MOHIT SHARMA

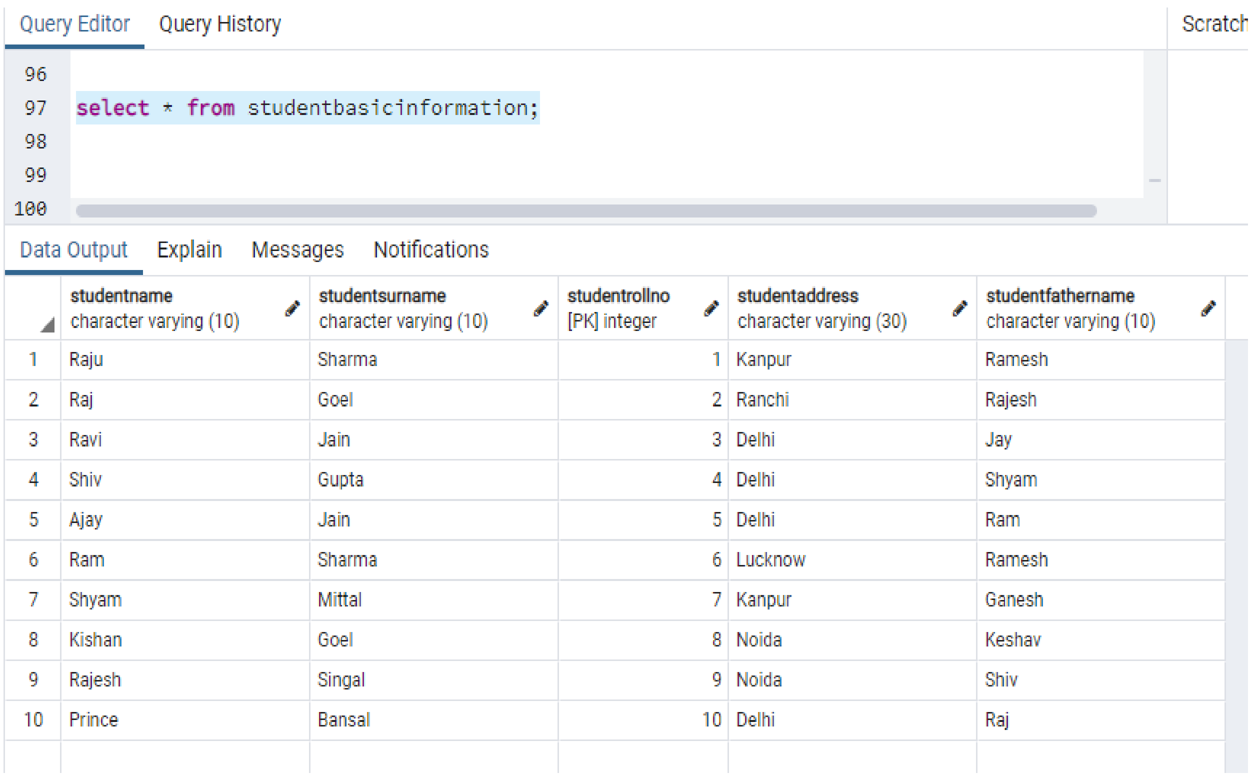
SQL Assignment

1. Create Student Database

   Create database student;

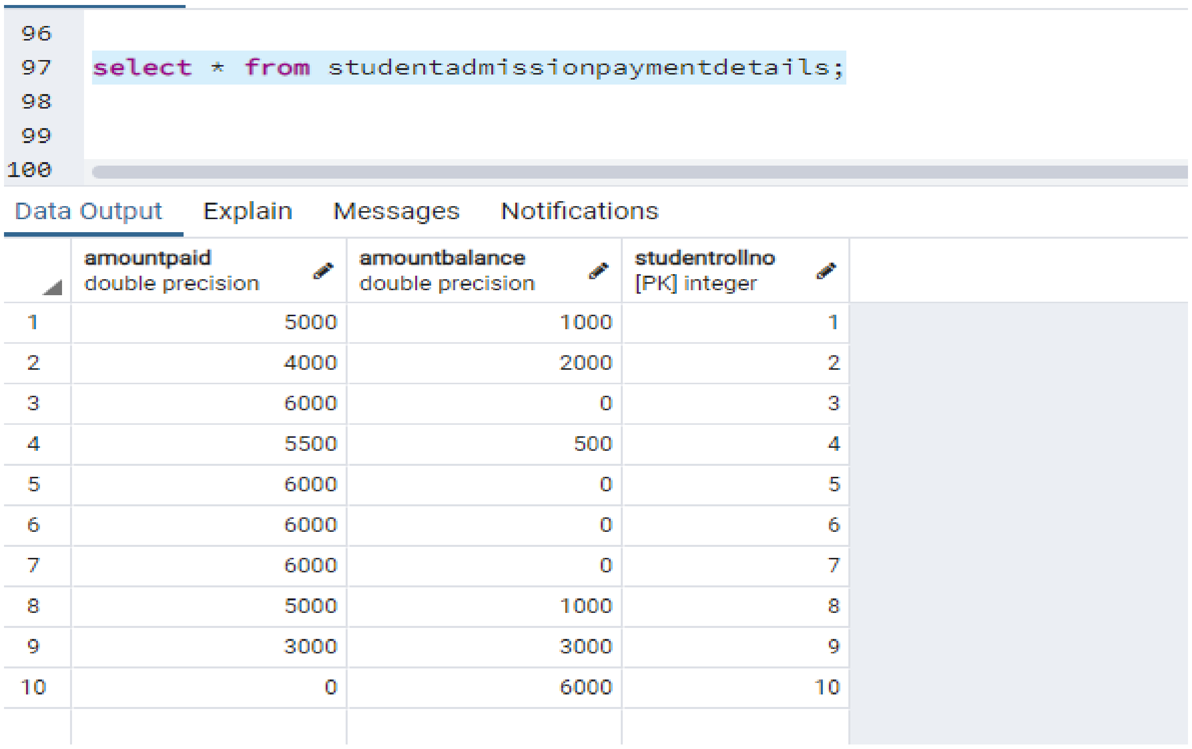
2. Create the following table under the Student Database:
   a. StudentBasicInformation
      i. Columns
         1. StudentName
         2. StudentSurname
         3. StudentRollNo
         4. StudentAddress
         5. Add more three basic columns of the name of your own
   b. StudentAdmissionPaymentDetails
      i. Columns
         1. StudentRollNo
         2. AmountPaid
         3. AmountBalance
         4. Add more four basic columns of the name of your own
   c. StudentSubjectInformation
      i. Columns
         1. SubjectOpted
         2. StudentRollNo
         3. SubjectTotalMarks
         4. SubjectObtainedMarks
         5. StudentMarksPercentage
         6. Add more one columns of the name of your own
   d. SubjectScholarshipInformation
      i. Columns
         1. StudentRollNo
         2. ScholarshipName
         3. ScholarshipDescription
         4. ScholarshipAmount
         5. ScholarshipCategory
         6. Add more two columns of the name of your own
3. Insert more than 10 records in each and every table created

4. Snap of the all the tables once the insertion is completed



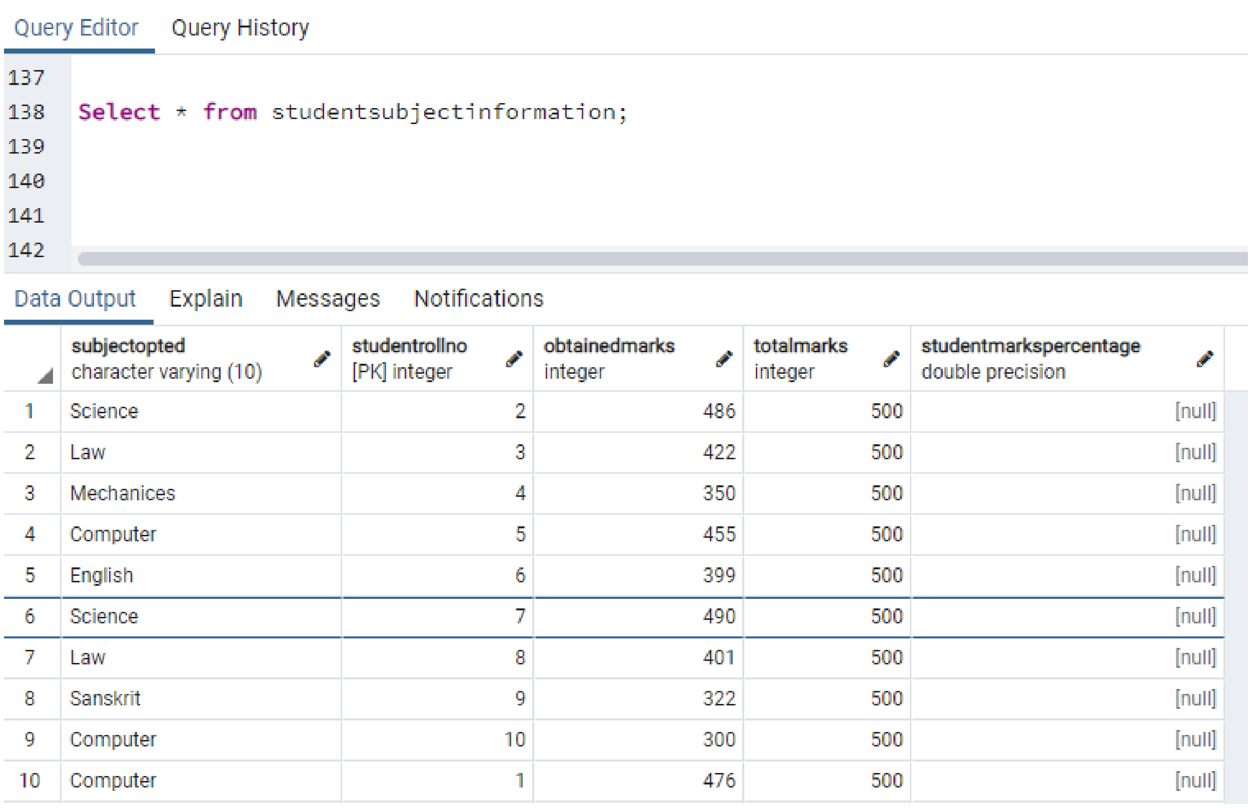
```sql
select * from studentbasicinformation;
```

	studentname character varying (10)	studentsurname character varying (10)	studentrollno [PK] integer	studentaddress character varying (30)	studentfathername character varying (10)
1	Raju	Sharma	1	Kanpur	Ramesh
2	Raj	Goel	2	Ranchi	Rajesh
3	Ravi	Jain	3	Delhi	Jay
4	Shiv	Gupta	4	Delhi	Shyam
5	Ajay	Jain	5	Delhi	Ram
6	Ram	Sharma	6	Lucknow	Ramesh
7	Shyam	Mittal	7	Kanpur	Ganesh
8	Kishan	Goel	8	Noida	Keshav
9	Rajesh	Singal	9	Noida	Shiv
10	Prince	Bansal	10	Delhi	Raj



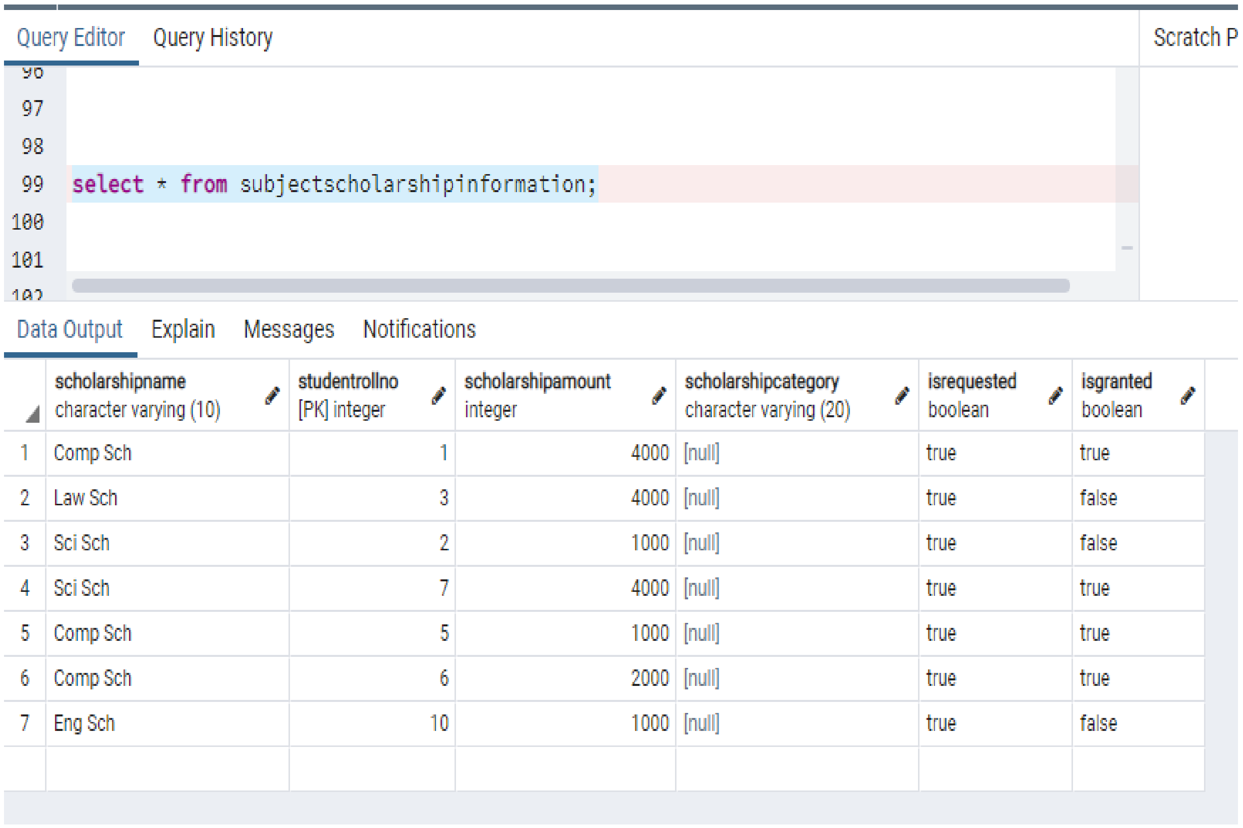
```sql
select * from studentadmissionpaymentdetails;
```

	amountpaid double precision	amountbalance double precision	studentrollno [PK] integer
1	5000	1000	1
2	4000	2000	2
3	6000	0	3
4	5500	500	4
5	6000	0	5
6	6000	0	6
7	6000	0	7
8	5000	1000	8
9	3000	3000	9
10	0	6000	10



```
Select * from studentsubjectinformation;
```

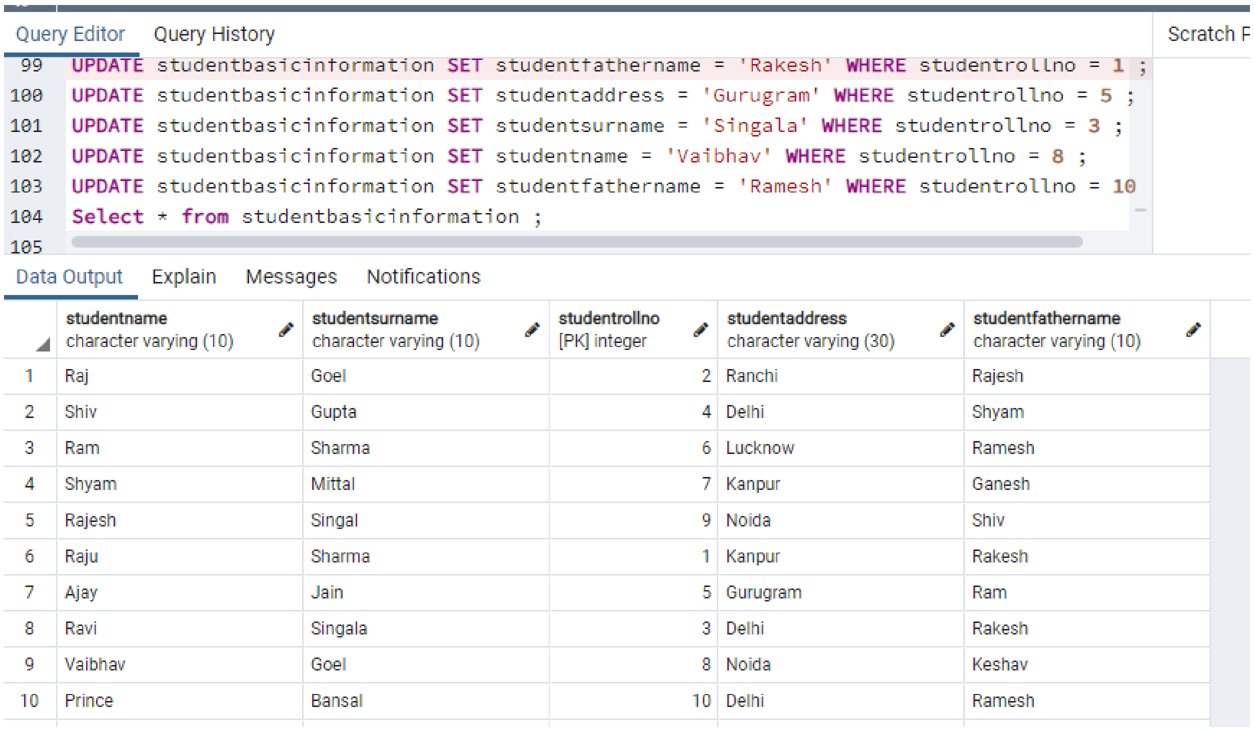
	subjectopted character varying (10)	studentrollno [PK] integer	obtainedmarks integer	totalmarks integer	studentmarkspercentage double precision
1	Science	2	486	500	[null]
2	Law	3	422	500	[null]
3	Mechanices	4	350	500	[null]
4	Computer	5	455	500	[null]
5	English	6	399	500	[null]
6	Science	7	490	500	[null]
7	Law	8	401	500	[null]
8	Sanskrit	9	322	500	[null]
9	Computer	10	300	500	[null]
10	Computer	1	476	500	[null]



```
select * from subjectscholarshipinformation;
```

	scholarshipname character varying (10)	studentrollno [PK] integer	scholarshipamount integer	scholarshipcategory character varying (20)	isrequested boolean	isgranted boolean
1	Comp Sch	1	4000	[null]	true	true
2	Law Sch	3	4000	[null]	true	false
3	Sci Sch	2	1000	[null]	true	false
4	Sci Sch	7	4000	[null]	true	true
5	Comp Sch	5	1000	[null]	true	true
6	Comp Sch	6	2000	[null]	true	true
7	Eng Sch	10	1000	[null]	true	false

5. Update any 5 records of your choice in any table like update the StudentAddress with some other address content and likewise so on with any records of any table of your choice
6. Snap of the all the tables post updating.



Query Editor Query History Scratch P

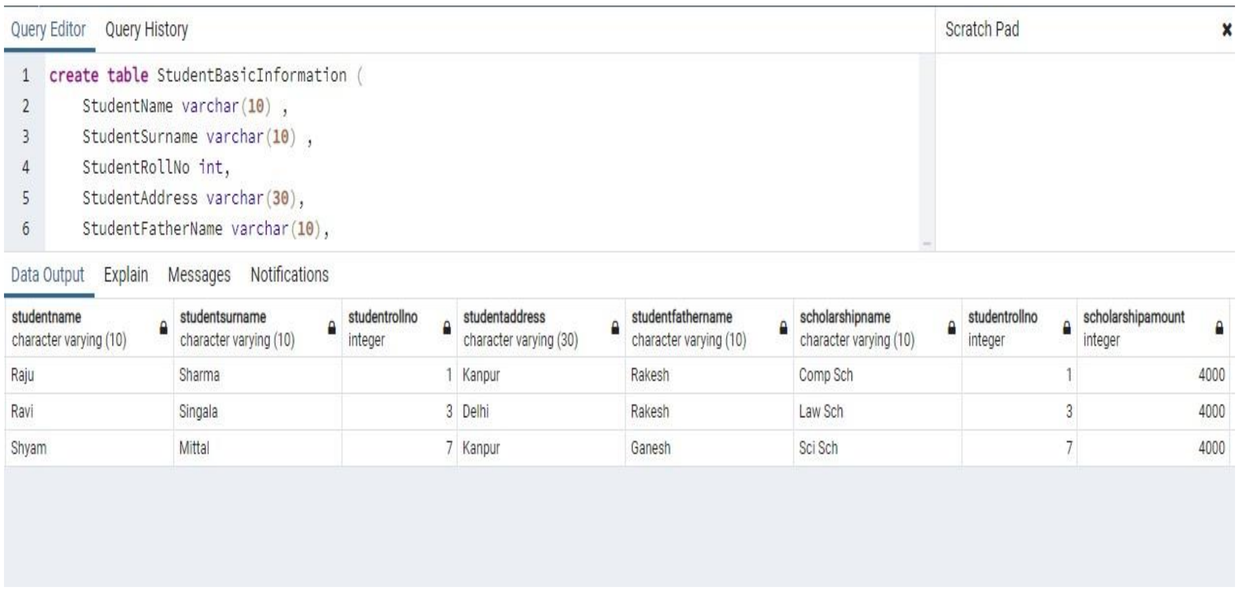
```
UPDATE studentbasicinformation SET studentfathername = 'Rakesh' WHERE studentrollno = 1 ;
UPDATE studentbasicinformation SET studentaddress = 'Gurugram' WHERE studentrollno = 5 ;
UPDATE studentbasicinformation SET studentsurname = 'Singala' WHERE studentrollno = 3 ;
UPDATE studentbasicinformation SET studentname = 'Vaibhav' WHERE studentrollno = 8 ;
UPDATE studentbasicinformation SET studentfathername = 'Ramesh' WHERE studentrollno = 10
Select * from studentbasicinformation ;
```

Data Output Explain Messages Notifications

	studentname character varying (10)	studentsurname character varying (10)	studentrollno [PK] integer	studentaddress character varying (30)	studentfathername character varying (10)
1	Raj	Goel	2	Ranchi	Rajesh
2	Shiv	Gupta	4	Delhi	Shyam
3	Ram	Sharma	6	Lucknow	Ramesh
4	Shyam	Mittal	7	Kanpur	Ganesh
5	Rajesh	Singal	9	Noida	Shiv
6	Raju	Sharma	1	Kanpur	Rakesh
7	Ajay	Jain	5	Gurugram	Ram
8	Ravi	Singala	3	Delhi	Rakesh
9	Vaibhav	Goel	8	Noida	Keshav
10	Prince	Bansal	10	Delhi	Ramesh

7. Select the student details records who has received the scholarship more than 5000Rs/-

select *
from StudentBasicDetails
inner join StudentScholarshipDetails
on StudentBasicDetails.RollNo=StudentScholarshipDetails.Rollno
where Amount>5000;



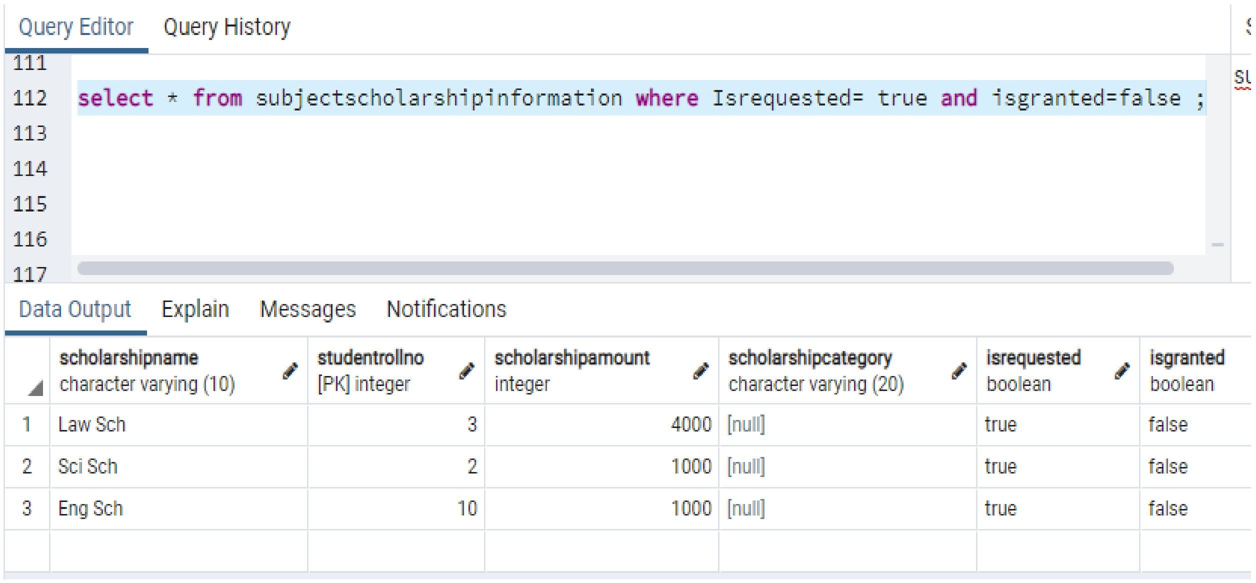
Query Editor Query History Scratch Pad

```
create table StudentBasicInformation (
    StudentName varchar(10) ,
    StudentSurname varchar(10) ,
    StudentRollNo int,
    StudentAddress varchar(30),
    StudentFatherName varchar(10),
```

Data Output Explain Messages Notifications

studentname character varying (10)	studentsurname character varying (10)	studentrollno integer	studentaddress character varying (30)	studentfathername character varying (10)	scholarshipname character varying (10)	studentrollno integer	scholarshipamount integer
Raju	Sharma	1	Kanpur	Rakesh	Comp Sch	1	4000
Ravi	Singala	3	Delhi	Rakesh	Law Sch	3	4000
Shyam	Mittal	7	Kanpur	Ganesh	Sci Sch	7	4000

8. Select the students who opted for scholarship but has not got the scholarship

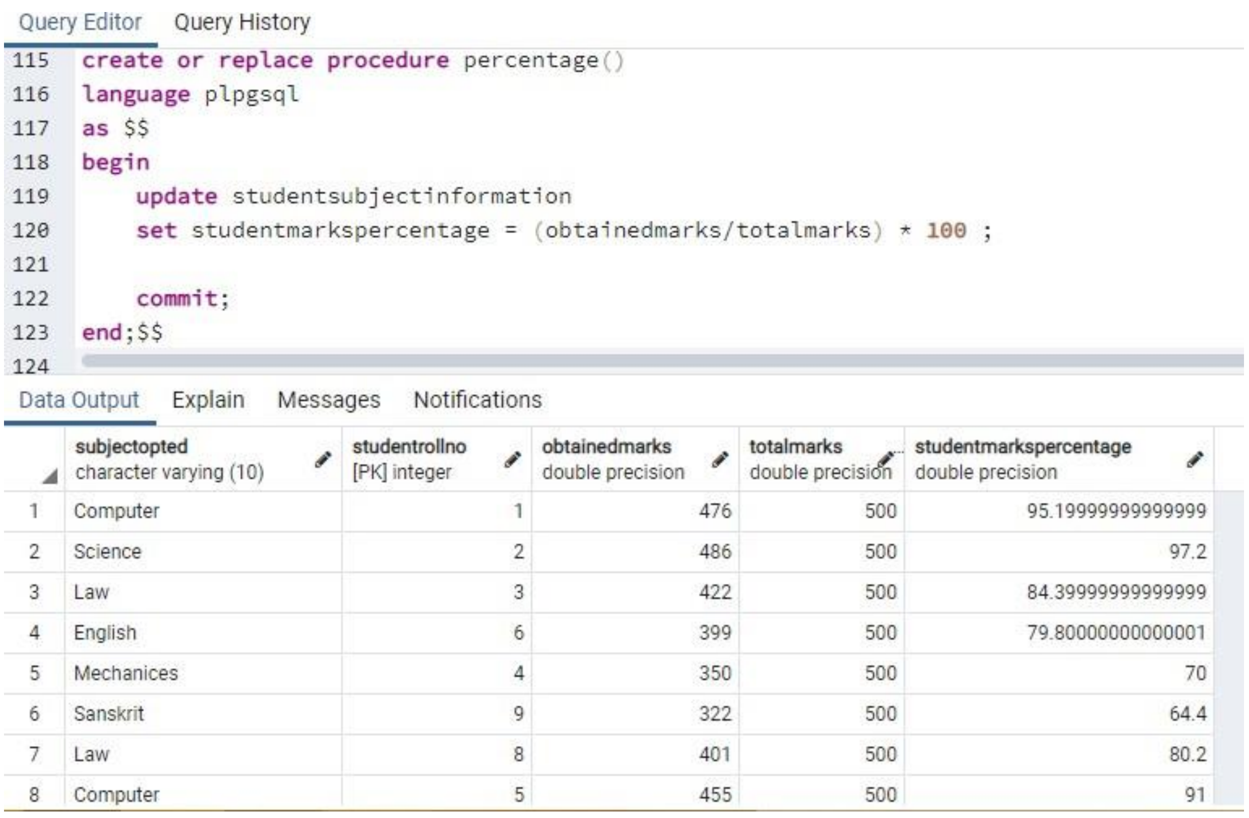

Query Editor Query History

```
select * from subjectscholarshipinformation where Isrequested= true and isgranted=false ;
```

Data Output Explain Messages Notifications

	scholarshipname character varying (10)	studentrollno [PK] integer	scholarshipamount integer	scholarshipcategory character varying (20)	isrequested boolean	isgranted boolean
1	Law Sch	3	4000	[null]	true	false
2	Sci Sch	2	1000	[null]	true	false
3	Eng Sch	10	1000	[null]	true	false

9. Fill in data for the percentage column i.e. StudentMarksPercentage in the table StudentSubjectInformation by creating and using the stored procedure created


Query Editor Query History

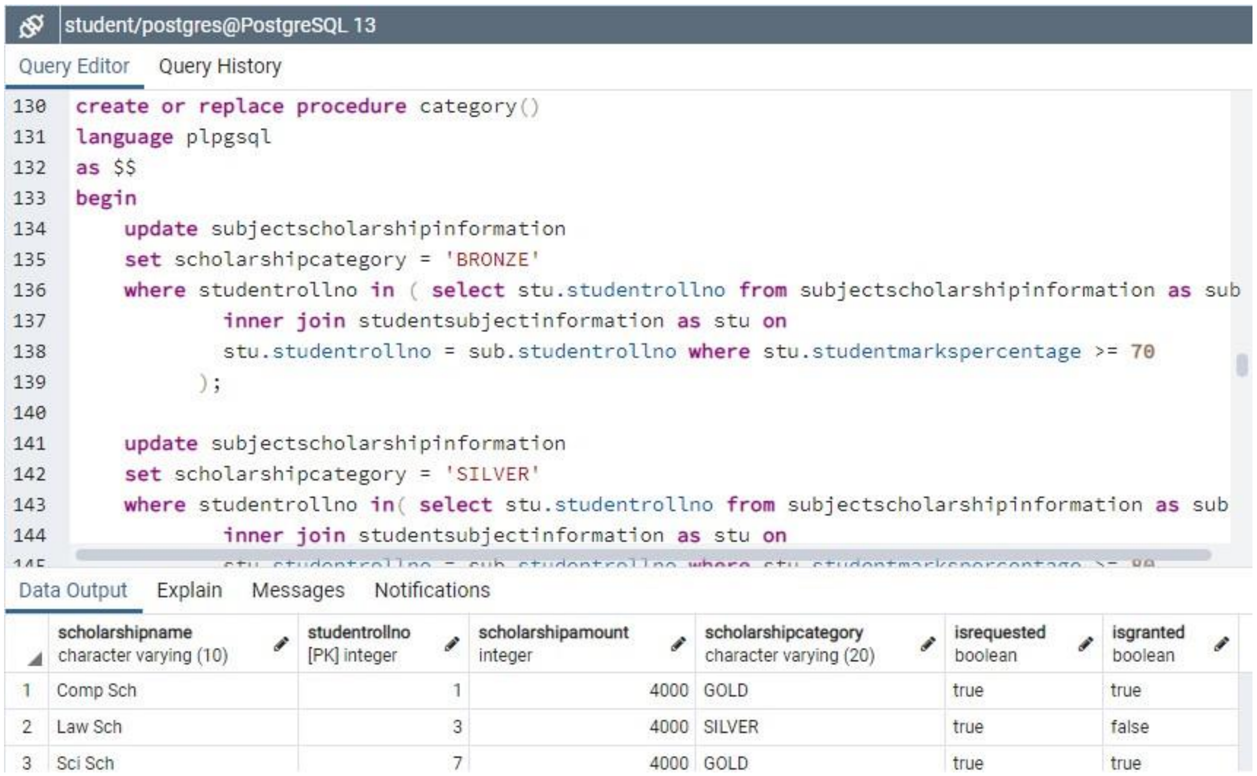
```
create or replace procedure percentage()
language plpgsql
as $$
begin
    update studentsubjectinformation
    set studentmarkspercentage = (obtainedmarks/totalmarks) * 100 ;

    commit;
end;$$
```

Data Output Explain Messages Notifications

	subjectopted character varying (10)	studentrollno [PK] integer	obtainedmarks double precision	totalmarks double precision	studentmarkspercentage double precision
1	Computer	1	476	500	95.19999999999999
2	Science	2	486	500	97.2
3	Law	3	422	500	84.39999999999999
4	English	6	399	500	79.80000000000001
5	Mechanices	4	350	500	70
6	Sanskrit	9	322	500	64.4
7	Law	8	401	500	80.2
8	Computer	5	455	500	91

10. Decide the category of the scholarship depending upon the marks/percentage obtained by the student and likewise update the ScholarshipCategory column, create a stored procedure in order to handle this operation

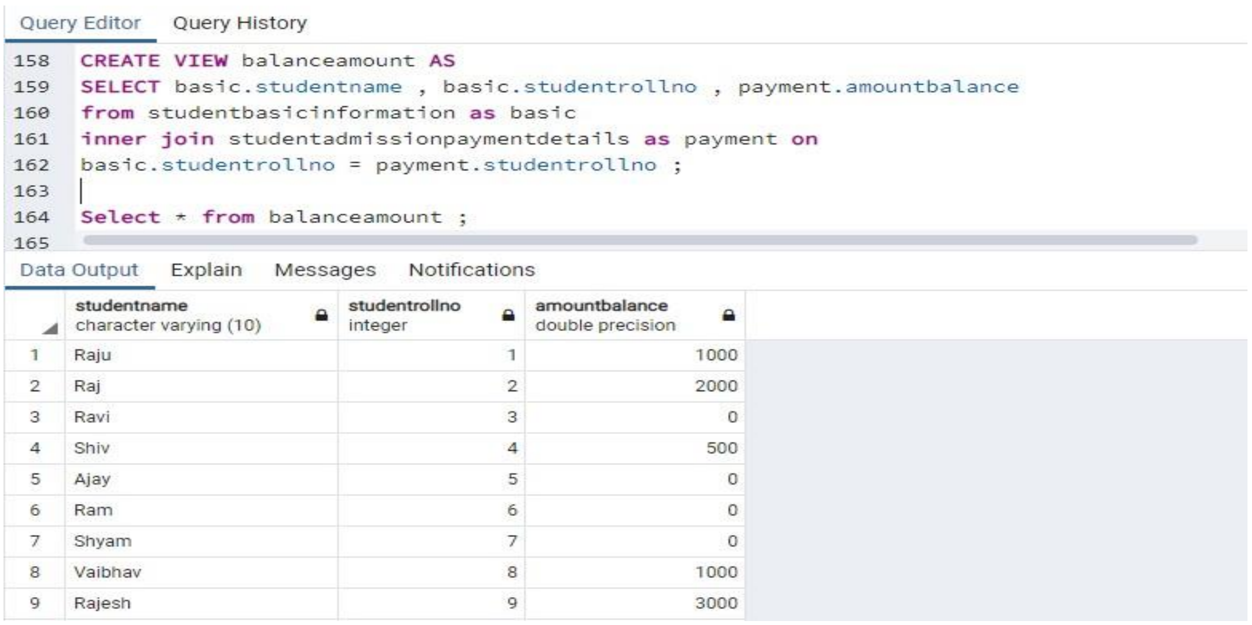


```sql
create or replace procedure category()
language plpgsql
as $$
begin
    update subjectscholarshipinformation
    set scholarshipcategory = 'BRONZE'
    where studentrollno in ( select stu.studentrollno from subjectscholarshipinformation as sub
            inner join studentsubjectinformation as stu on
            stu.studentrollno = sub.studentrollno where stu.studentmarkspercentage >= 70
          );

    update subjectscholarshipinformation
    set scholarshipcategory = 'SILVER'
    where studentrollno in( select stu.studentrollno from subjectscholarshipinformation as sub
            inner join studentsubjectinformation as stu on
            stu.studentrollno = sub.studentrollno where stu.studentmarkspercentage >= 80
```

	scholarshipname character varying (10)	studentrollno [PK] integer	scholarshipamount integer	scholarshipcategory character varying (20)	isrequested boolean	isgranted boolean
1	Comp Sch	1	4000	GOLD	true	true
2	Law Sch	3	4000	SILVER	true	false
3	Sci Sch	7	4000	GOLD	true	true

11. Create the View which shows balance amount to be paid by the student along with the student detailed information (use join)

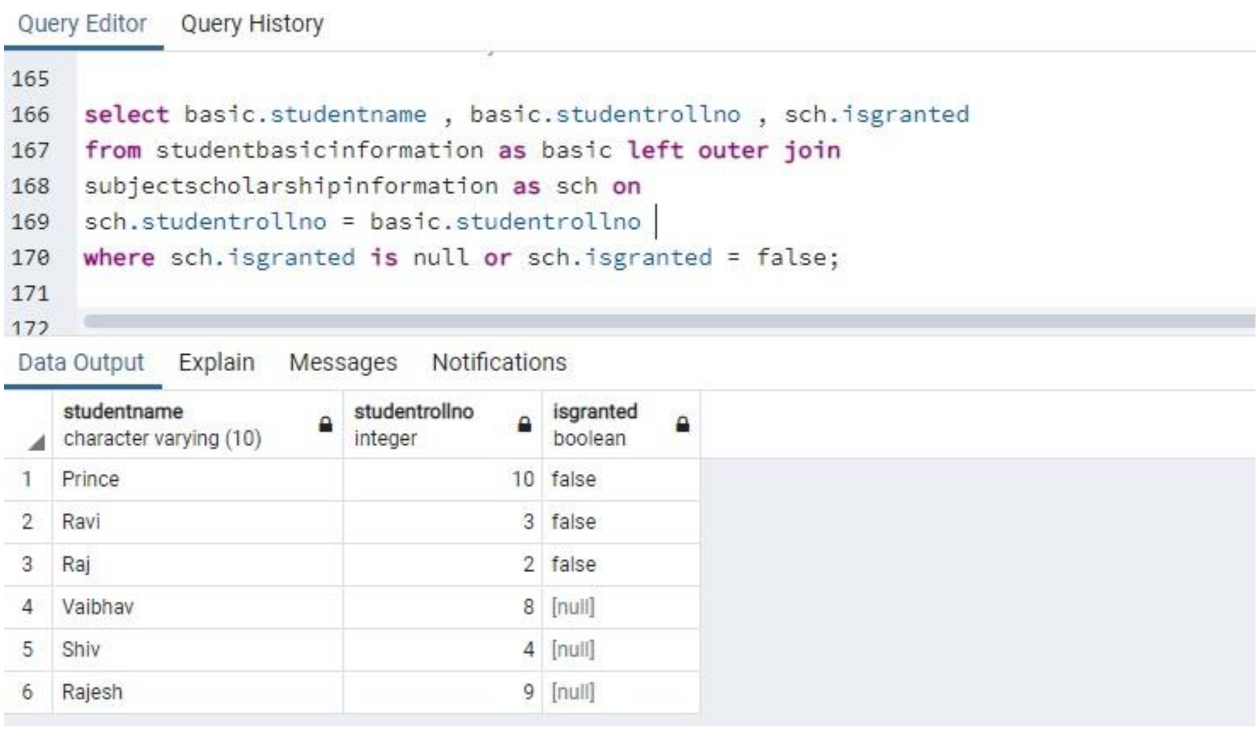


```sql
CREATE VIEW balanceamount AS
SELECT basic.studentname , basic.studentrollno , payment.amountbalance
from studentbasicinformation as basic
inner join studentadmissionpaymentdetails as payment on
basic.studentrollno = payment.studentrollno ;

Select * from balanceamount ;
```

	studentname character varying (10)	studentrollno integer	amountbalance double precision
1	Raju	1	1000
2	Raj	2	2000
3	Ravi	3	0
4	Shiv	4	500
5	Ajay	5	0
6	Ram	6	0
7	Shyam	7	0
8	Vaibhav	8	1000
9	Rajesh	9	3000

12. Get the details of the students who haven't got any scholarship (use joins/subqueries)



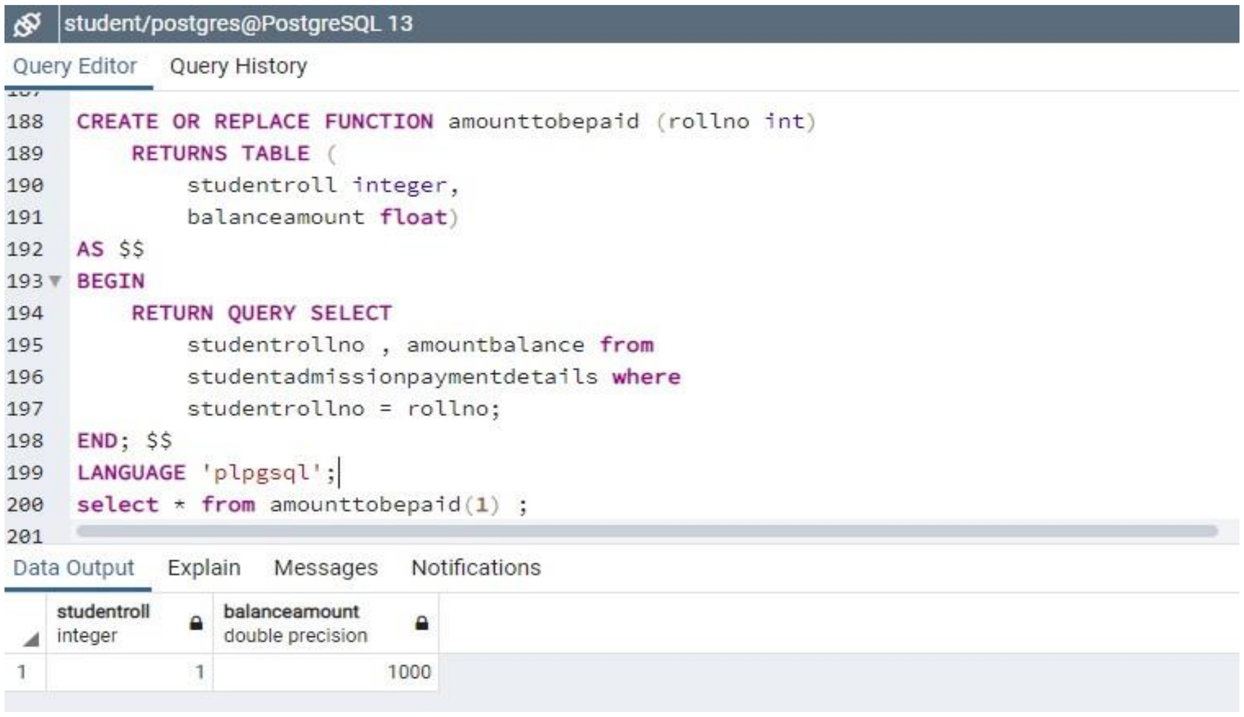
Query Editor Query History

```
select basic.studentname , basic.studentrollno , sch.isgranted
from studentbasicinformation as basic left outer join
subjectscholarshipinformation as sch on
sch.studentrollno = basic.studentrollno
where sch.isgranted is null or sch.isgranted = false;
```

Data Output Explain Messages Notifications

	studentname character varying (10)	studentrollno integer	isgranted boolean
1	Prince	10	false
2	Ravi	3	false
3	Raj	2	false
4	Vaibhav	8	[null]
5	Shiv	4	[null]
6	Rajesh	9	[null]

13. Create Stored Procedure which will be return the amount balance to be paid by the student as per the student roll number passed through the stored procedure as the input



student/postgres@PostgreSQL 13

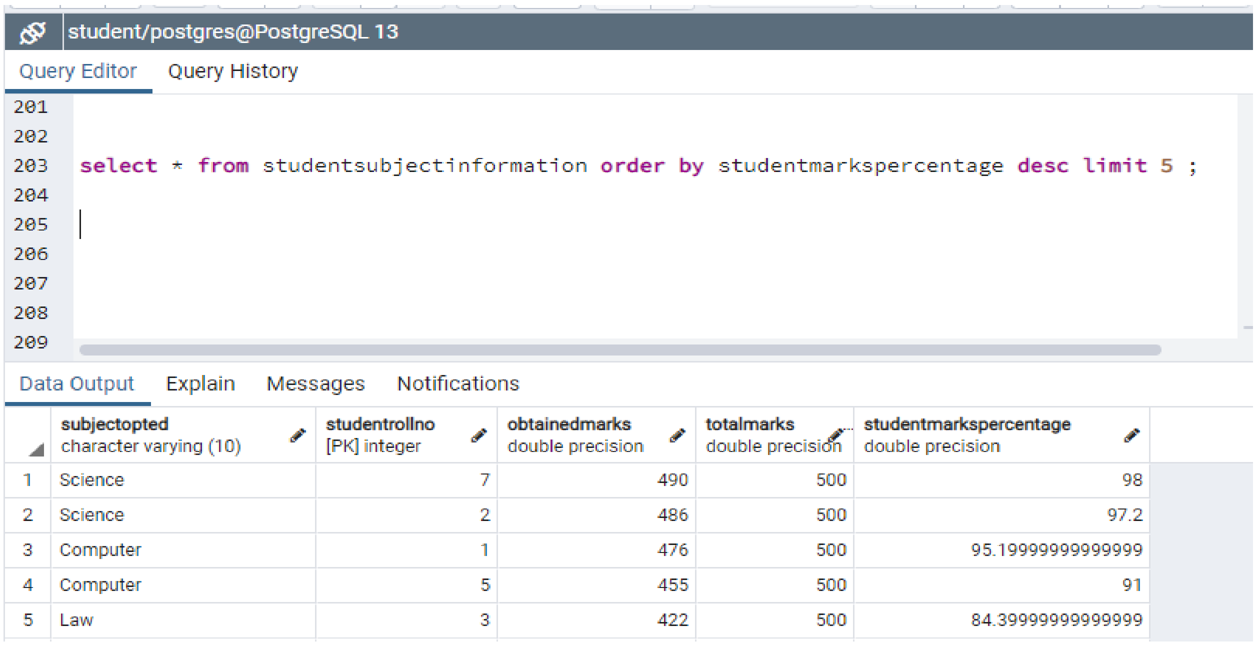
Query Editor Query History

```
CREATE OR REPLACE FUNCTION amounttobepaid (rollno int)
    RETURNS TABLE (
        studentroll integer,
        balanceamount float)
AS $$
BEGIN
    RETURN QUERY SELECT
        studentrollno , amountbalance from
        studentadmissionpaymentdetails where
        studentrollno = rollno;
END; $$
LANGUAGE 'plpgsql';
select * from amounttobepaid(1) ;
```

Data Output Explain Messages Notifications

	studentroll integer	balanceamount double precision
1	1	1000

14. Retrieve the top five student details as per the StudentMarksPercentage values



student/postgres@PostgreSQL 13

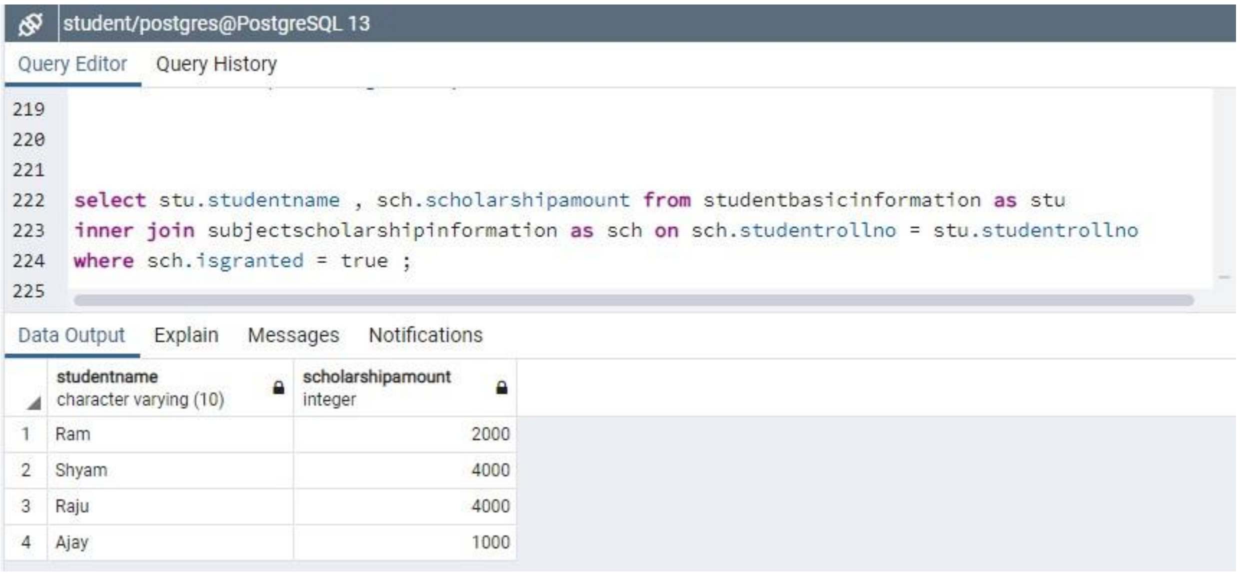
```
select * from studentsubjectinformation order by studentmarkspercentage desc limit 5 ;
```

	subjectopted character varying (10)	studentrollno [PK] integer	obtainedmarks double precision	totalmarks double precision	studentmarkspercentage double precision
1	Science	7	490	500	98
2	Science	2	486	500	97.2
3	Computer	1	476	500	95.19999999999999
4	Computer	5	455	500	91
5	Law	3	422	500	84.39999999999999

15. Try to use all the three types of join learned today in a relevant way, and explain the same why you thought of using that particular join for your selected scenarios (try to cover relevant and real time scenarios for all the three studied joins)

Inner join

We can use inner join in the case when want to join two tables in such a way that only those records appear which are present in both the tables. One such case is when we have to find the student names which are granted with the scholarship, in this the record should be present in both the tables that is why we have to use inner join.



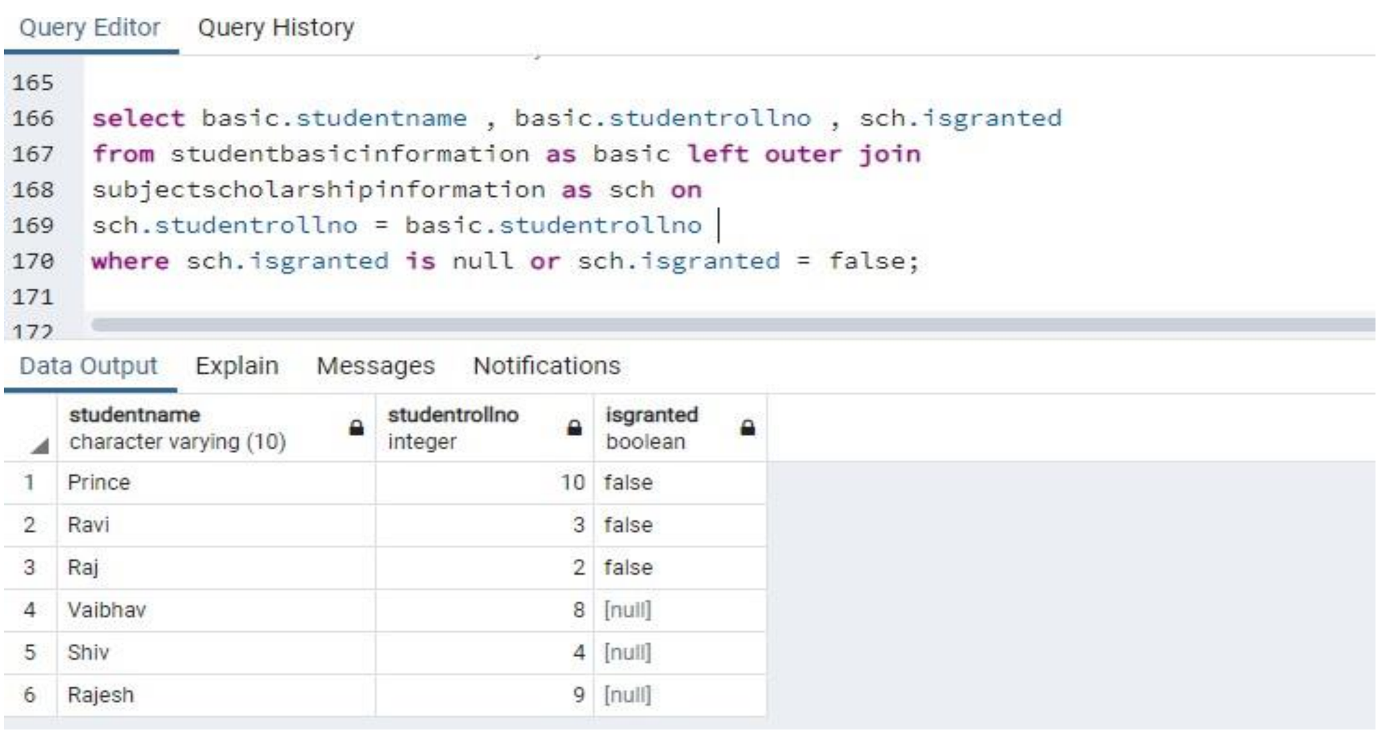
student/postgres@PostgreSQL 13

```
select stu.studentname , sch.scholarshipamount from studentbasicinformation as stu
inner join subjectscholarshipinformation as sch on sch.studentrollno = stu.studentrollno
where sch.isgranted = true ;
```

	studentname character varying (10)	scholarshipamount integer
1	Ram	2000
2	Shyam	4000
3	Raju	4000
4	Ajay	1000

Left Outer join

We use left outer join where we need all the relevant records from the left table irrespective to the thing weather same record is present in right table or not. One such case is when we have to find the names of students who haven't receive any scholarship, in this two cases are there may be student have requested but didn't granted in this case record is present in the scholarship table but if the student haven't requested then its record is not there in scholarship table but we have print their names also. Therefore we have to use left outer join.


Query Editor Query History

```
select basic.studentname , basic.studentrollno , sch.isgranted
from studentbasicinformation as basic left outer join
subjectscholarshipinformation as sch on
sch.studentrollno = basic.studentrollno
where sch.isgranted is null or sch.isgranted = false;
```

Data Output Explain Messages Notifications

	studentname character varying (10)	studentrollno integer	isgranted boolean
1	Prince	10	false
2	Ravi	3	false
3	Raj	2	false
4	Vaibhav	8	[null]
5	Shiv	4	[null]
6	Rajesh	9	[null]

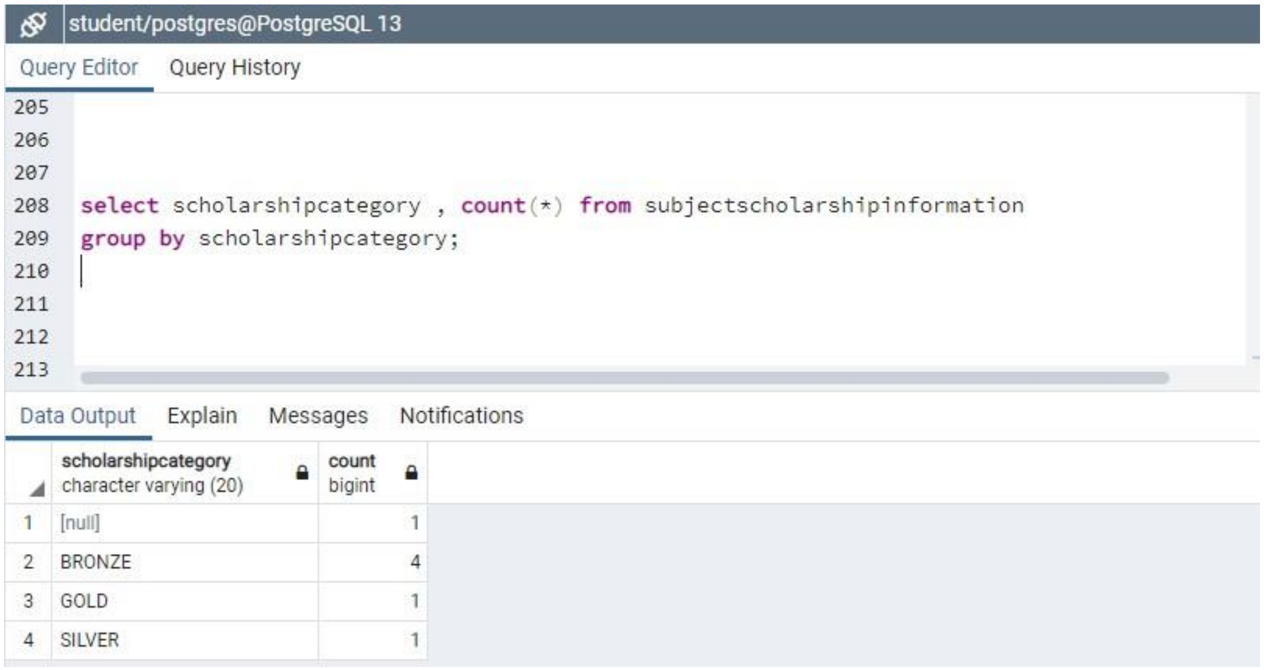
Right Outer Join

It is same as left outer join but in it all records present in right table are there irrespective to weather it is present in left table or not. So the above example will fit into it also if we put basicinformation table in right and scholarship table in left.

16. Mention the differences between the delete, drop and truncate commands

DELETE Command	*DROP command*	*TRUNCATE command*
It is a DML command	*It is a DDL command*	*It is a DDL command*
It is used to delete one or more rows in the table.	*It is used to delete the entire table from the database.*	*It is used to delete all the records from the table.*
It doesn't frees the memory taken by the rows.	*It frees the memory taken by the table.*	*It frees the memory taken by the rows.*

17. Get the count of the Scholarship category which is highly been availed by the students, i.e. get the count of the total number of students corresponding to the each scholarships category



student/postgres@PostgreSQL 13

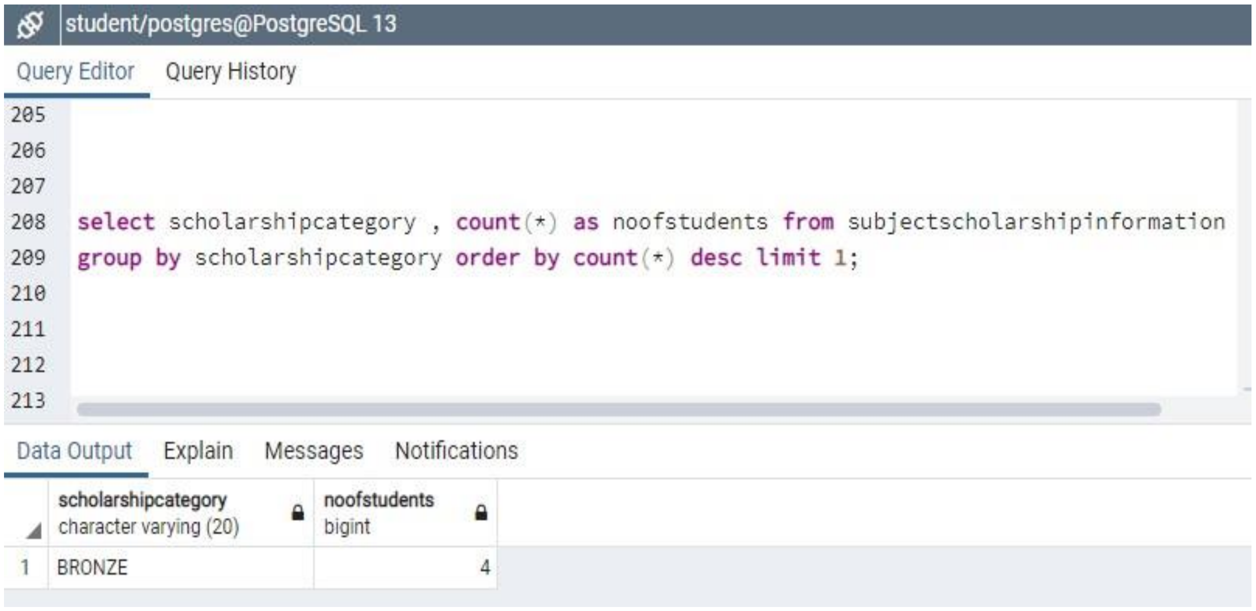
Query Editor Query History

```sql
select scholarshipcategory , count(*) from subjectscholarshipinformation
group by scholarshipcategory;
```

Data Output Explain Messages Notifications

	scholarshipcategory character varying (20)	count bigint
1	[null]	1
2	BRONZE	4
3	GOLD	1
4	SILVER	1

18. Along with the assignment no. 17 try to retrieve the maximum used scholarship category



student/postgres@PostgreSQL 13

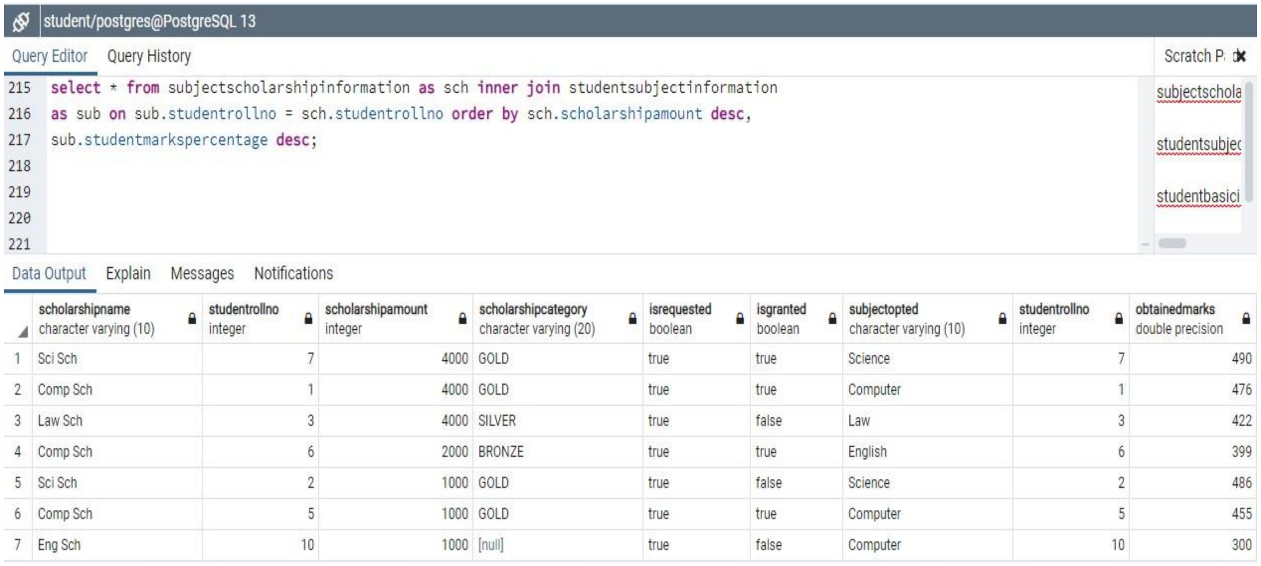
Query Editor Query History

```sql
select scholarshipcategory , count(*) as noofstudents from subjectscholarshipinformation
group by scholarshipcategory order by count(*) desc limit 1;
```

Data Output Explain Messages Notifications

	scholarshipcategory character varying (20)	noofstudents bigint
1	BRONZE	4

19. Retrieve the percentage of the students along with students detailed information who has scored the highest percentage along with availing the maximum scholarship amount



```
select * from subjectscholarshipinformation as sch inner join studentsubjectinformation
as sub on sub.studentrollno = sch.studentrollno order by sch.scholarshipamount desc,
sub.studentmarkspercentage desc;
```

	scholarshipname character varying (10)	studentrollno integer	scholarshipamount integer	scholarshipcategory character varying (20)	isrequested boolean	isgranted boolean	subjectopted character varying (10)	studentrollno integer	obtainedmarks double precision
1	Sci Sch	7	4000	GOLD	true	true	Science	7	490
2	Comp Sch	1	4000	GOLD	true	true	Computer	1	476
3	Law Sch	3	4000	SILVER	true	false	Law	3	422
4	Comp Sch	6	2000	BRONZE	true	true	English	6	399
5	Sci Sch	2	1000	GOLD	true	false	Science	2	486
6	Comp Sch	5	1000	GOLD	true	true	Computer	5	455
7	Eng Sch	10	1000	[null]	true	false	Computer	10	300

20. Difference between the Triggers, Stored Procedures, Views and Functions

Triggers:

- *Trigger is a stored procedure that runs automatically when a specific event happens (update, delete, insert) .*
- It can execute automatically based on the events
- *Triggers cannot take input as a parameter*
- *Triggers cannot return values.*

Stored Procedures:

- *They are the piece of code written in a block to perform a specific task when called.*
- *They can take input as a parameter.*
- *They can only return values as an OUT parameter.*

Functions:

- *They are same as stored procedures but can return values and can be used in an expression.*
-

Views:

- *Views are pseudo-tables that can be made from other tables by selecting any number of rows and columns from the table.*
- *They are usually made to retrieve frequent used data from the table, so that time to execute the query in the whole big table is reduced.*