National University of Computer and Emerging Sciences



Lab Manual

"Views"

Database Systems
Spring 2022

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1 Views

In previous lab manuals you learned how to write select query to retrieve data. While some select queries you write might be used only for one time activity, some select queries are used again and again within your application/environment. Some of these queries that you reuse within your environment contain complex logic, and you would not want to rewrite them every time you use them. SQL server allows you to store a SELECT statement within a database using an object called a view. In this section you will learn how to CREATE as view, modify data through a view, how to ALTER a view, and how to use a view.

We will use the Student schema for all the examples (given in last lab)

Students	StudentID	Student Na	me Stu	udent Batch	CGPA	
	1	Ali	20	13	2.625	
	2	Aysha	20	13	4	
	3	Ahmed	20	13	2.2	
	4	Bilal	20	12	2.5	
	5	Zafar	20	112	3.5	
Instructors	InstructorID	Instructor	sName			
	1	Zafar				
	2	Sadia				
	3	Saima				
Courses	CourseID	CourseNam	е	Cours	eCredit Hour	rs InstructorID
	1	Computer Programming		ing 3		1
	2	Computer Organization		ion 3		2
	3	Computer F	rogramm	i 1		NULL
	4	Database		3		2
	5	Database	Lab	1		1
Registerations	StudentID	CourseID	GPA			
	1	1	3			
	1	3	3			
	1	4	2			
	1	5	3			
	2	1	2.5			
	2	2	0			
	2	4	3			

1.1 Create a View

View is simple a select statement that has been given a name and stored in dataset. View is also called a virtual table, because there is no data in the view itself, it's just a select query that get data from base tables

create View < View Name >

AS

< Select Query>

When you excute a create view statement you should get command successful notification, just like when you created a table.

TRY IT

```
--CREATE A VIEW THAT GIVE NAMES OF ALL THE STUDENTS WITH GPA=3 IN ANY SUBJECT Create View [3GPAStudents]
AS
Select S.StudentName
from Students S inner join Registration R on S.StudentID=R.StudentID
where R.GPA=3
```

Here the base tables are Student and Registration

TRY THIS

```
--Create a view to given Student Name, Roll Number and His CGPA (calcualte CGPA using Aggregation)

Create View StudentCGPA

as

Select S.StudentName, S.StudentID , SUM(C.CourseCreditHours* R.GPA) / SUM(C.CourseCreditHours) AS [CGPA]

From Students S inner join Registration R on R.StudentID=S.StudentID

inner join Courses C on C.CourseID=R.CourseID

Group by S.StudentName, S.StudentID

go

Messages

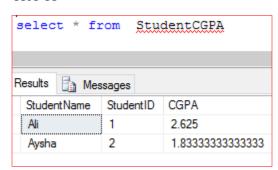
mmand(s) completed successfully.
```

Here the base tables are Students, Registration and Courses.

**NOTE: EVERY COLUMN RETURNED BY SELECT QUERY OF VIEW SHOULD HAVE UNIQUE NAME, DERIVED COLUMNS SHOULD BE GIVEN ALIAS. COLUMNS WITH SAME NAMES SHOULD ALSO BE GIVEN DISTINCT ALIAS

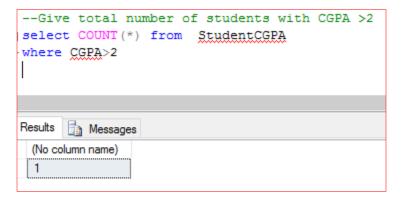
1.2 Use a View

As already told view are virtual tables. You can use them as regular tables in SELECT statement.



**NOTE: this data was not present in StudentCGPA view, rather when you select a view, the Select query in body of view is executed and result is returned.

Similarly you can join views with tables of views, you can take aggregates of view.



1.3 Alter a View

You can change the select query of your view by using following syntax

Alter View <ViewName>
AS

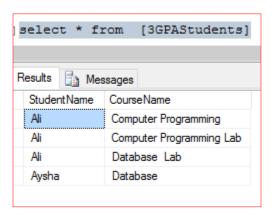
< Select Query>

TRY IT

```
--Change you [3GPAStudents] view, now it should given student name and subject name in which student got 3 GPA
ALTER View [3GPAStudents]
AS
Select S.StudentName, C.CourseName
-from Students S inner join Registration R on S.StudentID=R.StudentID
jinner join Courses C on C.CourseID=R.CourseID
-where R.GPA=3

Messages
ommand(s) completed successfully.
```

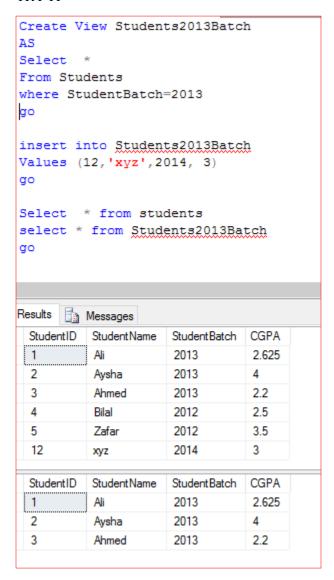
Now retrived the data from view



1.4 Insert Update Delete Data Through View

As view is a virtual table and has no data of its own, if you run delete insert or update query on view, the data in base table will change (if the change is feasible and is not violating any constraint). If the select query in View has joins and aggregates then delete insert or update would not work.

Read Elmasri Chapter 5 for more details.

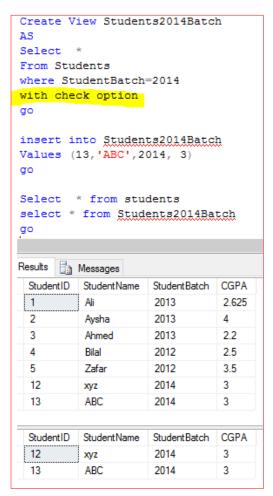


1.5 With Check Option

With check option ensures that the only data manipulation that can occur through view also must be retrievable though that view.

In previous example the XYZ student we added though the view, was not retrievable thought view. If we add with check option that insertion would not have been possible though view.

TRY IT



Now try adding a row that thought Student2014Batch that will not be retrievable though it