Business Intelligence Development Tech Internship

Duration: 2 hours

Deadline: Friday, April 4th 2025 18:00

Questions

Free text

1. What is Business Intelligence (BI), and why is it important for organizations?

2. Can you discuss the advantages and disadvantages of using cloud-based BI solutions versus on-premises solutions?

3. Can you explain the difference between structured and unstructured data?

4. What are some common BI tools you are familiar or heard about?

5. What is ETL, and why is it important in BI?

Multiple choice

1. Which of the following is a primary goal of Business Intelligence?
    a. To automate business processes
    b. To eliminate all manual reporting processes
    c. To provide actionable insights for strategic decision-making
    d. Reduce data storage

2. What is a data warehouse?
    a. A type of software for data visualization
    b. A central repository for storing data
    c. A tool for data entry
    d. A database for transactional data

3. Which of the following is not a component of a BI solution?
    a. Data sources
    b. Data integration tools
    c. Data storage
    d. Social media marketing

4. What is the purpose of ETL in BI?

a. Extract, Transform, Load
b. Evaluate, Test, Launch
c. Enter, Track, Log
d. Export, Transfer, Link

5. What is a common challenge when implementing a BI solution?

a. Lack of data sources
b. Data quality issues
c. Excessive data storage
d. Overly simple reports

6. What does DAX stand for in the context of Business Intelligence?

a. Data Analysis Expressions
b. Data Aggregation Extensions
c. Dynamic Analysis of XML
d. Data Access and Exchange

7. What is data mining?

a. The process of storing data
b. The process of analyzing data to discover patterns
c. The process of deleting unnecessary data
d. The process of entering data into a database

8. Which of the following best describes a dashboard in BI?

a. A tool for data entry
b. A visual display of key metrics and data
c. A type of database
d. A report generated once a year

9. Having the following two tables (Orders and Customers), choose the options which are valid to get the Result.

Orders

OrderID	CustomerID	OrderDate
10248	90	7/4/1996
10249	81	7/5/1996
10250	34	7/8/1996
10251	84	7/8/1996

Customers

CustomerID	CustomerName
38	Island Trading
81	Tradição Hipermercados
84	Victuailles en stock
90	Wilman Kala

Result

OrderID	OrderDate	CustomerName
10248	7/4/1996	Wilman Kala
10249	7/5/1996	Tradição Hipermercados
10251	7/8/1996	Victuailles en stock

a.
```
SELECT Orders.OrderID,
       Orders.OrderDate,
       Customers.CustomerName
FROM Orders
LEFT JOIN Customers ON Orders.CustomerID = Customers.CustomerID
WHERE Customers.CustomerID IS NOT NULL
```

b.
```
SELECT Orders.OrderID,
       Orders.OrderDate,
       Customers.CustomerName
FROM Orders
INNER JOIN Customers ON Orders.CustomerID = Customers.CustomerID
```

c.
```
SELECT Orders.OrderID,
       Orders.OrderDate,
       Customers.CustomerName
FROM Orders
RIGHT JOIN Customers ON Orders.CustomerID = Customers.CustomerID
WHERE Customers.CustomerID IS NOT NULL
```

Problems

1. You are given a database with two tables: Sales and Products.

Write a T-SQL query to retrieve the total sales amount and total quantity sold for each product category for the month of January 2023. The result should include the following columns: Category, TotalSalesAmount, TotalQuantitySold.

Ensure that the query handles cases where a category may have no sales in the specified period, it should still appear in the results with a total of 0.

Sales

SaleID	ProductID	SaleDate	Quantity	SaleAmount
1	101	1/15/2023	2	200
2	102	1/16/2023	1	150
3	101	1/17/2023	3	300
4	103	1/18/2023	5	500
5	102	1/19/2023	2	300

Products

ProductID	ProductName	Category
101	Widget A	Widgets
102	Widget B	Widgets
103	Gadget C	Gadgets

For example, the result should look like this:

Result

Category	TotalSalesAmount	TotalQuantitySold
Widgets	950	8
Gadgets	500	5

2. Given the following corporate hierarchy:

- Dan (partner)
  - Alec (senior manager)
    - John (senior)
    - Santiago (junior)
  - Michael (manager)
    - Ben (senior)
    - Jim (senior)
    - Ruth (senior)
    - Martin (senior)
  - Karen (manager)
  - Trudy (senior)
  - Alan (senior)

a. Write the definition of a table that captures the information in this hierarchy.

b. Write an insert statement for a new employee called Jane (junior), under Karen (manager).

3. You are given an employees table with the following structure:

Employees:

- Name varchar(200): the employee name
- Salary decimal(20, 2): the monthly salary
- Department varchar(100): the department in which the employee works

Write a T-SQL query to select employees whose salaries are more than 20% higher than the average salary of all employees in the company.

For example, in the Result below the calculated average salary is 4140, and the average salary + 20% threshold is 4968, so Remus is the only employee in the table that has a salary over the calculated threshold.

Employees

Name	Salary	Department
Andreea	3500	HR
Remus	5000	IT
Tudor	3800	Legal
Emilia	4400	IT
Sorin	4000	IT

Result

Name	Salary	Department
Remus	5000	IT