



## Hands-On

Microsoft SQL Certification Training

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## #Atharva's Institute

**Introduction:**

Atharva loves to teach and always dreamt of opening his own institute where he could teach different subjects. But, initially, he only took admissions for Maths, Physics, and Chemistry subjects.

Days later, his Institute has grown popular and now students are demanding different subjects owing to which he has to hire some more teachers.

Atharva is in need of your assistance to help the business stay afloat. The Institute has captured some very basic data from its few months of operation like subject, teachers, and students' information.

Help him in completing the following tasks to get insights into his business.

**Tables:**

PK: Primary Key, FK: Foreign Key, N: Not Null, U: Unique, C-Check

**1. Subject Table:**

Subject_id (PK)	Subject_name (U)
1	Mathematics
2	Physics
3	Networking
4	Biology
5	Chemistry

## 2. Teacher Table:

Teacher_id (PK)	T_Fname (N)	T_Lname (N)	T_subject_id (FK)	Teaching_since
101	Anish	Oberoi	3	19-09-2016
102	Vaishnavi	Roy	1	26-05-2015
103	Shiva	Rathore	2	21-12-2012
104	Kiran	Sharma	2	01-02-2018
105	Sneha	Tiwari	4	19-09-2014

## 3. Student Table:

**Note:** Students above 15 years are allowed to take these classes

Student_id (PK)	Student_name (N)	St_Teacher_id (FK)	St_Age (C)	DOA
201	Ved	101	17	12-05-2018
202	Aaron	102	17	15-05-2019
203	Karan	103	16	22-06-2018
204	Siri	105	18	10-07-2019
205	Keerti	103	22	11-05-2019

### Tasks:

1. Create a database with the name 'Institute'
2. Create the above tables with the specified constraints in the above database.
3. Insert the values into the table as shown in the problem statement.

4. Display the details of students whose age is 17.
5. Display the details of the teachers whose first name starts with 'S'.
6. Display the names of the students whose age is between 17 and 20.
7. Display the student id of the students whose teacher\_id is 103 and age is 16.
8. Display the records of students whose selected teacher is not Shiva.  
(use teacher id)
9. Get the First Name and Last name of the teacher/s who is/are teaching Mathematics.
10. Display the details of the teacher whose last name has the letter 'i' in it.
11. Display the Date of Admission of students who are students of Sneha.

## **##Joins**

12. Write a query to display the students whose chosen subject is 'physics'.
13. Display the student and their respective teachers' names(first name and last name).
14. Atharva wants to remove some of the teachers who are not working currently so that he can manage the expenses. Write a query to help him identify the first name of teacher/s who is/are not teaching currently.
15. One of the students with id 205, has asked for a change in teacher. Write a query to update the teacher id value of the respective student to 103.

16. Write a query to take the backup of all the three tables into new tables with the names teachers\_bkp, subjects\_bkp, teachers\_bkp.
17. Insert up to 5 new records in all the backup tables.
18. Due to some technical issues, the data has been added to the backup tables instead of the original tables. Now, you need to help Atharva delete the data from backup tables that are not present in their original tables.
19. Now that the Institute has completed a year, Atharva wants to add some more courses and teachers to the college in order to get more students enrolled in the classes. Try inserting the following records into the tables.

**Subject Table:**

Subject_id (PK)	Subject_name (U)
6	Operating Systems
7	English
8	Java
9	Python
10	Machine Learning

**Teacher Table:**

<b>Teacher_id (PK)</b>	<b>T_Fname (N)</b>	<b>T_Lname (N)</b>	<b>T_subject_id (FK)</b>	<b>Teaching_Since</b>
106	Shubham	Mehta	9	27-04-2019
107	Karthik	Prasad	8	22-06-2008
108	Shiv	Acharya	10	21-07-2007
109	Kiara	Advani	7	19-04-2018
110	Shreya	Mishra	8	16-04-2015

**Student Table:**

<b>Student_id (PK)</b>	<b>Student_name (N)</b>	<b>St_Teacher_id (FK)</b>	<b>St_Age (C)</b>	<b>DOA</b>
206	Shray	110	18	22-05-2019
207	Amit	107	17	18-05-2018
208	Sirisha	105	16	13-06-2019
209	Satwik	108	19	13-09-2019
210	Manisha	106	18	10-05-2018

20. Update the backup tables to the latest values you have added to the original tables.
21. The examination department of the institute has two timesheets created for the exam schedule. One is the sheet given to students which would 't\_exam' table and the other is the sheet made by the

examination department which is the 'exam' sheet. Use the below script to create and insert the above tables.

Use a merge statement to update the dates in the 't\_exam' table.

**Script:**

```
create table exam(exam_id int, exam_subject_id int foreign key
references subjects(subject_id),exam_date date)
create table t_exam(texam_id int, exam_subject_id int foreign key
references subjects(subject_id),texam_date date)
```

```
insert into exam
values(301,10,'08-24-2019'),
(302,2,'08-26-2019'),
(303,9,'08-28-2019'),
(304,8,'08-30-2019'),
(306,4,'09-03-2019')
```

```
insert into t_exam
values(301,10,'08-21-2019'),
(302,2,'08-23-2019'),
(303,9,'08-25-2019'),
(304,8,'08-27-2019'),
(305,7,'08-29-2019'),
(306,4,'08-31-2019')
```

```
select * from t_exam
select * from exam
```

22. Display the names of the students who joined in the month of September 2019.
23. Sirisha now wants to learn English. Update her teacher id to 109.
24. Display the count of students who joined in the year 2019.
25. Display the count of students who has opted for physics subject.
26. Display the age of the oldest student.
27. What is the name of the teacher who is teaching the youngest student?
28. Display full names of all the teachers.
29. Add a new column with the name salary in the teacher's table.
30. Update the values of the new column in such a way that all the even id teachers should be given Rs.2000 as salary and rest of the teachers should get 2,500
31. What are the total expenses Atharva has spent on the salaries of teachers per day?
32. What are the total expenses Atharva has spent on the salaries of teachers per day?
33. What is the total amount of money allotted for each subject's teachers?
34. What are the subjects with maximum teachers' salary expense?
35. Display the count of teachers who are currently not teaching.
36. How much amount of savings can be done if the teacher not teaching currently is removed from the institute.
37. Calculate the maximum experience among all the teachers.
38. Who is the most experienced teacher?
39. How many teachers started their teaching career in the current month.



40. Display the names of the teachers who started their careers in 2018.
41. Display the total number of teachers who joined each year.
42. Display the top 3 experienced teachers.
43. Display the second-highest experienced teacher.
44. create a user-defined function that would return nth highest experienced person.
45. What is the avg salary a teacher is receiving for each subject?
46. Use the following script to create the admins table which contains the names of the people who made the admissions and ids of students who took the admission in the institute along with the fees paid and insert respective values

```
create table admins(admin_id int,admin_name
varchar(100),ad_student_id int,stu_fee int)
insert into admins
select 103,'Shiva Rathore',205,7000 union all
select 107,'Karthik Prasad',204,6000 union all
select 112,'Renu Devi',209,7500 union all
select 113,'Vani Balakrishnan',201,6600 union all
select 103,'Shiva Rathore',203,5500 union all
select 114,'Malavika Iyer',206,6200 union all
select 107,'Karthik Prasad',202,5000 union all
select 112,'Renu Devi',207,7500 union all
select 113,'Vani Balakrishnan',210,6400 union all
select 103,'Shiva Rathore',208,6000
```

47. Display the names of the people along with the count of students they have admitted.
48. How many teachers have also worked as admins?
49. Name the teachers who have also worked as admins.
50. Display the names of the students along with their fees paid for the institute in the decreasing order of the fees paid.
51. Who has paid the highest fees among all the students?

