
5	Sarah	100
6	Chris	180

Write an SQL query to select orders where the 'TotalAmount' is greater than 100 or the 'CustomerName' starts with 'J', but NOT where the 'CustomerName' is 'Sarah'.

```
SELECT *
FROM Orders
WHERE (TotalAmount > 100 OR CustomerName LIKE 'J%') AND CustomerName != 'Sarah';
```

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