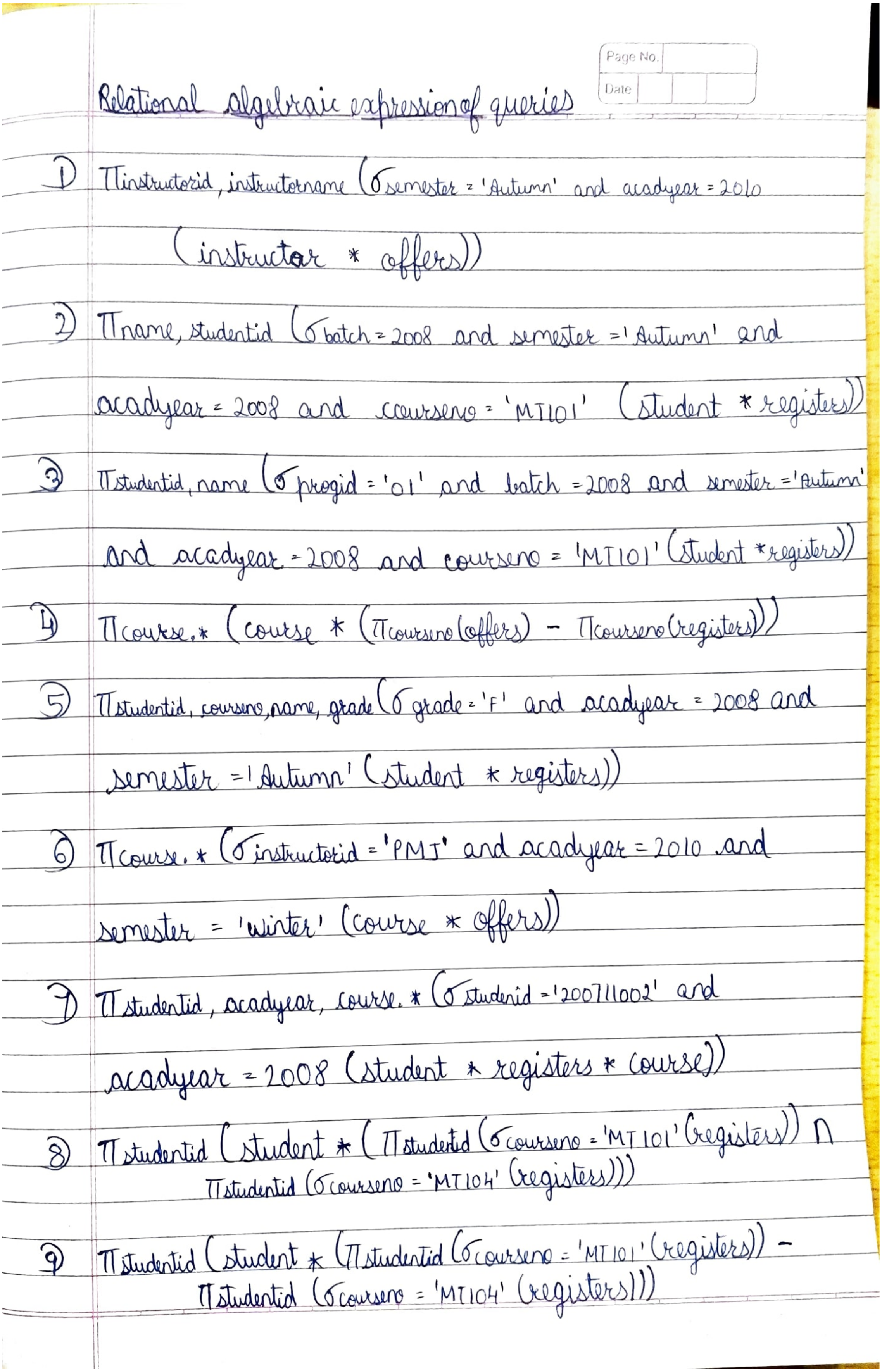
IT214 Lab 4 Report
Keyur Govrani
202101498

Contents

1 Relational algebraic expressions for all queries



Page No. Date

Relational algebraic expression of queries

1) $\Pi_{instructorid,\ instructorname}(\sigma_{semester\ =\ 'Autumn'\ and\ acadyear\ =\ 2010}$
$(instructor * offers))$

2) $\Pi_{name,\ studentid}(\sigma_{batch\ =\ 2008\ and\ semester\ =\ 'Autumn'\ and}$
$acadyear = 2008\ and\ ccourseno = 'MT101'\ (student * registers))$

3) $\Pi_{studentid,\ name}(\sigma_{progid\ =\ '01'\ and\ batch\ =\ 2008\ and\ semester\ =\ 'Autumn'}$
$and\ acadyear = 2008\ and\ courseno = 'MT101'(student * registers))$

4) $\Pi_{course.*}(course * (\Pi_{courseno}(offers) - \Pi_{courseno}(registers)))$

5) $\Pi_{studentid,\ courseno,\ name,\ grade}(\sigma_{grade\ =\ 'F'\ and\ acadyear\ =\ 2008\ and}$
$semester = 'Autumn'(student * registers))$

6) $\Pi_{course.*}(\sigma_{instructorid\ =\ 'PMJ'\ and\ acadyear\ =\ 2010\ and}$
$semester = 'winter'\ (course * offers))$

7) $\Pi_{studentid,\ acadyear,\ course.*}(\sigma_{studenid\ =\ '200711002'\ and}$
$acadyear = 2008\ (student * registers * course))$

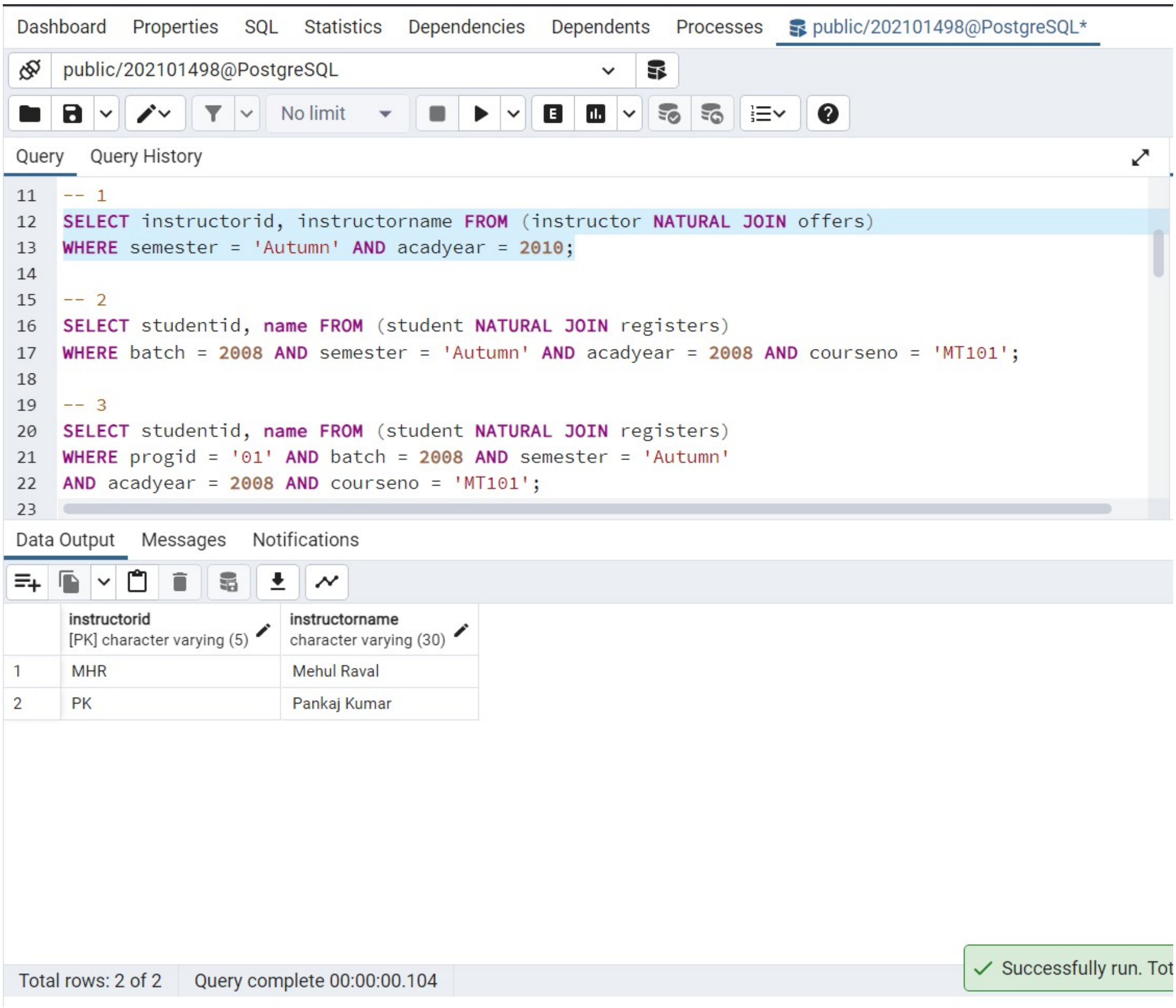
8) $\Pi_{studentid}(student * (\Pi_{studentid}(\sigma_{courseno\ =\ 'MT101'}(registers)) \cap$
$\Pi_{studentid}(\sigma_{courseno\ =\ 'MT104'}(registers))))$

9) $\Pi_{studentid}(student * (\Pi_{studentid}(\sigma_{courseno\ =\ 'MT101'}(registers)) -$
$\Pi_{studentid}(\sigma_{courseno\ =\ 'MT104'}(registers))))$

2 SQL statements for all queries

1. List Faculty (ID, Name) for all courses of Autumn'2010

```
SELECT instructorid, instructorname FROM
(instructor NATURAL JOIN offers)
WHERE semester = 'Autumn' AND acadyear = 2010;
```



```
-- 1
SELECT instructorid, instructorname FROM (instructor NATURAL JOIN offers)
WHERE semester = 'Autumn' AND acadyear = 2010;

-- 2
SELECT studentid, name FROM (student NATURAL JOIN registers)
WHERE batch = 2008 AND semester = 'Autumn' AND acadyear = 2008 AND courseno = 'MT101';

-- 3
SELECT studentid, name FROM (student NATURAL JOIN registers)
WHERE progid = '01' AND batch = 2008 AND semester = 'Autumn'
AND acadyear = 2008 AND courseno = 'MT101';
```

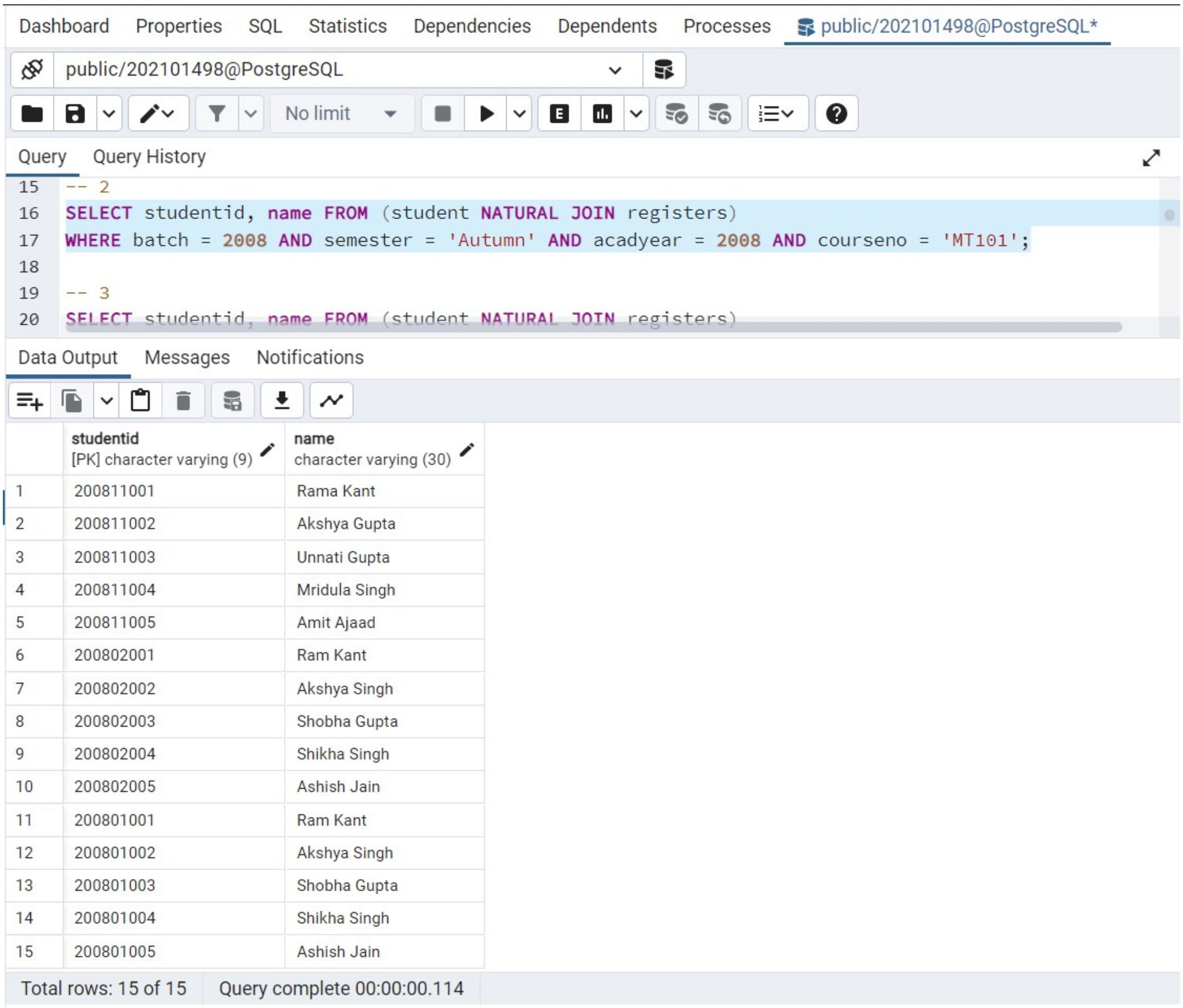
	instructorid [PK] character varying (5)	instructorname character varying (30)
1	MHR	Mehul Raval
2	PK	Pankaj Kumar

Total rows: 2 of 2   Query complete 00:00:00.104

✓ Successfully run. Tot

2. List Students (ID, Name) from batch 2008 registered for course MT101 in Autumn'2008.

```
SELECT studentid , name FROM (student NATURAL JOIN registers)
WHERE batch = 2008 AND semester = 'Autumn'
AND acadyear = 2008 AND courseno = 'MT101';
```



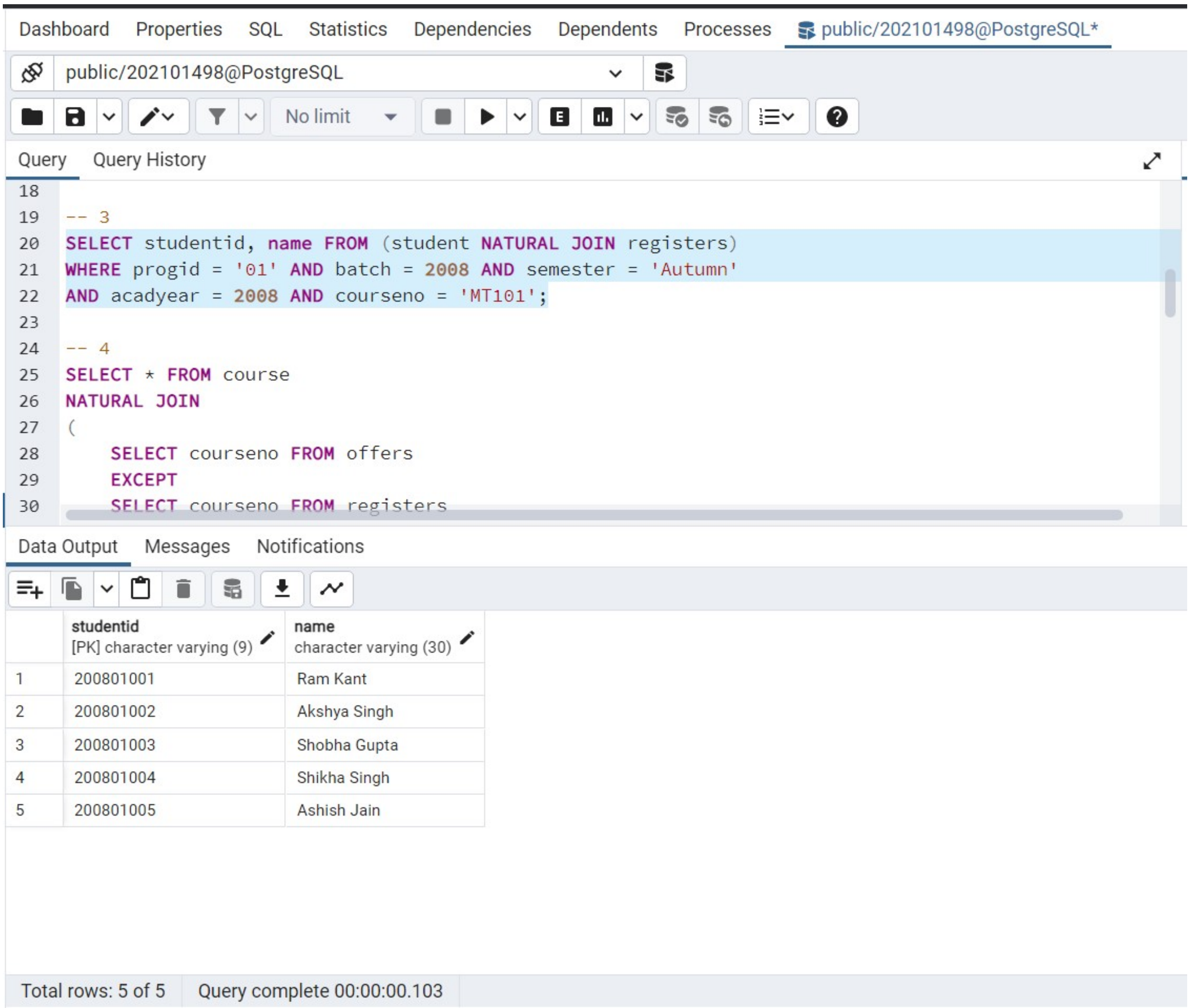
```
-- 2
SELECT studentid, name FROM (student NATURAL JOIN registers)
WHERE batch = 2008 AND semester = 'Autumn' AND acadyear = 2008 AND courseno = 'MT101';

-- 3
SELECT studentid, name FROM (student NATURAL JOIN registers)
```

	studentid [PK] character varying (9)	name character varying (30)
1	200811001	Rama Kant
2	200811002	Akshya Gupta
3	200811003	Unnati Gupta
4	200811004	Mridula Singh
5	200811005	Amit Ajaad
6	200802001	Ram Kant
7	200802002	Akshya Singh
8	200802003	Shobha Gupta
9	200802004	Shikha Singh
10	200802005	Ashish Jain
11	200801001	Ram Kant
12	200801002	Akshya Singh
13	200801003	Shobha Gupta
14	200801004	Shikha Singh
15	200801005	Ashish Jain

Total rows: 15 of 15 Query complete 00:00:00.114

3. List Students (ID, Name) from B Tech (progid='01') batch 2008 registered for course MT101 in Autumn'2008.

```
SELECT studentid, name FROM (student NATURAL JOIN registers)
WHERE progid = '01' AND batch = 2008
AND semester = 'Autumn' AND acadyear = 2008
AND courseno = 'MT101';
```



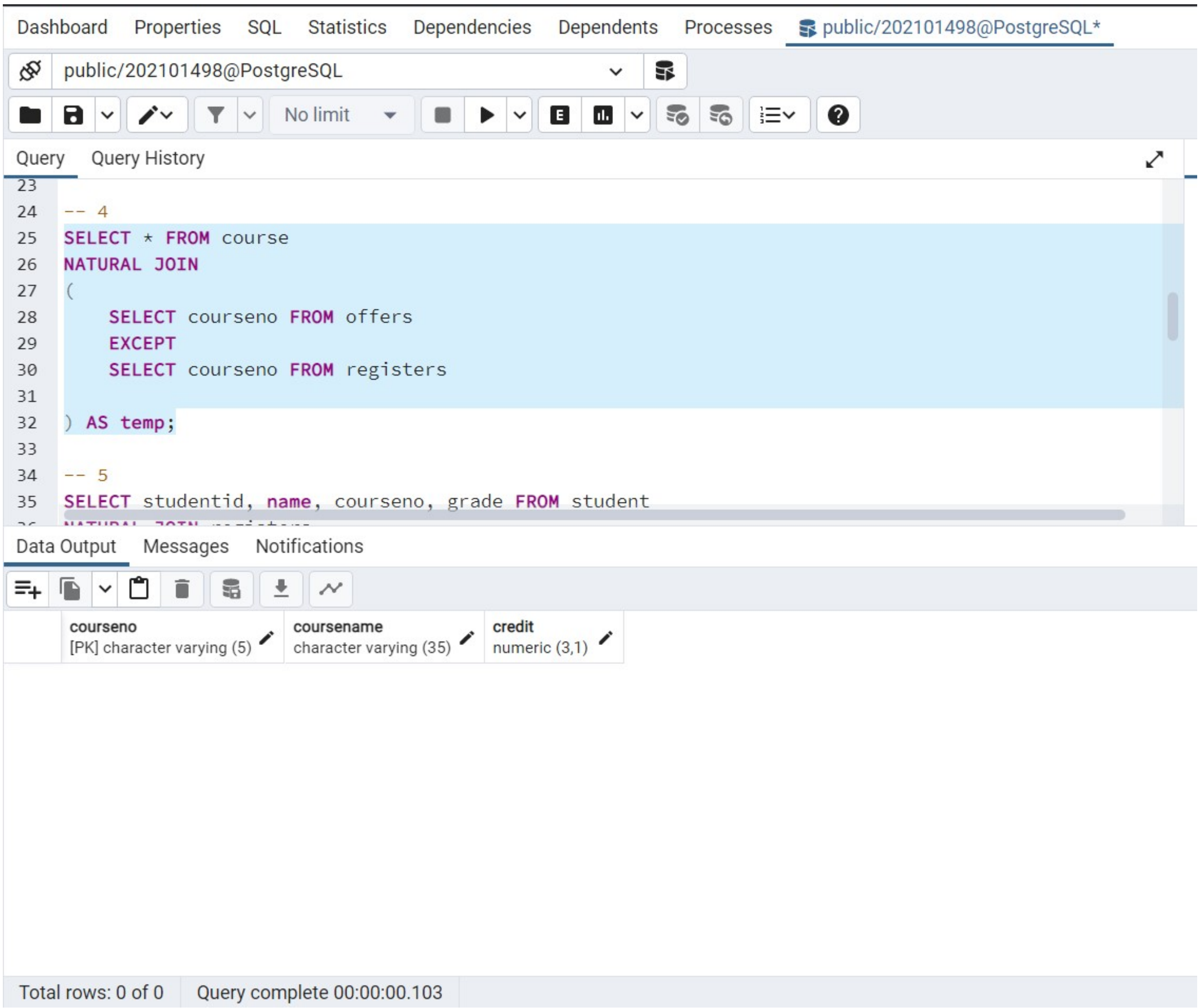
```

-- 3
SELECT studentid, name FROM (student NATURAL JOIN registers)
WHERE progid = '01' AND batch = 2008 AND semester = 'Autumn'
AND acadyear = 2008 AND courseno = 'MT101';

-- 4
SELECT * FROM course
NATURAL JOIN
(
    SELECT courseno FROM offers
    EXCEPT
    SELECT courseno FROM registers
```

	studentid [PK] character varying (9)	name character varying (30)
1	200801001	Ram Kant
2	200801002	Akshya Singh
3	200801003	Shobha Gupta
4	200801004	Shikha Singh
5	200801005	Ashish Jain

Total rows: 5 of 5 Query complete 00:00:00.103

4. List courses that were offered but students were not registered in those offerings

```
SELECT * FROM course
NATURAL JOIN
(
    SELECT courseno FROM offers
    EXCEPT
    SELECT courseno FROM registers

) AS temp;
```



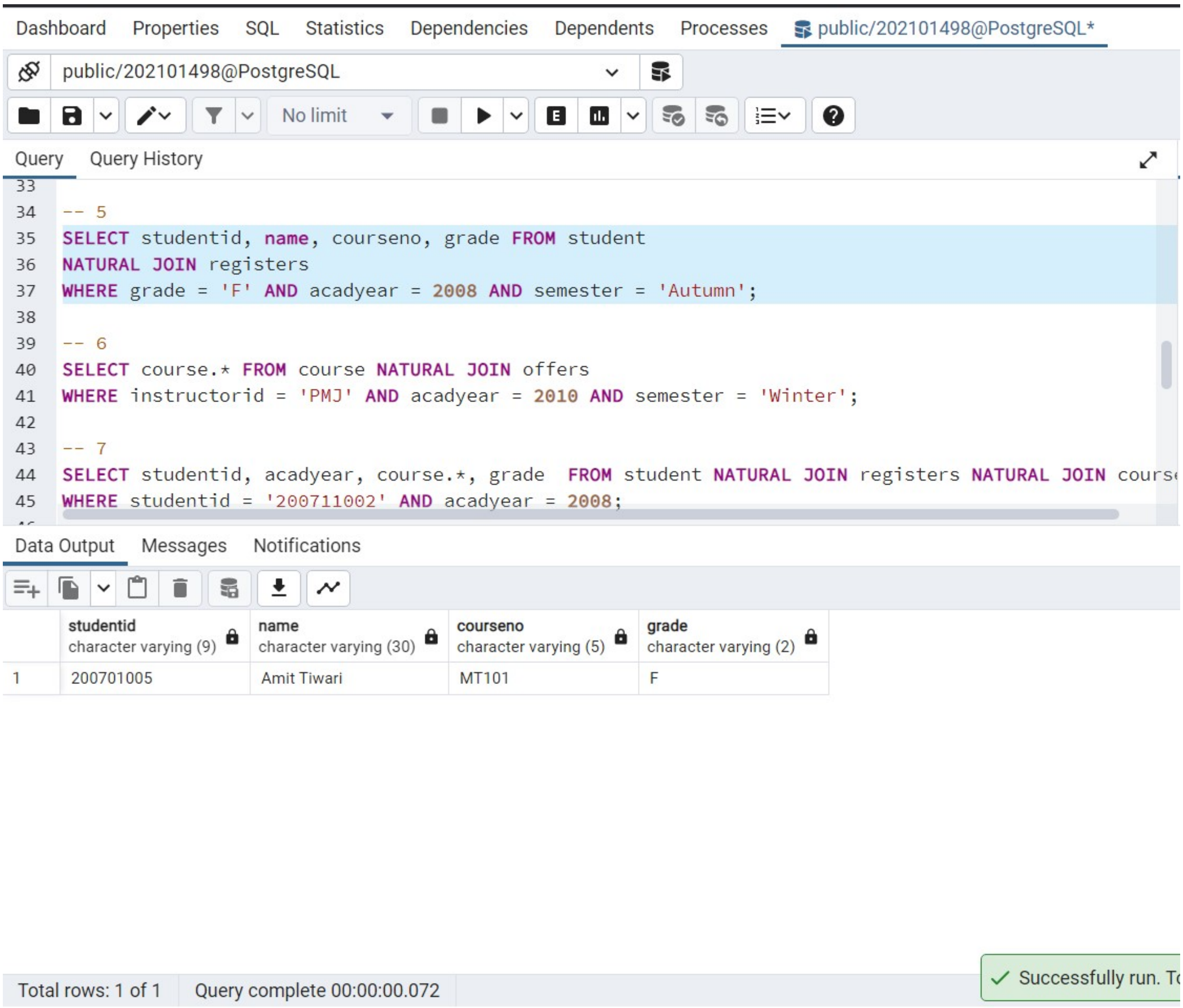
```
-- 4
SELECT * FROM course
NATURAL JOIN
(
    SELECT courseno FROM offers
    EXCEPT
    SELECT courseno FROM registers

) AS temp;

-- 5
SELECT studentid, name, courseno, grade FROM student
NATURAL JOIN registers
```

courseno [PK] character varying (5)	coursename character varying (35)	credit numeric (3,1)

Total rows: 0 of 0   Query complete 00:00:00.103

5. List students (id, name, courseno, grade) who got ‘F’ grade in Autumn’2008

```
SELECT studentid , name , courseno , grade FROM student
NATURAL JOIN registers
WHERE grade = 'F' AND acadyear = 2008 AND semester = 'Autumn';
```



```
-- 5
SELECT studentid, name, courseno, grade FROM student
NATURAL JOIN registers
WHERE grade = 'F' AND acadyear = 2008 AND semester = 'Autumn';

-- 6
SELECT course.* FROM course NATURAL JOIN offers
WHERE instructorid = 'PMJ' AND acadyear = 2010 AND semester = 'Winter';

-- 7
SELECT studentid, acadyear, course.*, grade  FROM student NATURAL JOIN registers NATURAL JOIN cours
WHERE studentid = '200711002' AND acadyear = 2008;
```

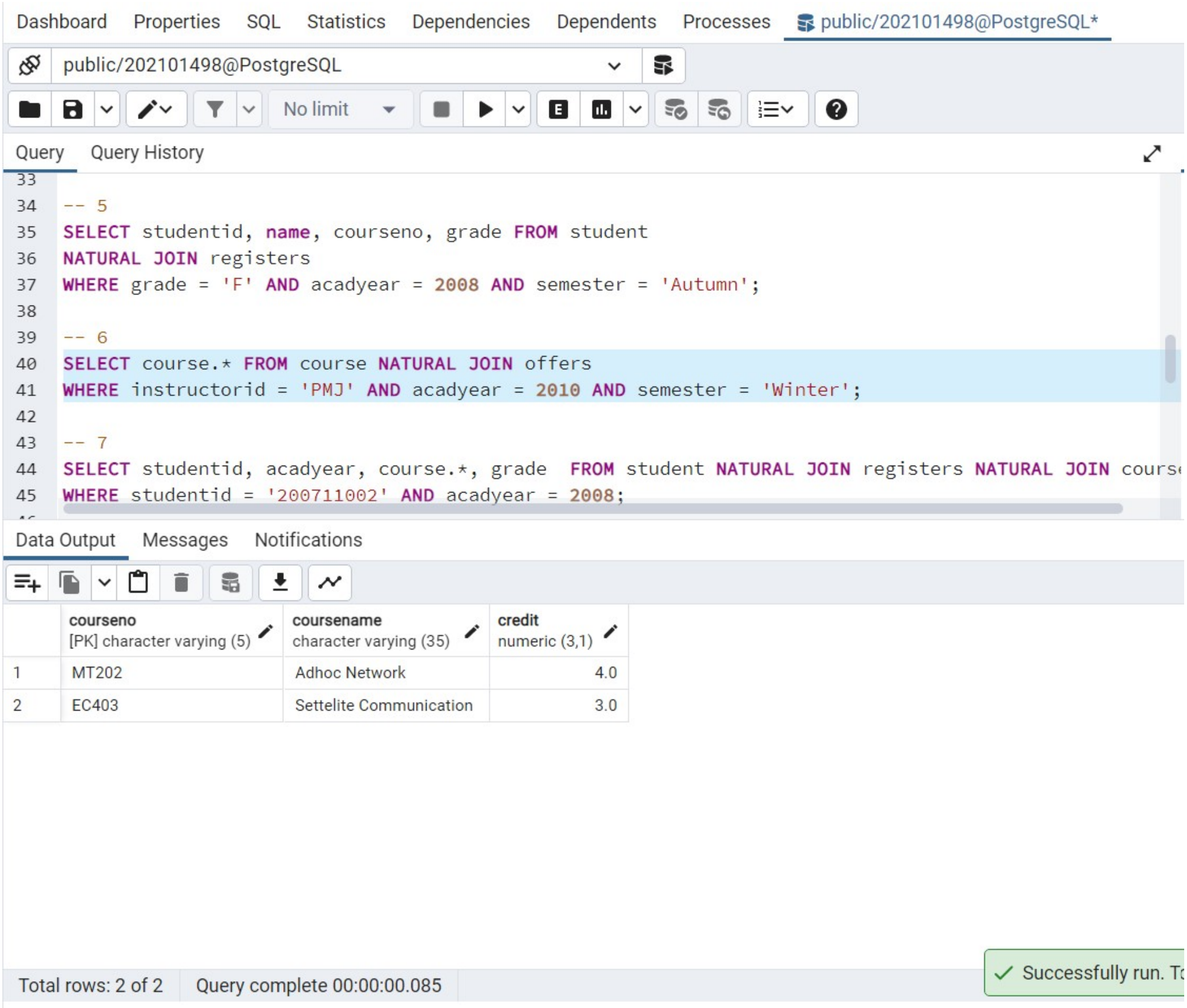
	studentid character varying (9)	name character varying (30)	courseno character varying (5)	grade character varying (2)
1	200701005	Amit Tiwari	MT101	F

Total rows: 1 of 1 Query complete 00:00:00.072

✓ Successfully run. To

6. List Courses (Course No, Title, Credits) offered by Instructor (ID=‘PMJ’) in semester Winter’2010.

```
SELECT course.* FROM course NATURAL JOIN offers
WHERE instructorid = 'PMJ' AND acadyear = 2010
AND semester = 'Winter';
```



```
-- 5
SELECT studentid, name, courseno, grade FROM student
NATURAL JOIN registers
WHERE grade = 'F' AND acadyear = 2008 AND semester = 'Autumn';

-- 6
SELECT course.* FROM course NATURAL JOIN offers
WHERE instructorid = 'PMJ' AND acadyear = 2010 AND semester = 'Winter';

-- 7
SELECT studentid, acadyear, course.*, grade  FROM student NATURAL JOIN registers NATURAL JOIN cours
WHERE studentid = '200711002' AND acadyear = 2008;
```

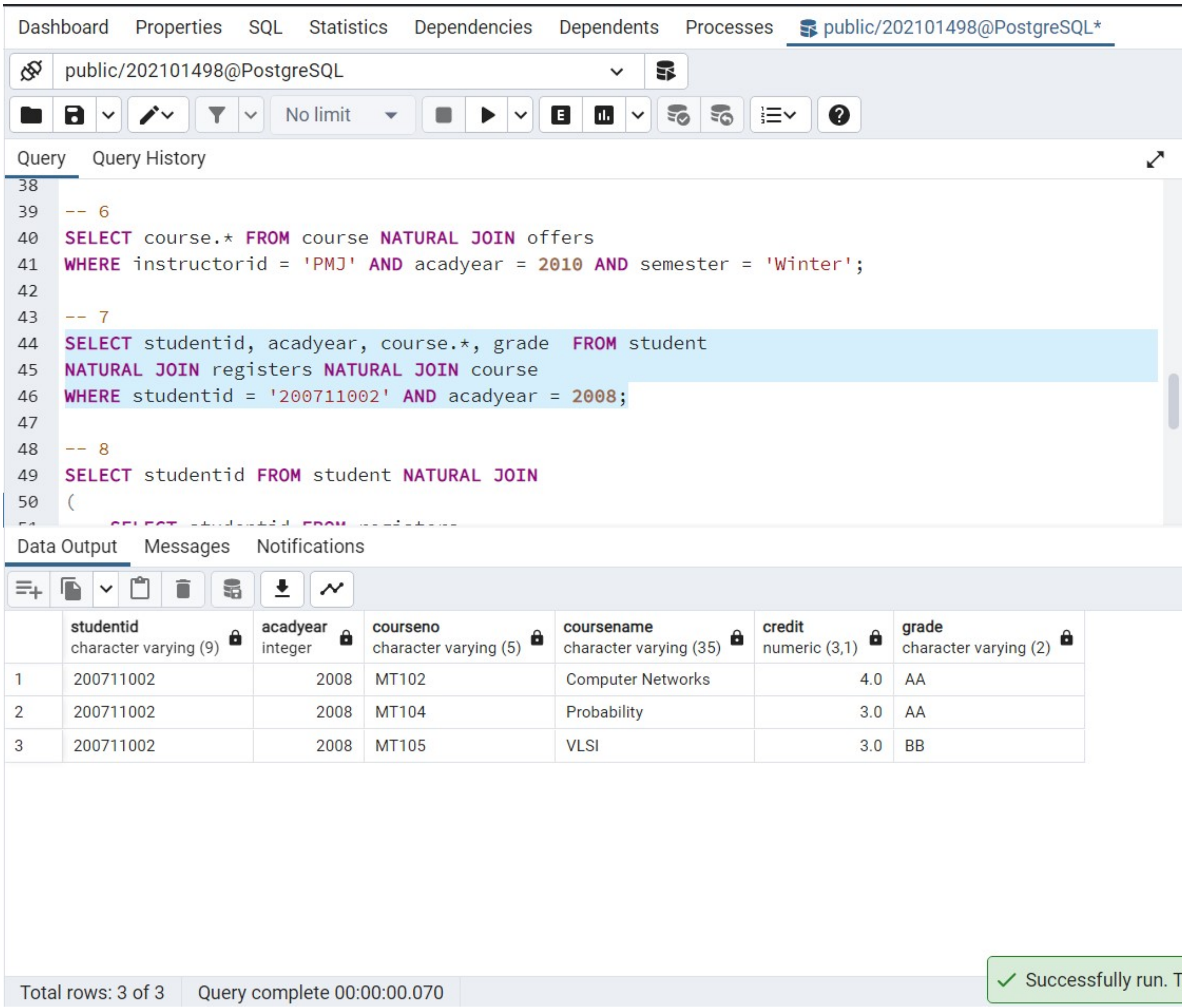
	courseno [PK] character varying (5)	coursename character varying (35)	credit numeric (3,1)
1	MT202	Adhoc Network	4.0
2	EC403	Settelite Communication	3.0

Total rows: 2 of 2   Query complete 00:00:00.085

✓ Successfully run. T

7. Produce transcript of student ‘200711002’ for Academic year 2008-09 List Course No, Course Name, Course Credit, Grade

```sql
SELECT studentid, acadyear, course.*, grade FROM student
NATURAL JOIN registers NATURAL JOIN course
WHERE studentid = '200711002' AND acadyear = 2008;
```



```sql

-- 6
SELECT course.* FROM course NATURAL JOIN offers
WHERE instructorid = 'PMJ' AND acadyear = 2010 AND semester = 'Winter';

-- 7
SELECT studentid, acadyear, course.*, grade  FROM student
NATURAL JOIN registers NATURAL JOIN course
WHERE studentid = '200711002' AND acadyear = 2008;

-- 8
SELECT studentid FROM student NATURAL JOIN
(
    SELECT studentid FROM registers
```

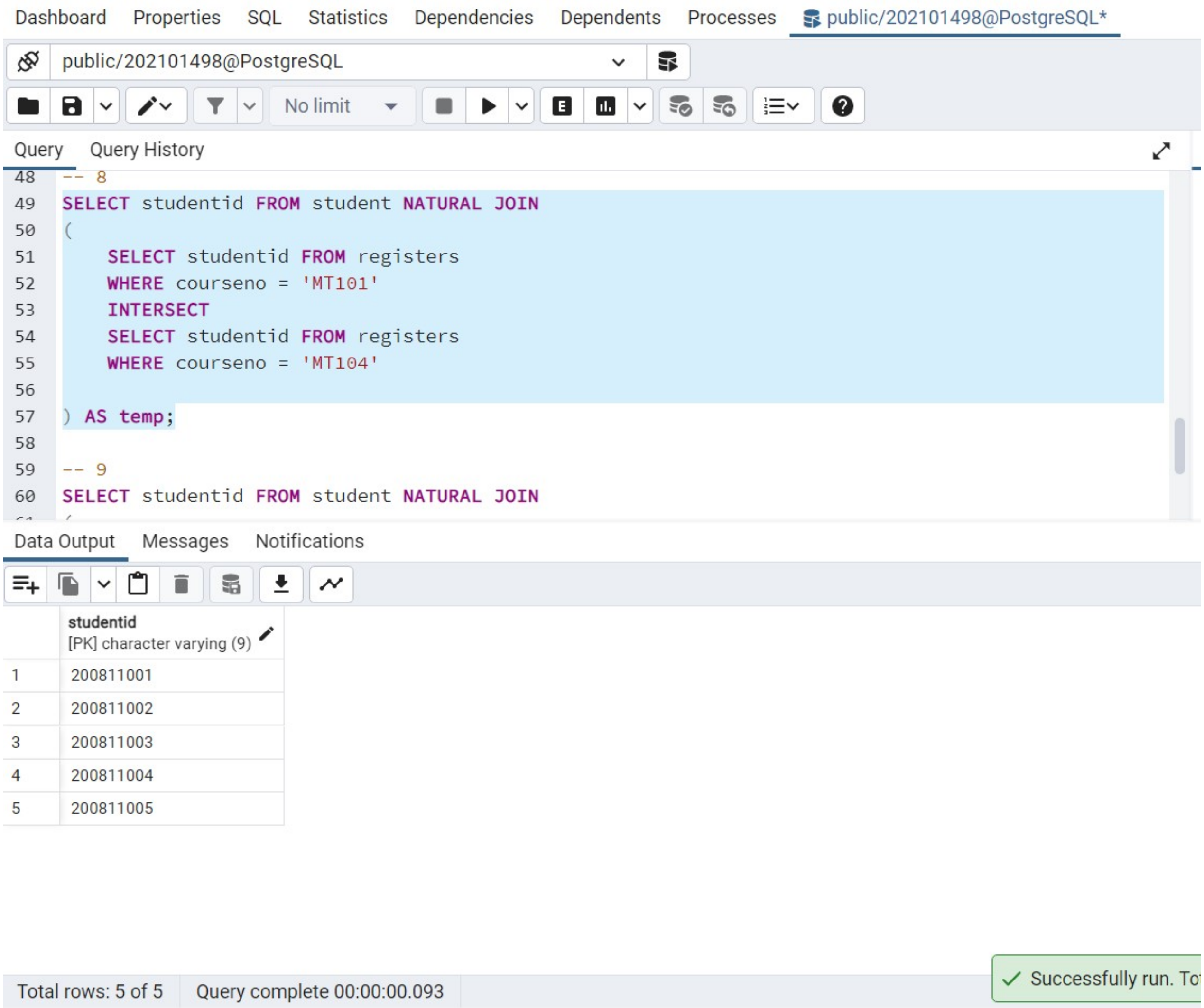
	studentid character varying (9)	acadyear integer	courseno character varying (5)	coursename character varying (35)	credit numeric (3,1)	grade character varying (2)
1	200711002	2008	MT102	Computer Networks	4.0	AA
2	200711002	2008	MT104	Probability	3.0	AA
3	200711002	2008	MT105	VLSI	3.0	BB

Total rows: 3 of 3 Query complete 00:00:00.070

✓ Successfully run. T

8. List ID of students who have taken both courses - ‘MT101’ AND ‘MT104’.

```
SELECT studentid FROM student NATURAL JOIN
(
    SELECT studentid FROM registers
    WHERE courseno = 'MT101'

    INTERSECT

    SELECT studentid FROM registers
    WHERE courseno = 'MT104'

) AS temp;
```



```
-- 8
SELECT studentid FROM student NATURAL JOIN
(
    SELECT studentid FROM registers
    WHERE courseno = 'MT101'
    INTERSECT
    SELECT studentid FROM registers
    WHERE courseno = 'MT104'

) AS temp;

-- 9
SELECT studentid FROM student NATURAL JOIN
```

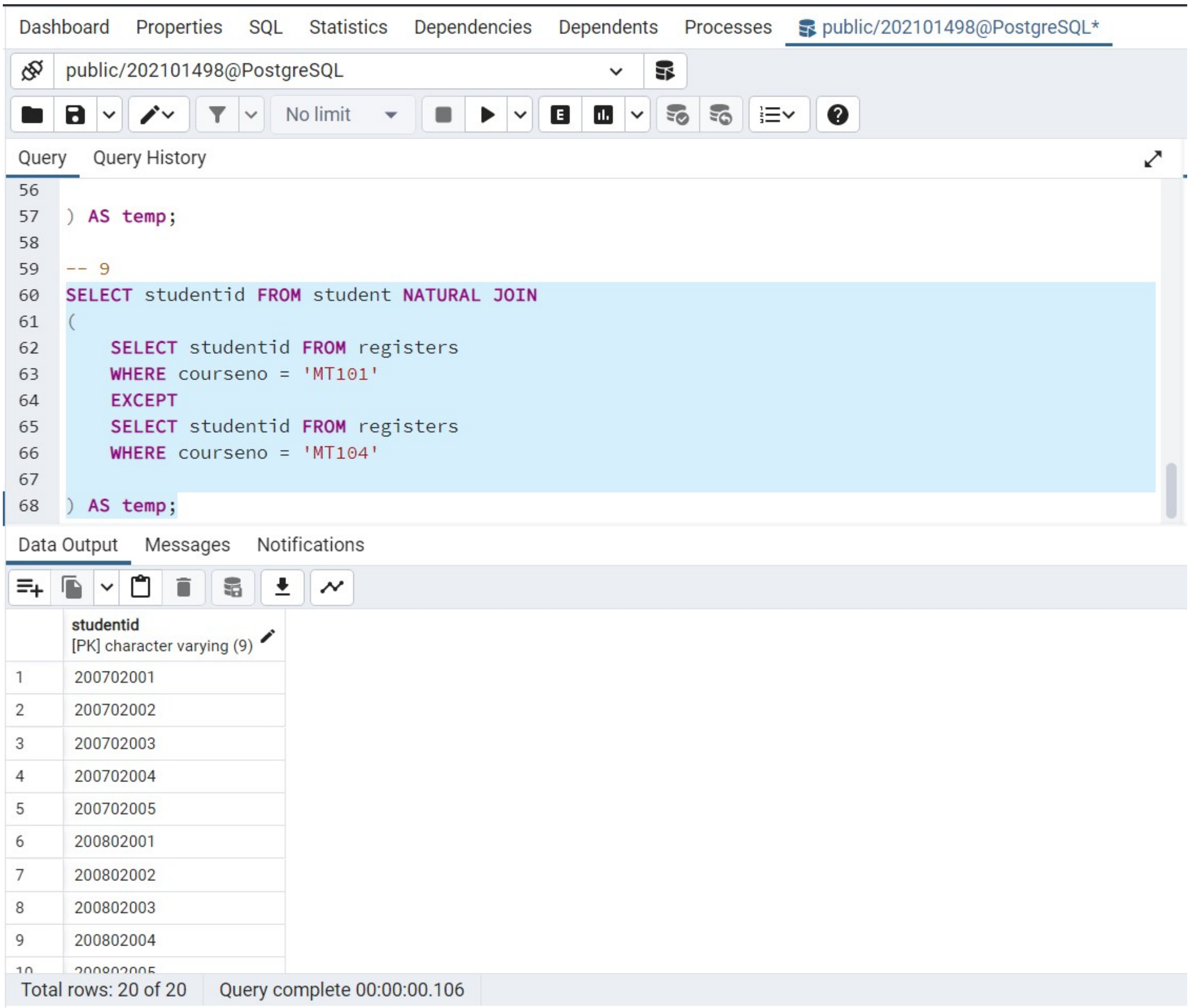
	studentid [PK] character varying (9)
1	200811001
2	200811002
3	200811003
4	200811004
5	200811005

Total rows: 5 of 5 Query complete 00:00:00.093

✓ Successfully run. To

9. List ID of students who have taken ‘MT101’ but not ‘MT104’

```sql
SELECT studentid FROM student NATURAL JOIN
(
    SELECT studentid FROM registers
    WHERE courseno = 'MT101'

    EXCEPT

    SELECT studentid FROM registers
    WHERE courseno = 'MT104'

) AS temp;
```



```sql

) AS temp;

-- 9
SELECT studentid FROM student NATURAL JOIN
(
    SELECT studentid FROM registers
    WHERE courseno = 'MT101'
    EXCEPT
    SELECT studentid FROM registers
    WHERE courseno = 'MT104'

) AS temp;
```

	studentid [PK] character varying (9)
1	200702001
2	200702002
3	200702003
4	200702004
5	200702005
6	200802001
7	200802002
8	200802003
9	200802004
10	200802005

Total rows: 20 of 20   Query complete 00:00:00.106