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SQL Server Training

**SQL Training:**

Reference Link: [SQL Tutorial](https://www.w3schools.com/sql/)

* SQL Server IDE overview
* SQL Server
  + Database Creation/Deletion
  + Data types
  + Operators
  + Table Create, Update and Delete
  + Constraints -> Primary Key, Foreign key, Default value, Unique, Auto Increment, NULL, NOT NULL, CHECK, INDEX
  + INSERT, UPDATE, DELETE, SELECT (Where, AND, OR, Order By, Group BY, Like, Top, Distinct, ASC, DESC, Having, Sub Queries)
  + SQL String Functions
  + SQL Numeric Functions
  + SQL Date Functions
  + SQL Conversion Functions
  + Joins -> Inner join, Left Join, Right Join, Outer Join, Self Join
  + Triggers
  + Stored Procedure (Variable Declaration, TRY Catch, Transactions, Validations, Temporary Table, While Loop, If ELSE, CURSOR)
  + Indexes – types and usage
  + Union, IN / NOT IN
  + Normalization / Demoralization
  + Error handling
  + TSQL Best Practices (avoid SQL-Injection etc.)

**SQL Tasks:**

Task 1: Create below 7 tables and write SQL Query for Insert, Update and Delete operation

1. Student Details:

* StudentId (Identity)
* StudentCode (Unique)
* StudentName (Minimum 3 char)
* DateOfBirth
* Address 1
* Address 2 (Allow NULL)
* CountryId (Foreign Key) (Default Value - 1)
* StateId (Foreign Key)
* CityId (Foreign Key)
* DepartmentId (Foreign Key)
* Pincode (6-digit validation)
* PhoneNumber (Unique)
* MobileNumber (Unique, Min 10-digit Number)

1. Country Master:

* CountryId
* CountryName (Minimum 3 char)

1. State Master:

* StateId
* StateName (Minimum 3 char)
* CountryId (Foreign Key)

1. City Master:

* CityId
* CityName (Minimum 3 char)
* StateId (Foreign Key)

1. Department Master:

* DepartmentId
* Department Name (Minimum 3 char)

1. Subject Master:

* Subject Id
* Subject Name (Minimun 3 char)

1. Mark Details:

* Mark Id
* Student Id (Foreign Key)
* Subject Id (Foreign Key)
* Total Mark (Default Value = 0.00)

Task 2: Write SQL query to display all Student name and Date of birth.

Task 3: Write SQL query to display first 2 Student names.

Task 4: Write SQL query to display last 2 Student names.

Task 5: Write SQL query to display Student Name and City

Task 6: Write SQL query to display whose Student Total Mark from 200 and 300

Task 7: Write SQL query to display Student Code, Student Name, Date of birth, Address 1, Address 2, Department Name, Country Name, State Name, City Name, Pincode, Phone No, Mobile Number

Task 8: Write SQL query to display Student count based on country, state and city.

Task 9: Write SQL query to display maximum Mark student details based on subject.

Task 10: Write SQL query to display minimum Mark Student details based on subject.

Task 11: Write SQL query to display all students details whose name contain 'S' character

Task 12: Write SQL query to display Unique Student name

Task 13: Write SQL query to display whose Student birthday between 1990-Mar-20 and 1990-Dec-31

Task 14: Write SQL query to display Student code is 1 and Mobile No is 999999999

Task 15: Write SQL query to display Student code is 1 or Mobile No is 999999999

Task 16: Write SQL query to display Student name whose Total Mark is greater than 500 using sub query

Task 17: Write SQL query to display Student name whose Total Mark is less than 500 using sub query

Task 18: Create a SP for Country Master Insert, Update, Select, Delete operation

Task 19: Create a SP for State Master Insert, Update, Select, Delete operation

Task 20: Create a SP for City Master Insert, Update, Select, Delete operation

Task 21: Create a SP for Department Master Insert, Update, Select, Delete operation

Task 22: Create a SP for Subject Master Insert, Update, Select, Delete operation

Task 23: Create a SP for Student Details Insert, Update, Select, Delete operation

Task 24: Create a SP for Mark Details Insert, Update, Select, Delete operation

1. Write script to insert sample records for 1000’s of students that have scored marks (randomly generated between 20-100) in subjects Mathematics, Physics, Chemistry, English and Biology
2. Get Top 5 students in school based on the score: on each Subject
3. Get Top 5 students in a city based on the total score
4. Get global ranking for all the students worldwide based on the total score
5. Get ranking for all the students in respective country based on the total score
6. Get all students that are below 40: on each Subject; in each City
7. Get all students that are below average: on each Subject; in each City
8. Write script to get list of students that have scored 100 in following subjects: Mathematics, Physics and Chemistry
9. Write script to get list of students that have scored 100 in any 3 subject in each city
10. Write script to get list of students that have scored 100 in all the subjects in each city
11. Write script to get list of students that have scored 100 in any 4 subject and average of marks is greater than 95 in each city
12. Write script to get students’ pass % in each city. E.g. Out of 100 students that attended the exam 90 have passed then pass percentage for a given city is 90%. Minimum / pass score is 50%. Note – Student is pass in the exam when he / she is pass in all the subjects of an exam.
13. Amend the tables to account the Exam and Exam specific subjects. Consider each student can also register for exam. Each exam will have fixed number of subjects.
14. Write script to get students’ pass % in each city against each exam. E.g. Out of 100 students that attended the exam 90 have passed then pass percentage for a given city is 90% for a given exam. Minimum / pass score is 50%. Note – Student is pass in the exam when he / she is pass in all the subjects of an exam.
15. For students that didn’t attend exam are not recorded in marks table. But you need to generate a report that should return “Absent” for all the subjects.
16. Write script to get count of students in each city that scored 100 in Maths and scored > 70 in Physics or Chemistry
17. Write script to get count of students in each city that scored 100 in Physics or Chemistry but between 70 and 90 in Maths
18. Design a table to accommodate employees and its supervisor. Write a query to get all the employees under their respective supervisor. Assume CEO in a company don’t have any supervisor. But others under him/her do have supervisors.
19. Design a table that records sales (for south region of India) of different items in an online shop.
20. Insert sample sales / invoice records for about 1 million with 1000 different customers for a period of 1st Jan 2018 and 31st Jan 2018.
21. Return top 1000 sales (value) for the first 10 days of January without index and record the response time in milliseconds
22. You need to consider a million sales records from south region and a million sales records in a different table from north region (with same structure) and address the point 45
23. Return top 1000 sales (value) for the first 10 days of January after applying suitable index and record the response time in milliseconds
24. You need to consider a million sales records from south region and a million sales records in a different table from north region (with same structure) and address the point 47