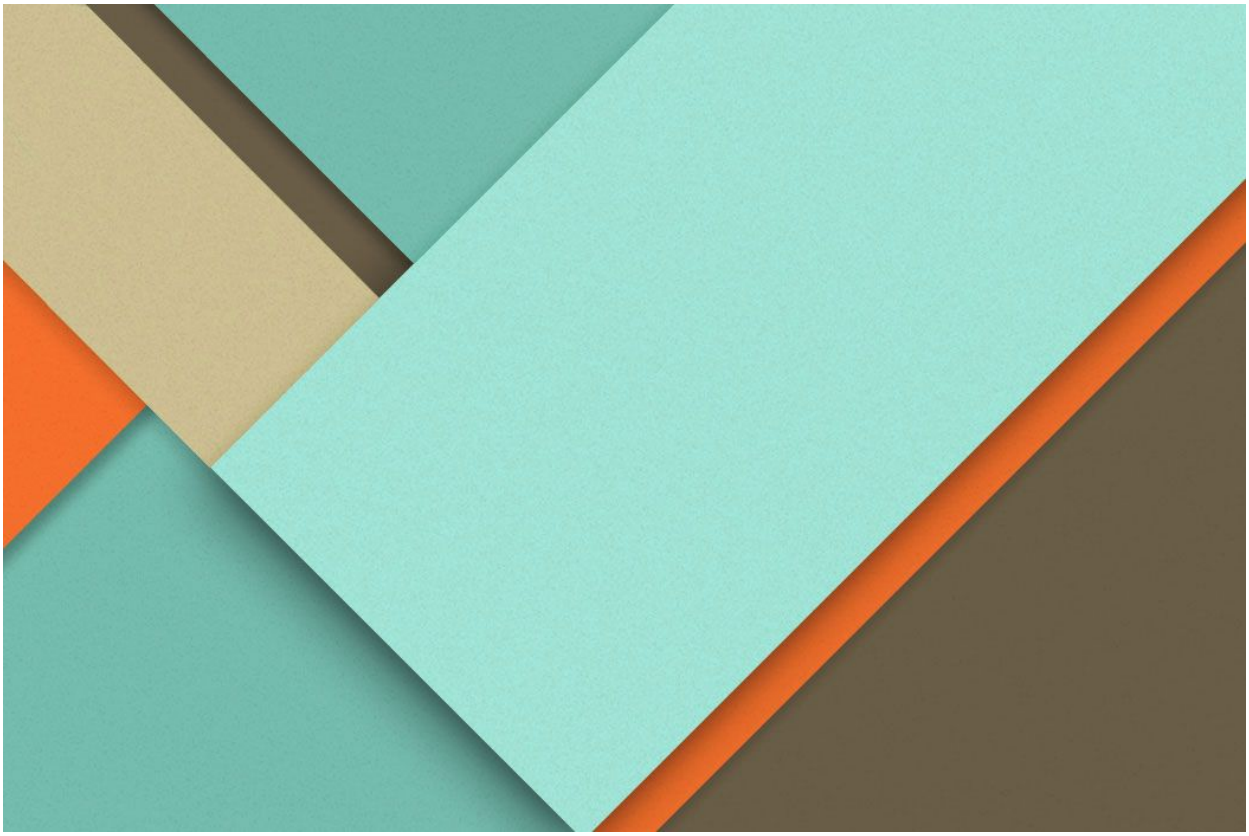


SEAT ALLOCATION DBMS

Anjali Priya

Shashank Gupta

Prajwal Rothe

Saurabh Tiwari

- **STUDENTS** (s_id, f_name, l_name,marks, state, city,gender)
  - **PRIMARY KEY:**
    - **s_id**
  - **FOREIGN KEY:**
    - **none**

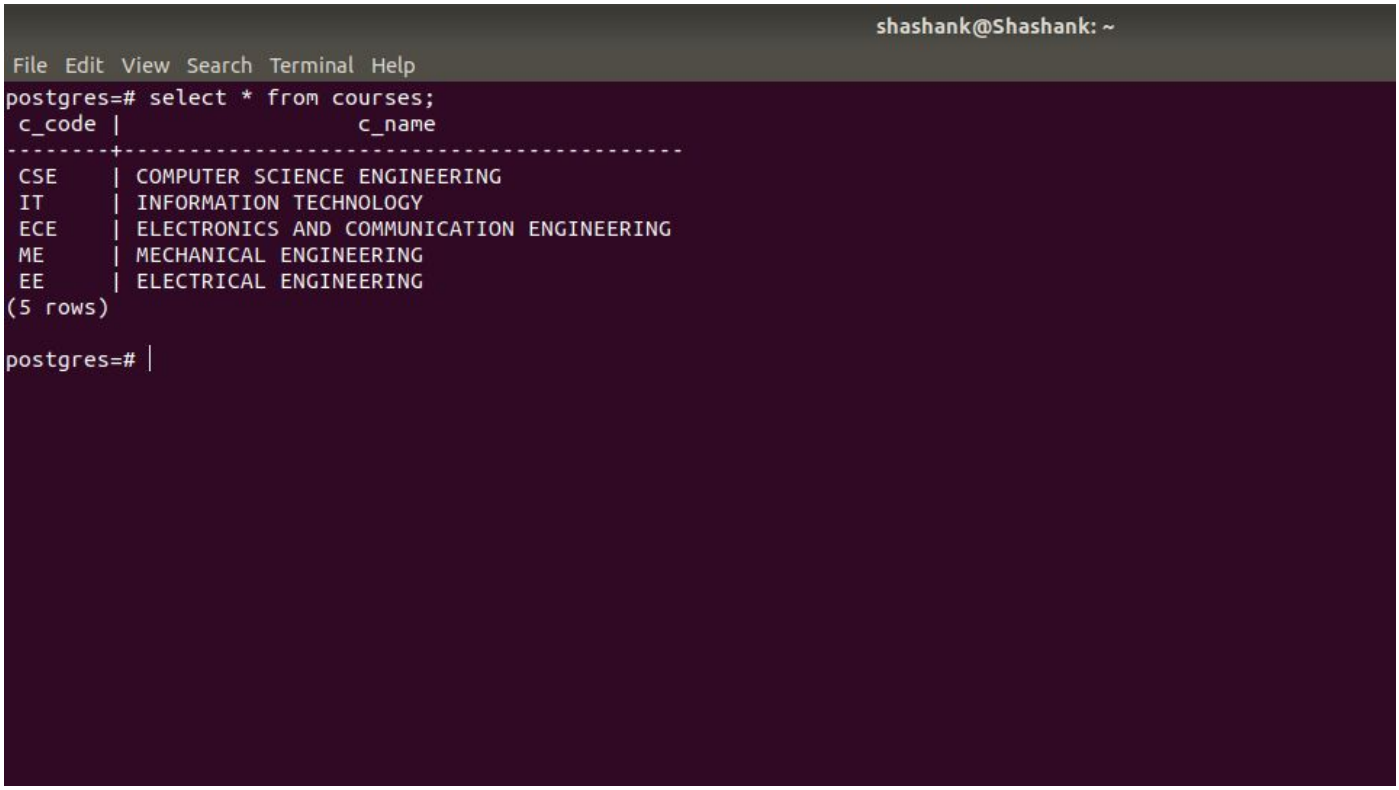
File Edit View Search Terminal Help

```
postgres=# select * from students;
      s_id       |  f_name   |  l_name   | marks |     state      |    city     | gender
-----------------+-----------+-----------+-------+----------------+-------------+--------
 20171           | ABHISHEK  | SHARMA    |   240 | UTTAR PRADESH  | PRAYAGRAJ   | M
 20172           | AAYUSH    | DHEEMER   |   230 | MADHYA PRADESH | GWALIOR     | M
 20173           | AMAN      | SINGH     |   190 | GUJARAT        | SURAT       | M
 20174           | SHASHANK  | GUPTA     |   180 | MADHYA PRADESH | BHOPAL      | M
 20175           | SAURABH   | SINGH     |   188 | UTTAR PRADESH  | GORAKHPUR   | M
 20176           | DEV       | DK B0SE   |   155 | JHARKHAND      | RANCHI      | M
 20177           | ANJALI    | PRIYA     |   177 | BIHAR          | PATNA       | F
 20178           | VIKAS     | sharma    |   173 | RAJASTHAN      | JAIPUR      | M
 20179           | PRAJWAL   | ROTHE     |   178 | MAHARASHTRA    | MUMBAI      | M
 20180           | BHAVESH   | PATEL     |   188 | MADHYA PRADESH | BHUSAVAL    | M
 20181           | MEENAL    | SALVI     |   175 | RAJASTHAN      | UDAIPUR     | F
 20182           | ANUSHA    | GUPTA     |   152 | MADHYA PRADESH | JABALPUR    | F
 20183           | VAISHALI  | DUBEY     |   148 | UTTAR PRADESH  | BANARAS     | F
 20184           | SHIVANGI  | KAPADIA   |   163 | GUJARAT        | GANDHINAGAR | F
 20185           | KSHITIZ   | GANGWAR   |   128 | DELHI          | GURUGRAM    | M
 20186           | SAWAI     | JAIN      |   179 | TAMILNADU      | KANCHIPURAM | M
 20187           | PREETI    | YADAV     |   229 | UTTAR PRADESH  | LUCKNOW     | F
 20188           | KESHAV    | PUROHIT   |   185 | MAHARASHTRA    | MUMBAI      | M
 20189           | PRAKHAR   | GUPTA     |   166 | CHHATISGARH    | RAIPUR      | M
 20190           | JOSHUA    | PODUKU    |   220 | MAHARASHTRA    | PUNE        | M
 20191           | VAIDEHI   | VAISHNAV  |   191 | GUJARAT        | AHMEDABAD   | F
 20192           | SHUBHAM   | SHARMA    |   100 | UTTAR PRADESH  | FARUKHABAD  | M
 20193           | ANUPMA    | GUPTA     |    80 | UTTAR PRADESH  | AGRA        | F
 20194           | ALOK      | PANCHAL   |    97 | MADHYA PRADESH | JABALPUR    | M
(24 rows)

postgres=#
```

- **INSTITUTE** (inst_id, iname, type,city,state)
    - **PRIMARY KEY:**
        - **ins_id**
    - **FOREIGN KEY:**
        - **None**

```
File  Edit  View  Search  Terminal  Help
postgres=# select * from institute;
 inst_id |      iname       | type |      city      |     state
---------+------------------+------+----------------+---------------
 101     | IIT BOMBAY       | IIT  | MUMBAI         | MAHARASHTRA
 102     | IIT DELHI        | IIT  | DELHI          | DELHI
 103     | IIT KHARAGPUR    | IIT  | KHARAGPUR      | WEST BENGAL
 104     | IIT KANPUR       | IIT  | KANPUR         | UTTAR PRADESH
 105     | IIT BHU          | IIT  | VARANASI       | UTTAR PRADESH
 106     | IIT PATNA        | IIT  | PATANA         | BIHAR
 107     | IIT ROORKEE      | IIT  | ROORKEE        | UTTARAKHAND
 108     | IIT ISM DHANBAD  | IIT  | DHANBAD        | JHARKHAND
 109     | IIT HYDERABAD    | IIT  | HYDERABAD      | TELANGANA
 110     | IIT GANDHINAGAR  | IIT  | GANDHINAGAR    | GUJRAT
 201     | NIT TRICHY       | NIT  | TIRUCHIRAPALLI | TAMILNADU
 202     | SVNIT SURAT      | NIT  | SURAT          | GUJRAT
 206     | MANIT BHOPAL     | NIT  | BHOPAL         | MADHYA PRADESH
 203     | VNIT NAGPUR      | NIT  | NAGPUR         | MAHARASHTRA
 204     | NIT WARANGAL     | NIT  | WARANGAL       | TELANGANA
 205     | NIT ROURKELA     | NIT  | ROURKELA       | ODISHA
 301     | IIIT VADODARA    | IIIT | GANDHINAGAR    | GUJRAT
 302     | IIIT GWALIOR     | IIIT | GWALIOR        | MADHYA PRADESH
 303     | IIIT PUNE        | IIIT | PUNE           | MAHARASHTRA
 304     | IIIT KANCHIPURAM | IIIT | KANCHIPURAM    | TAMILNADU
 305     | IIIT ALLAHABAD   | IIIT | PRAYAGRAJ      | UTTAR PRADESH
(21 rows)

postgres=#
```

- **COURSES** (c_code, c_name)
  - **PRIMARY KEY:**
    - **c_code**
  - **FOREIGN KEY:**
    - **none**



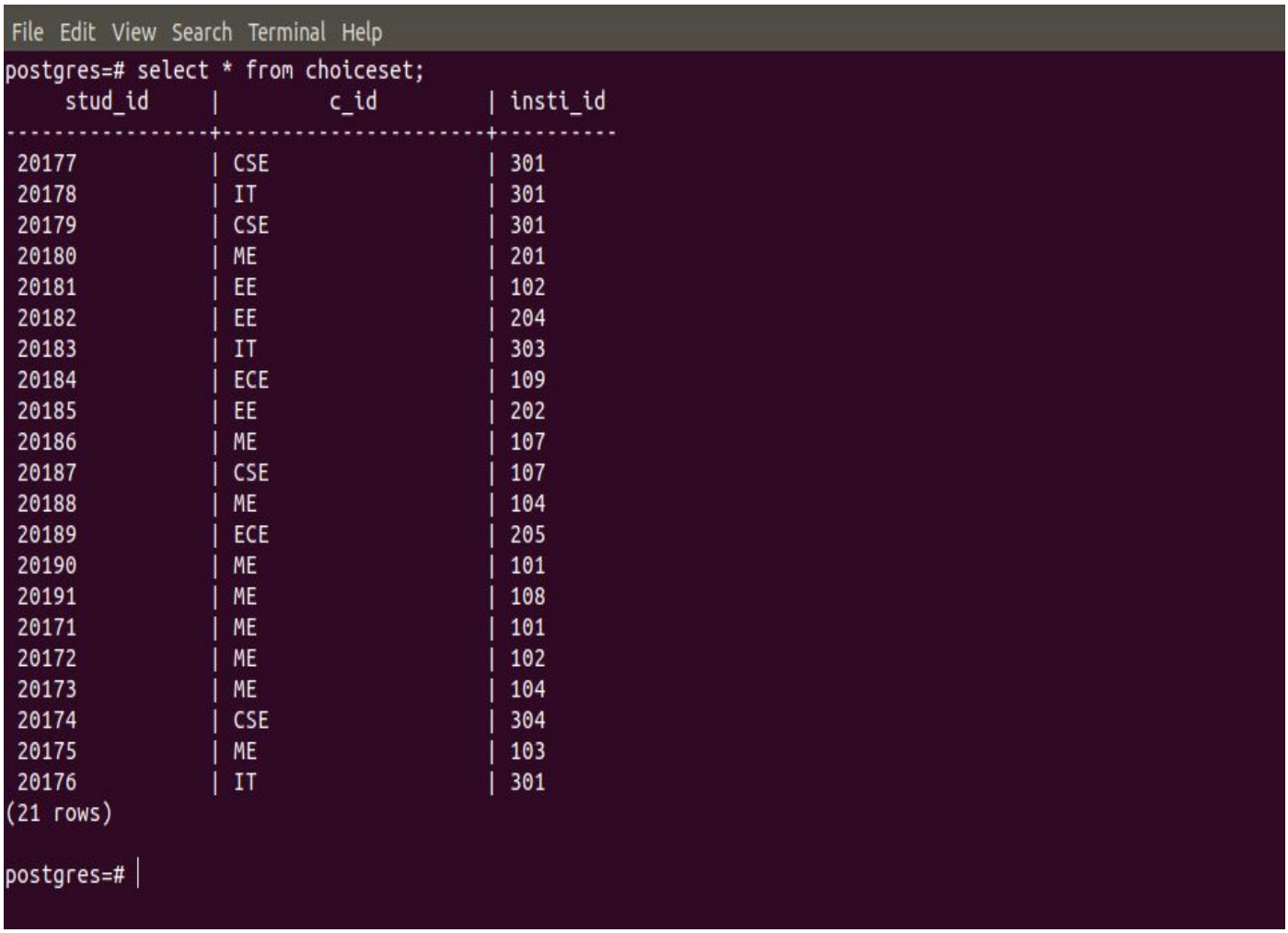
- **REGISTERS** (stu_id, cour_id, ins_id,preference,reg_date)
  - **PRIMARY KEY :**
    - **stu_id, cour_id, ins_id**
  - **FOREIGN KEY:**
    - **{cour_id , ins_id } reference from offers {cs_id, inst_id}**
    - **{stu_id} reference from students{s_id}**

File Edit View Search Terminal Help

stu_id	cour_id	ins_id	preference	reg_date
20171	CSE	101	1	2017-06-15
20172	ME	101	1	2017-06-17
20172	ME	102	2	2017-06-17
20173	CSE	104	1	2017-06-17
20173	ME	104	2	2017-06-17
20174	CSE	305	1	2017-06-16
20174	CSE	304	2	2017-06-16
20175	ME	102	1	2017-06-16
20175	ME	103	2	2017-06-16
20176	EE	103	1	2017-06-17
20176	IT	301	2	2017-06-17
20177	CSE	304	1	2017-06-17
20177	CSE	301	2	2017-06-17
20178	CSE	204	1	2017-06-15
20178	IT	301	2	2017-06-15
20179	CSE	301	2	2017-06-15
20180	CSE	202	1	2017-06-16
20180	ME	201	2	2017-06-16
20181	ME	104	1	2017-06-17
20181	EE	102	2	2017-06-17
20182	ECE	104	1	2017-06-15
20182	EE	204	2	2017-06-15
20183	ECE	201	1	2017-06-16
20183	IT	303	2	2017-06-16
20184	CSE	109	1	2017-06-15
20184	ECE	109	2	2017-06-15
20185	ECE	305	1	2017-06-16
20185	EE	202	2	2017-06-16
20186	CSE	107	1	2017-06-15
20186	ME	107	2	2017-06-15
20187	CSE	101	1	2017-06-17
20187	CSE	107	2	2017-06-17

:

- **CHOICE SET** (stud_id , c_id, insti_id)
  - **PRIMARY KEY:**
    - **stud_id,c_id,insti_id**
  - **FOREIGN KEY:**
    - **{stud_id,c_id,insti_id} reference from registers {stu_id, cour_id, ins_id}**



```
File  Edit  View  Search  Terminal  Help
postgres=# select * from choiceset;
     stud_id     |         c_id         | insti_id
-----------------+----------------------+----------
 20177           | CSE                  | 301
 20178           | IT                   | 301
 20179           | CSE                  | 301
 20180           | ME                   | 201
 20181           | EE                   | 102
 20182           | EE                   | 204
 20183           | IT                   | 303
 20184           | ECE                  | 109
 20185           | EE                   | 202
 20186           | ME                   | 107
 20187           | CSE                  | 107
 20188           | ME                   | 104
 20189           | ECE                  | 205
 20190           | ME                   | 101
 20191           | ME                   | 108
 20171           | ME                   | 101
 20172           | ME                   | 102
 20173           | ME                   | 104
 20174           | CSE                  | 304
 20175           | ME                   | 103
 20176           | IT                   | 301
(21 rows)

postgres=#
```

- **ADMITTED**

  STUDENT(adm_date,stud_id,c_id,ins_id)
  - **PRIMARY KEY:**
    - **{stud_id,c_id,ins_id,adm_date}**
  - **FOREIGN KEY:**
    - **{stud_id,c_id,ins_id} reference from choice set {stud_id,c_id,insti_id}**

```
File  Edit  View  Search  Terminal  Help
postgres=# select * from admitted;
  adm_date  |     stud_id     | c_id | ins_id
------------+-----------------+------+--------
 2017-09-19 | 20171           | ME   | 101
 2017-09-19 | 20172           | ME   | 102
 2017-09-20 | 20173           | ME   | 104
 2017-09-25 | 20174           | CSE  | 304
 2017-09-05 | 20175           | ME   | 103
 2017-09-09 | 20176           | IT   | 301
 2017-09-13 | 20177           | CSE  | 301
 2017-09-22 | 20178           | IT   | 301
 2017-09-07 | 20179           | CSE  | 301
 2017-09-28 | 20180           | ME   | 201
 2017-09-12 | 20181           | EE   | 102
 2017-09-15 | 20182           | EE   | 204
 2017-09-15 | 20183           | IT   | 303
 2017-09-03 | 20184           | ECE  | 109
 2017-09-18 | 20185           | EE   | 202
 2017-09-03 | 20186           | ME   | 107
 2017-09-03 | 20187           | CSE  | 107
 2017-09-03 | 20188           | ME   | 104
(18 rows)

postgres=#
```

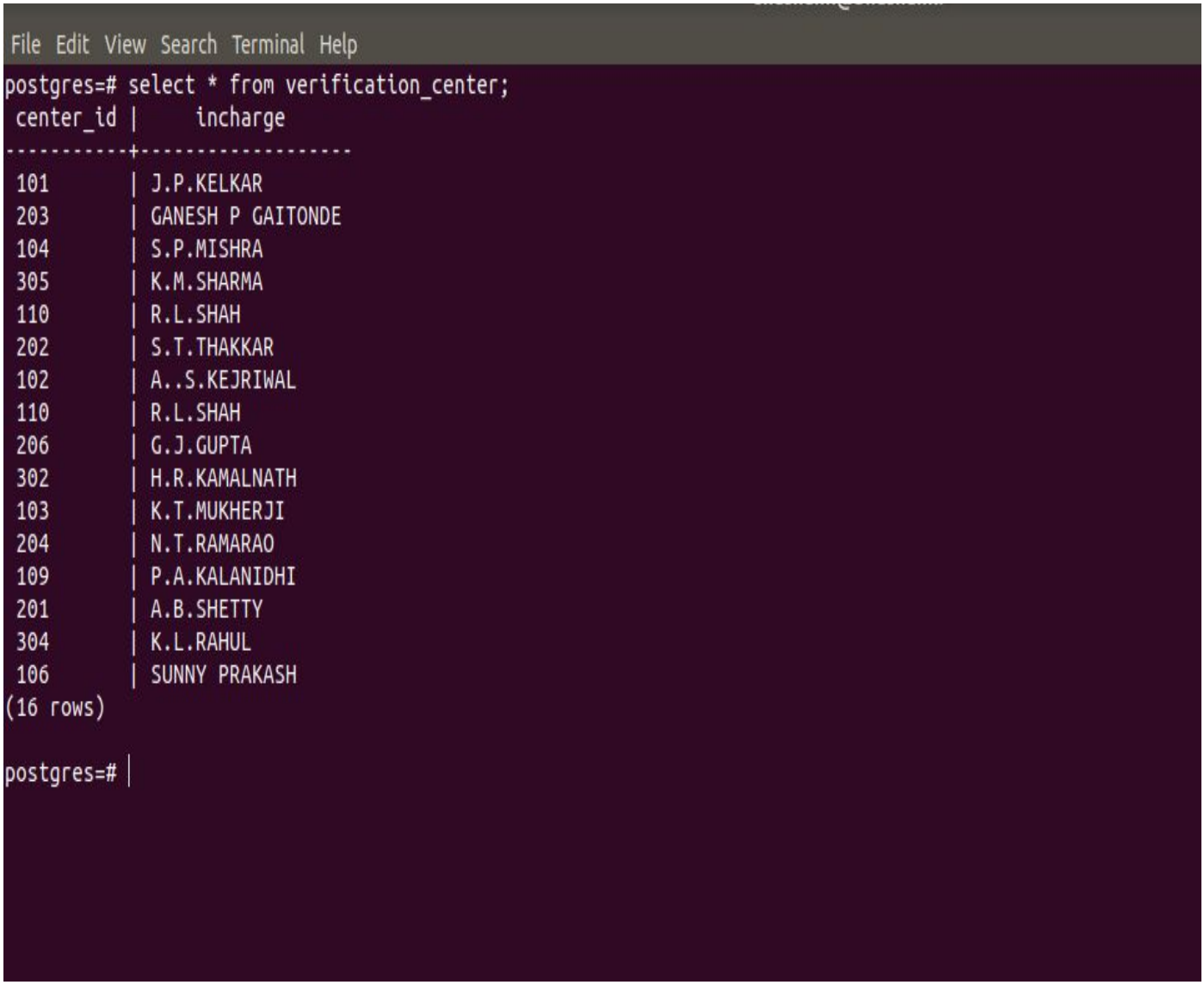
- **OFFERS** (cs_id ,inst_id, total_seats,cutoff)
  - **PRIMARY KEY :**
    - **{cs_id, inst_id}**
  - **FOREIGN KEY:**
    - **{cs_id} reference from course {c_code}**
    - **{inst_id} reference from institute{inst_id}**

File Edit View Search Terminal Help

cs_id	inst_id	toatal_seats	cutoff
CSE	101	40	250
ME	101	40	200
EE	101	40	170
ECE	101	40	180
CSE	102	40	240
ME	102	40	190
EE	102	40	168
ECE	102	40	178
CSE	103	40	235
ME	103	40	185
EE	103	40	165
ECE	103	40	175
CSE	104	40	232
ME	104	40	180
EE	104	40	162
ECE	104	40	172
CSE	105	40	228
ME	105	40	178
EE	105	40	160
ECE	105	40	170
CSE	106	60	225
ME	106	60	175
EE	106	60	160
CSE	107	60	225
ME	107	60	176
EE	107	60	158
CSE	108	40	222
ME	108	40	172
EE	108	40	155
ECE	108	40	165
CSE	109	40	220
ME	109	40	170

:

- **VERIFICATION CENTER**(incharge, center_id)
  - **PRIMARY KEY:**
    - **{center_id}**
  - **FOREIGN KEY:**
    - **{center_id} reference from institute {ins_id}**



FUNCTIONAL DEPENDENCIES

- **STUDENTS** (s_id, f_name, l_name,marks, state, city, gender)

  s_id ---> {f_name,l_name}

  s_id ----> marks

  s_id ----> state

  s_id ----> city

  s_id ----> gender

  Normal Form : BCNF

- **INSTITUTE** (inst_id, name, type,city,state)

  Inst_id ----> name

  Inst_id ----> type

  Inst_id ----> city

  Inst_id -----> state

  Normal Form : BCNF

- **COURSES** (c_code, c_name)

  c_code ----> c_name

  Normal Form : BCNF

- **REGISTERS** (stu_id, cour_id, ins_id, preference,reg_date)

  {stu_id , cour_id , ins_id} ----> preference

  {stu_id , cour_id , ins_id} ----> reg_date

  Normal Form : BCNF

- **CHOICE SET** (stud_id , c_id, insti_id)

  {stud_id , c_id , insti_id} ----> stud_id

  {stud_id , c_id , insti_id} ----> c_id

  {stud_id , c_id , insti_id} ----> insti_id

  Normal Form : BCNF

- **ADMITTED STUDENT**(stud_id,c_id ,ins_id , date)

  {stud_id,c_id,ins_id,date}----->{stud_id}

  {stud_id,c_id,ins_id,date}----->{c_id}

  {stud_id,c_id,ins_id,date}----->{ins_id}

  {stud_id,c_id,ins_id,date}----->{date}

  Normal Form : BCNF

- **OFFERS** (cs_id ,inst_id, total_seats,cut_off)

  {cs_id, inst_id} ----> total_seats

  {cs_id, inst_id} ----> cut_off

  Normal Form : BCNF

- **VERIFICATION CENTER**(incharge, center_id)

  Center_id ----> incharge

  Normal Form : BCNF

QUERIES

1. **List the name of the branch and their avg cutoff of the year.**

```sql
CREATE VIEW branch_wise_cutoff AS

SELECT
    c_code,c_name,avgCutoff
from COURSES
    join
        (
            select cs_id,avg(cutoff) as AvgCutoff
            from offers group by cs_id
        )
        AS R1
    on COURSES.c_code = R1.cs_id;

select * from branch_wise_cutoff;
```

```
File  Edit  View  Search  Terminal  Help
postgres=# CREATE VIEW branch_wise_cutoff AS
SELECT c_code, c_name, avgcutoff
              from courses
join
    (select cs_id, avg(cutoff) as AvgCutoff
           from offers group by cs_id)
    AS R1 on
courses.c_code = R1.cs_id;
CREATE VIEW
postgres=# SELECT * FROM branch_wise_cutoff;
 c_code |                  c_name                   |      avgcutoff
--------+-------------------------------------------+----------------------
 CSE    | COMPUTER SCIENCE ENGINEERING              | 209.6190476190476190
 IT     | INFORMATION TECHNOLOGY                    | 166.4285714285714286
 ECE    | ELECTRONICS AND COMMUNICATION ENGINEERING | 165.0000000000000000
 ME     | MECHANICAL ENGINEERING                    | 171.3750000000000000
 EE     | ELECTRICAL ENGINEERING                    | 156.1250000000000000
(5 rows)

postgres=#
```

2. Show the gender wise registration count.

```
select
        gender, count(s_id) as registration
    from STUDENTS
        group by gender;
```

```
postgres=# select
postgres-#  gender,count(s_id) as registration
postgres-#  from
postgres-#  STUDENTS group by gender;
 gender | registration
--------+--------------
 M      |           17
 F      |            9
(2 rows)

postgres=#
```

3. Name of the students who registers for less than 2 preference

```sql
SELECT
    s_id,
    f_name
from
    students as s
join
    (
    SELECT
        distinct stu_id
    from
        registers
    where
        preference='1'
    except
    SELECT
        distinct stu_id
    from
        registers
    where
        preference='2'
    ) as r1
on
s.s_id = r1.stu_id
;
```

```
postgres=# select s_id,f_name,l_name from students as s
postgres-# join
postgres-# (
postgres(# select distinct stu_id from registers where preference='1'
postgres(# except
postgres(# select distinct stu_id from registers where preference='2'
postgres(# ) as r1
postgres-# on
postgres-# s.s_id = r1.stu_id
postgres-# ;
      s_id       | f_name  | l_name
-----------------+---------+--------
 20195           | ANAND   | MISHRA
 20196           | BHAVANA | KURRA
(2 rows)
```

4. Select details of student who registers for colleges but didn’t get any seat.

```sql
SELECT
    *
from
    students as s
join
    (
        SELECT
            distinct stu_id
        from registers

        except

        SELECT
            distinct stud_id
        from choiceset
    ) as r1
on
    r1.stu_id = s.s_id;
```

```
postgres=#  select * from students as s
postgres-#  join
postgres-#  (select distinct stu_id from registers
postgres(#  except
postgres(#  select distinct stud_id from choiceset) as r1
postgres-#  on r1.stu_id = s.s_id;
      s_id       | f_name  | l_name  | marks |     state      |    city    | gender |     stu_id
-----------------+---------+---------+-------+----------------+------------+--------+-----------------
 20194           | ALOK    | PANCHAL |    97 | MADHYA PRADESH | JABALPUR   | M      | 20194
 20192           | SHUBHAM | SHARMA  |   100 | UTTAR PRADESH  | FARUKHABAD | M      | 20192
 20193           | ANUPMA  | GUPTA   |    80 | UTTAR PRADESH  | AGRA       | F      | 20193
(3 rows)

postgres=#
```

5. select the details of students who got their first preference college.

```
SELECT
        f_name,
        stud_id,
        cour_id,
        insti_id
from
        students as s
join
    (
        SELECT
                stud_id,
                cour_id,
                insti_id
        from
                registers
        join
                choiceset
        on
                stud_id = stu_id
            and
                c_id = cour_id
            and
                ins_id = insti_id
        where preference = 1
    ) as r1
on s.s_id = r1.stud_id;
```

```
postgres=#  select f_name,stud_id,cour_id,insti_id from students as s
postgres-#  join
postgres-#  (select stud_id,cour_id,insti_id from registers join choiceset
postgres(#  on
postgres(#  stud_id = stu_id and c_id = cour_id and ins_id = insti_id
postgres(#  where preference = 1) as r1
postgres-#  on s.s_id = r1.stud_id;
 f_name  |     stud_id     | cour_id | insti_id
---------+-----------------+---------+----------
 KESHAV  | 20188           | ME      | 104
 ANAND   | 20195           | ECE     | 109
 BHAVANA | 20196           | ECE     | 206
(3 rows)

postgres=#
postgres=#
```

6. List the details of verification centers which are feasible for students of particular state.(state = gujarat).

```sql
SELECT
        center_id,
        iname as c_name,
        incharge,
        city,
        state
from
        verification_center
join
        institute
on
        center_id = inst_id
where
        state ='GUJRAT';
```

```
postgres=#  select center_id,iname as c_name,incharge,city,state
postgres-#  from verification_center join institute
postgres-#  on center_id = inst_id
postgres-#  where state ='GUJRAT';
 center_id |     c_name      |  incharge   |    city     | state
-----------+-----------------+-------------+-------------+--------
 202       | SVNIT SURAT     | S.T.THAKKAR | SURAT       | GUJRAT
 110       | IIT GANDHINAGAR | R.L.SHAH    | GANDHINAGAR | GUJRAT
(2 rows)

postgres=#
postgres=#
```

7. Show the details of students whom college is alloted but does not take admission.

```
CREATE VIEW does_not_take_admission AS
SELECT
    s_id,f_name||' '||l_name as name,
    gender,
    city,
    state
from
    students as s
join
    (
    SELECT
        stud_id
    from
        choiceset
    except
    SELECT
        stud_id
    from
        admitted
    ) as r1
on
s.s_id = r1.stud_id;
SELECT * from does_not_take_admission;
```

```
postgres=# CREATE VIEW does_not_take_admission AS
postgres-# select s_id,f_name||' '||l_name as name,gender,city,state from
postgres-# students as s
postgres-# join
postgres-# (
postgres(# select stud_id from choiceset
postgres(# except
postgres(# select stud_id from admitted) as r1
postgres-# on s.s_id = r1.stud_id;
CREATE VIEW
postgres=# SELECT * from does_not_take_admission;
      s_id       |       name        | gender |   city    |    state
-----------------+-------------------+--------+-----------+-------------
 20190           | JOSHUA PODUKU     | M      | PUNE      | MAHARASHTRA
 20191           | VAIDEHI VAISHNAV  | F      | AHMEDABAD | GUJARAT
 20189           | PRAKHAR GUPTA     | M      | RAIPUR    | CHHATISGARH
(3 rows)

postgres=#
postgres=#
```

8. Show the details of students and institute who got admitted in the institute which is in their own state.

```sql
SELECT
        s_id,
        f_name||' '||l_name as name,
        gender,
        s.state
from
        students as s
join
    (
        SELECT
                stud_id,
                ins_id,
                iname,
                type,
                state
        from
                institute join admitted
        on
                inst_id = ins_id
    ) as i
 on s.s_id = i.stud_id
 where s.state = i.state;
```

```
postgres=# select s_id,f_name||' '||l_name as name,gender,s.state from students as s
postgres-# join
postgres-# (
postgres(#  select stud_id,ins_id,iname,type,state from institute join admitted
postgres(#  on
postgres(#  inst_id = ins_id
postgres(#  ) as i
postgres-#  on s.s_id = i.stud_id
postgres-#  where s.state = i.state;
      s_id       |     name      | gender |     state
-----------------+---------------+--------+---------------
 20195           | ANAND MISHRA  | M      | TELANGANA
 20196           | BHAVANA KURRA | F      | MADHYA PRADESH
(2 rows)

postgres=#
postgres=#
```

9. Numbers of seats left in each institute of each course after admission.

```
CREATE VIEW seat_left AS
SELECT
        inst_id,iname as institute, cs_id, seat_left
from
        institute
natural join
            (
                SELECT
                        inst_id, cs_id, toatal_seats - fs as seat_left

        from
            (
                SELECT inst_id, cs_id, toatal_seats, COALESCE(r1.count,0) as fs
        from
                offers
                left join
                (
                    SELECT
                            ins_id,c_id,count(stud_id)
                    from
                            admitted
                    group by (c_id,ins_id)
                ) as r1
                    on
                            inst_id=ins_id
                    and
                            c_id=cs_id
            ) as r2
            ) as r3
        order by inst_id;
select * from seat_left;
```

```
postgres=#  CREATE VIEW seat_left AS
postgres-#  select inst_id,iname as institute,cs_id,seat_left from institute natural join
postgres-#   (
postgres(#   select inst_id,cs_id,toatal_seats-fs as seat_left
postgres(# from
postgres(#   (select inst_id,cs_id,toatal_seats,COALESCE(r1.count,0) as fs
postgres(#    from
postgres(#   offers left join
postgres(#    (select ins_id,c_id,count(stud_id) from admitted group by (c_id,ins_id)) as r1
postgres(#   on inst_id=ins_id and c_id=cs_id) as r2) as r3
postgres-#   order by inst_id;
CREATE VIEW
postgres=#  select * from seat_left;
```

inst_id	institute	cs_id	seat_left
101	IIT BOMBAY	EE	40
101	IIT BOMBAY	ECE	40
101	IIT BOMBAY	CSE	40
101	IIT BOMBAY	ME	39
102	IIT DELHI	CSE	40
102	IIT DELHI	ECE	40
102	IIT DELHI	EE	39
102	IIT DELHI	ME	39
103	IIT KHARAGPUR	ECE	40
103	IIT KHARAGPUR	EE	40
103	IIT KHARAGPUR	CSE	40
103	IIT KHARAGPUR	ME	39
104	IIT KANPUR	ECE	40
104	IIT KANPUR	EE	40
104	IIT KANPUR	CSE	40
104	IIT KANPUR	ME	38
105	IIT BHU	ME	40
105	IIT BHU	ECE	40
105	IIT BHU	EE	40
105	IIT BHU	CSE	40
106	IIT PATNA	CSE	60
106	IIT PATNA	EE	60
106	IIT PATNA	ME	60
107	IIT ROORKEE	EE	60
107	IIT ROORKEE	ME	59
107	IIT ROORKEE	CSE	59
108	IIT ISM DHANBAD	ME	40
108	IIT ISM DHANBAD	EE	40
108	IIT ISM DHANBAD	ECE	40
108	IIT ISM DHANBAD	CSE	40
109	IIT HYDERABAD	ME	40
109	IIT HYDERABAD	EE	40

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109	IIT HYDERABAD	ME	40
109	IIT HYDERABAD	EE	40
109	IIT HYDERABAD	CSE	40
109	IIT HYDERABAD	ECE	38
110	IIT GANDHINAGAR	CSE	40
110	IIT GANDHINAGAR	ECE	40
110	IIT GANDHINAGAR	EE	40
110	IIT GANDHINAGAR	ME	40
201	NIT TRICHY	ECE	50
201	NIT TRICHY	EE	50
201	NIT TRICHY	CSE	50
201	NIT TRICHY	ME	49
202	SVNIT SURAT	ECE	40
202	SVNIT SURAT	EE	39
202	SVNIT SURAT	ME	40
202	SVNIT SURAT	IT	40
202	SVNIT SURAT	CSE	40
203	VNIT NAGPUR	EE	50
203	VNIT NAGPUR	ECE	50
203	VNIT NAGPUR	ME	50
203	VNIT NAGPUR	CSE	50
204	NIT WARANGAL	EE	49
204	NIT WARANGAL	ECE	50
204	NIT WARANGAL	ME	50
204	NIT WARANGAL	CSE	50
205	NIT ROURKELA	ME	40
205	NIT ROURKELA	IT	40
205	NIT ROURKELA	EE	40
205	NIT ROURKELA	ECE	40
205	NIT ROURKELA	CSE	40
206	MANIT BHOPAL	ME	50
206	MANIT BHOPAL	CSE	50
206	MANIT BHOPAL	ECE	49
206	MANIT BHOPAL	EE	50

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301	IIIT VADODARA	IT	78
301	IIIT VADODARA	CSE	78
302	IIIT GWALIOR	CSE	60
302	IIIT GWALIOR	IT	60
302	IIIT GWALIOR	ECE	60
303	IIIT PUNE	CSE	80
303	IIIT PUNE	IT	79
304	IIIT KANCHIPURAM	IT	80
304	IIIT KANCHIPURAM	CSE	79
305	IIIT ALLAHABAD	IT	60
305	IIIT ALLAHABAD	ECE	60
305	IIIT ALLAHABAD	CSE	60

(76 rows)

10. Show the institute name,type and coursewise cutoff where coursewise cutoff is maximum.

```
SELECT
      r4.inst_id,iname,r4.cs_id,max_cutoff
    from
      institute
    join
        (
          SELECT inst_id,r1.cs_id,max_cutoff
          from
        (
          SELECT cs_id,max(cutoff) as max_cutoff
          from offers group by cs_id) as r1
    join
        (
          SELECT cs_id,inst_id,cutoff from offers
        ) as r2
    on
    r1.cs_id = r2.cs_id
    where cutoff = max_cutoff
        ) as r4
    on
  institute.inst_id = r4.inst_id;
```

```
postgres=# select r4.inst_id,iname,r4.cs_id,max_cutoff from
postgres-#   institute
postgres-#   join
postgres-#   (
postgres(#   select inst_id,r1.cs_id,max_cutoff from
postgres(#   (select cs_id,max(cutoff) as max_cutoff from offers group by cs_id) as r1
postgres(#   join
postgres(#   (select cs_id,inst_id,cutoff from offers) as r2
postgres(#   on
postgres(#   r1.cs_id = r2.cs_id where cutoff = max_cutoff
postgres(#   ) as r4
postgres-#   on
postgres-#   institute.inst_id = r4.inst_id;
 inst_id |     iname      | cs_id | max_cutoff
---------+----------------+-------+------------
 101     | IIT BOMBAY     | CSE   |        250
 101     | IIT BOMBAY     | ME    |        200
 101     | IIT BOMBAY     | EE    |        170
 101     | IIT BOMBAY     | ECE   |        180
 205     | NIT ROURKELA   | IT    |        180
 305     | IIIT ALLAHABAD | IT    |        180
(6 rows)
```