```
Server [localhost]:
Database [postgres]:
Port [5432]:
Username [postgres]:
Password for user postgres:
psql (15.1)
postgres=# \l
                                       List of databases
  Name | Owner | Encoding | Collate | Ctype | ICU Locale |
Locale Provider | Access privileges
pgdata | postgres | UTF8 | C
                                       | C
libc
postgres | postgres | UTF8 | C | C
| C
                                       | C
| postgres=CTc/postgres
                            | C
                                      | C
template1 | postgres | UTF8
         | =c/postgres
| postgres=CTc/postgres
testingdb | postgres | UTF8 | C | C
libc
(5 rows)
postgres=# \c pgdata
You are now connected to database "pgdata" as user "postgres".
pgdata=# \d
      List of relations
 Schema | Name | Type | Owner
public | dept | table | postgres
public | emp | table | postgres
(2 rows)
pgdata=# select * from emp;
eid | ename | salary | did
 104 | Jaideep |
                   10 l
 101 | SARAV
                  40 l
                         1
 102 | SARAV
                  50 |
                         1
                 60 l
                         1
 103 | SARAV
                  30 |
                         2
 105 | Jaideep |
                 20 |
 106 | Jaideep |
                         2
            | 70.003 |
 107 | USAF
                         2
 108 | USAF
                        2
             | 0 |
 109 | USAF
                  120 |
                         3
 110 | TAKUR
                         3
                  110 l
```

111	TAKUR	100	4
112	TAKUR	j 90 j	4
113	JAIDEEP	j 80 j	4
(13 rd	ows)		

pgdata=# select * from dept;

d	id	dname	fnum
(5	1 2 3 4 5	Matchground Practice ground Meeting Area Management resturant	9 8 5 6
(5		resturant	3

pgdata=# select * from emp order by eid DESC;

eid	ename	salary	did
113	JAIDEEP	80	4
112	TAKUR	j 90	j 4
111	TAKUR	100	4
110	TAKUR	110	3
109	USAF	120	3
108	USAF	0	2
107	USAF	70.003	2
106	Jaideep	20	2
105	Jaideep	30	2
104	Jaideep	10	1
103	SARAV	60	1
102	SARAV	50	1
101	SARAV	40	1
(13 rows)			

pgdata=# select * from emp;

eid	ename	salary	did	
104	 Jaideep	 10	1	
101	SARAV	j 40	1	
102	SARAV	j 50	1	
103	SARAV	j 60	1	
105	Jaideep	30	2	
106	Jaideep	20	2	
107	USAF	70.003	2	
108	USAF	0	2	
109	USAF	120	3	
110	TAKUR	110	3	
111	TAKUR	100	4	
112	TAKUR	90	4	
113	JAIDEEP	80	4	
(13 rows)				

```
113 | JAIDEEP |
                      80 I
                              4
                      90
                              4
 112 | TAKUR
 111 | TAKUR
                     100
                              4
 110
       TAKUR
                     110
                              3
                              3
 109
       USAF
                     120
                              2
 108 | USAF
                       0
                              2
 107 | USAF
                  70.003
                              2
 106 |
       Jaideep
                      20
                              2
 105
       Jaideep
                      30
                              1
 104
                      10
       Jaideep
                              1
 103 I
       SARAV
                      60
 102 |
       SARAV
                      50
                              1
 101 | SARAV
                      40
                              1
(13 rows)
```

pgdata=# select * from dept order by did DESC;

pgdata=# select (eid,ename,salary) from emp inner join dept on emp.did=dept.did;

```
row
```

(104, Jaideep, 10)

(101, SARAV, 40)

(102, SARAV, 50)

(103, SARAV, 60)

(105, Jaideep, 30)

(106, Jaideep, 20)

(107, USAF, 70.003)

(108, USAF, 0)

(109, USAF, 120)

(110, TAKUR, 110)

(111, TAKUR, 100)

(112, TAKUR, 90)

(113, JAIDEEP, 80)

(13 rows)

pgdata=# select (eid,ename,salary) from emp inner join dept on emp.did=dept.did;

row

^{(104,} Jaideep, 10)

^{(101,} SARAV, 40)

^{(102,} SARAV, 50)

^{(103,} SARAV, 60)

^{(105,} Jaideep, 30)

^{(106,} Jaideep, 20)

```
(107, USAF, 70.003)
 (108, USAF, 0)
 (109, USAF, 120)
 (110, TAKUR, 110)
 (111, TAKUR, 100)
 (112, TAKUR, 90)
 (113, JAIDEEP, 80)
(13 rows)
pgdata=# SELECT (eid,ename,salary) from emp full outer join dept on
emp.did=dept.did;
         row
 (104, Jaideep, 10)
 (101, SARAV, 40)
 (102, SARAV, 50)
 (103, SARAV, 60)
 (105, Jaideep, 30)
 (106, Jaideep, 20)
 (107, USAF, 70.003)
 (108, USAF, 0)
 (109, USAF, 120)
 (110, TAKUR, 110)
 (111, TAKUR, 100)
 (112, TAKUR, 90)
 (113, JAIDEEP, 80)
 (,,)
(14 rows)
pgdata=# select (eid,ename,salary) from emp inner join dept on
emp.did=dept.did;
         row
 (104, Jaideep, 10)
 (101, SARAV, 40)
 (102, SARAV, 50)
 (103, SARAV, 60)
 (105, Jaideep, 30)
 (106, Jaideep, 20)
 (107, USAF, 70.003)
 (108, USAF, 0)
 (109, USAF, 120)
 (110, TAKUR, 110)
 (111, TAKUR, 100)
 (112, TAKUR, 90)
 (113, JAIDEEP, 80)
(13 rows)
pgdata=# SELECT (eid,ename,salary) from emp LEFT JOIN dept
emp.did=dept.did;
         row
 (104, Jaideep, 10)
 (101, SARAV, 40)
```

```
(103, SARAV, 60)
 (105, Jaideep, 30)
 (106, Jaideep, 20)
 (107, USAF, 70.003)
 (108, USAF, 0)
 (109, USAF, 120)
 (110, TAKUR, 110)
 (111, TAKUR, 100)
 (112, TAKUR, 90)
 (113, JAIDEEP, 80)
(13 rows)
pgdata=# SELECT (eid,ename,dname) from emp LEFT JOIN dept
emp.did=dept.did;
                 row
 (104, Jaideep, Matchground)
 (101, SARAV, Matchground)
 (102, SARAV, Matchground)
 (103, SARAV, Matchground)
 (105,Jaideep,"Practice ground")
(106,Jaideep,"Practice ground")
 (107,USAF,"Practice ground") (108,USAF,"Practice ground")
 (109, USAF, "Meeting Area")
 (110, TAKUR, "Meeting Area")
 (111, TAKUR, Management)
 (112, TAKUR, Management)
 (113, JAIDEEP, Management)
(13 rows)
pgdata=# select * from emp;
 eid | ename | salary | did
 104 | Jaideep
                        10
                                1
 101 | SARAV
                        40
                                1
 102 | SARAV
                        50
                                1
                                1
 103 | SARAV
                        60
 105 | Jaideep
                        30
                                2
                                2
 106 | Jaideep |
                        20
                 1 70.003
                                2
 107
       USAF
                                2
 108
       USAF
                         0
                                3
 109 | USAF
                       120
                       110
                                3
 110 | TAKUR
                                4
 111 |
                       100
       TAKUR
                        90
                                4
 112 | TAKUR
 113 | JAIDEEP
                        80
(13 rows)
pgdata=# select * from dept;
 did |
             dname
                          | fnum
   1 | Matchground
                                9
```

(102, SARAV, 50)

```
2 | Practice ground |
   3 | Meeting Area
                              5
   4 | Management
                              6
   5 | resturant
                              3
(5 rows)
pgdata=# insert into emp values(114, 'Rohith', 16);
INSERT 0 1
pgdata=# select * from emp;
 eid | ename | salary | did
 104 | Jaideep |
                      10 |
                              1
 101 | SARAV
                      40
                              1
 102 | SARAV
                      50
                              1
 103 |
                              1
       SARAV
                      60
                      30
 105 | Jaideep
                              2
                              2
 106 | Jaideep |
                      20
                              2
 107
     | USAF
                70.003
                              2
 108
       USAF
                       0
                              3
 109 | USAF
                     120
                              3
 110 | TAKUR
                     110
                              4
 111 | TAKUR
                     100
                              4
 112 | TAKUR
                      90
 113 | JAIDEEP
                      80
                              4
 114 | Rohith
                      16 |
(14 rows)
pqdata=# select * from dept;
 did |
            dname | fnum
   1 | Matchground
                              9
   2 | Practice ground |
                              8
                              5
   3 | Meeting Area
   4 | Management
                              6
   5 | resturant
                              3
(5 rows)
pgdata=# SELECT (ename, dname, salary) from emp LEFT JOIN dept ON
emp.did=dept.did;
                row
 (Jaideep, Matchground, 10)
 (SARAV, Matchground, 40)
 (SARAV, Matchground, 50)
 (SARAV, Matchground, 60)
 (Jaideep, "Practice ground", 30)
 (Jaideep, "Practice ground", 20)
 (USAF, "Practice ground", 70.003) (USAF, "Practice ground", 0)
```

(USAF, "Meeting Area", 120) (TAKUR, "Meeting Area", 110) (TAKUR, Management, 100) (TAKUR, Management, 90)

```
(JAIDEEP, Management, 80)
 (Rohith,,16)
(14 rows)
pgdata=# SELECT (ename,dname,salary) from emp RIGHT JOIN dept
emp.did=dept.did;
                row
 (Jaideep, Matchground, 10)
 (SARAV, Matchground, 40)
 (SARAV, Matchground, 50)
 (SARAV, Matchground, 60)
 (Jaideep,"Practice ground",30)
 (Jaideep, "Practice ground", 20)
 (USAF,"Practice ground",70.003)
 (USAF, "Practice ground", 0)
 (USAF, "Meeting Area", 120)
 (TAKUR, "Meeting Area", 110)
 (TAKUR, Management, 100)
 (TAKUR, Management, 90)
 (JAIDEEP, Management, 80)
 (,resturant,)
(14 rows)
pgdata=# SELECT * from emp e inner join dept d on e.did <> d.did;
               | salary | did | did |
                                                           | fnum
        ename
                                              dname
 105 |
       Jaideep
                      30
                              2 |
                                     1 | Matchground
                                                                9
                              2 İ
                                                                9
                      20
                                     1 |
 106
       Jaideep
                                         Matchground
                  70.003
                              2 İ
                                                                9
 107
       USAF
                                         Matchground
                              2
                                                                9
                                     1 |
 108
       USAF
                       0
                                         Matchground
                              3 |
                                                                9
 109
       USAF
                     120
                                     1 | Matchground
                                     1 |
                                                                9
                              3 |
 110
     | TAKUR
                     110
                                         Matchground
                                                                9
 111
       TAKUR
                     100
                              4 |
                                     1 |
                                         Matchground
 112
                              4
                                     1 | Matchground
                                                                9
       TAKUR
                      90
                              4 |
                                                                9
 113
                      80
                                     1 | Matchground
       JAIDEEP
                                     2 | Practice ground
                                                                8
 104
       Jaideep
                      10
                              1 |
 101
       SARAV
                      40
                              1 |
                                     2 | Practice ground
                                                                8
                                     2 | Practice ground
                      50
                              1
                                                                8
 102
       SARAV
 103
       SARAV
                      60
                              1 |
                                     2 | Practice ground
                                                                8
                                    2 | Practice ground
                              3 I
                                                                8
 109
       USAF
                     120 I
                              3 |
                                    2 | Practice ground
 110
       TAKUR
                     110
                                                                8
 111 |
                                    2 | Practice ground |
       TAKUR
                     100
                              4
                                                                8
```

4 |

4 |

1 |

1 |

1 |

2 j

2 |

2 |

2 |

4 |

3 I

3 |

3 |

3 |

3 |

3 I

1

90

80

10

40

50

60

30

20

0

100

70.003

112

104

101

102

103

105

107

108

106 |

113 |

TAKUR

SARAV

SARAV

SARAV

USAF

USAF

111 | TAKUR

Jaideep

Jaideep

JAIDEEP

Jaideep

2 | Practice ground

2 | Practice ground

Meeting Area

Meeting Area

Meeting Area

Meeting Area

Meeting Area

Meeting Area 3 | Meeting Area

3 | Meeting Area

3 | Meeting Area

8

8

5

5

5

5

5

5

5

5

5

112	TAKUR	90	4	3	Meeting Area	5
113	JAIDEEP	80	4	3	Meeting Area	5
104	Jaideep	10	1	4	Management	6
101	SARAV	40	1	4	Management	6
102	SARAV	50	1	4	Management	6
103	SARAV	60	1	4	Management	6
105	Jaideep	30	2	4	Management	6
106	Jaideep	20	2	4	Management	6
107	USAF	70.003	2	4	Management	6
108	USAF	0	2	4	Management	6
109	USAF	120	3	4	Management	6
110	TAKUR	110	3	4	Management	6
104	Jaideep	10	1	5	resturant	3
101	SARAV	40	1	5	resturant	3
102	SARAV	50	1	5	resturant	3
103	SARAV	60	1	5	resturant	j 3
105	Jaideep	30	2	5	resturant	3
106	Jaideep	20	2	5	resturant	j 3
107	USAF	70.003	2	5	resturant	j 3
108	USAF	0	2	5	resturant	j 3
109	USAF	120	3	5	resturant	3
110	TAKUR	110	3	5	resturant	3
111	TAKUR	100	4	5	resturant	j 3
112	TAKUR	90	4	5	resturant	3
113	JAIDEEP	80	4	5	resturant	j 3
(52 rc	ows)					

pgdata=# UPDATE emp set salary =salary * 0.50 WHERE eid IN (SELECT eid FROM emp where eid >= 110); UPDATE 5

pgdata=# select * from emp;

eid	ename	salary	did	
104	Jaideep	10	1	
101	SARAV	40	1	
102	SARAV	50	1	
103	SARAV	60	1	
105	Jaideep	30	2	
106	Jaideep	20	2	
107	USAF	70.003	2	
108	USAF	j 0	2	
109	USAF	120	3	
110	TAKUR	55	3	
111	TAKUR	50	4	
112	TAKUR	45	4	
113	JAIDEEP	40	4	
114	Rohith	8		
(14 rows)				

pgdata=# SELECT * from emp e where salary>(select AVG(salary) from emp where did=e.did);

eid | ename | salary | did

```
102 | SARAV |
                   50
 103 | SARAV |
                   60
                           1
 107 | USAF
               70.003
                           2
                           3
 109 | USAF
                  120 I
 111 | TAKUR |
                           4
                   50 I
(5 rows)
pgdata=# SELECT * from emp e where salary>(select AVG(salary) from
emp);
 eid | ename | salary | did
 102
       SARAV I
                   50 I
 103 |
       SARAV |
                   60
                           1
                           2
 107 | USAF
             | 70.003
 109 | USAF
                  120
                           3
                   55
                           3
 110 | TAKUR |
 111 | TAKUR |
                   50
                           4
                           4
 112 | TAKUR |
                   45 I
(7 rows)
pgdata=# select * from emp;
 eid | ename | salary | did
                             1
 104 | Jaideep |
                     10
 101 | SARAV
                     40
                             1
 102 | SARAV
                     50
                             1
 103
       SARAV
                     60
                             1
 105 |
       Jaideep |
                     30
                             2
                             2
                     20
 106 | Jaideep |
 107 | USAF
                70.003
                             2
                             2
 108 | USAF
                      0
                    120
 109 | USAF
                             3
                             3
 110 | TAKUR
                     55
 111 | TAKUR
                     50 I
 112
       TAKUR
                     45
                             4
 113 | JAIDEEP
                     40
                             4
 114 | Rohith
                      8 |
(14 rows)
pgdata=# select avg(salary) from emp;
        avg
 42.71449988228934
(1 row)
pgdata=# begin;
BEGIN
pgdata=*# delete from emp where eid=109;
DELETE 1
pgdata=*# select * from emp;
eid | ename | salary | did
```

```
1
104 | Jaideep |
                      10 l
101 | SARAV
                      40
                              1
                      50
102 | SARAV
                             1
103
       SARAV
                              1
                      60
                      30
                              2
105 | Jaideep
106 | Jaideep |
                      20
                70.003
                             2
107 | USAF
108
     | USAF
                      0
                             2
                      55
                             3
110 | TAKUR
                             4
111 | TAKUR
                      50 I
112
       TAKUR
                      45 l
                             4
113 | JAIDEEP
                      40
                             4
114 | Rohith
                       8 |
(13 rows)
```

pgdata=*# delete from emp where eid=108 OR eid=106 OR eid=111 OR eid=112 OR eid=113;
DELETE 5

```
pgdata=*# select * from emp;
eid | ename | salary | did
                             1
 104 | Jaideep |
                     10
 101 | SARAV
                     40
                            1
 102 | SARAV
                     50
 103
      SARAV
                     60
                            1
 105 | Jaideep
                     30
                            2
                            2
                 70.003
107 | USAF
 110 | TAKUR
                     55
                            3
114 | Rohith
                      8
(8 rows)
```

pgdata=*# UPDATE emp set eid=106 where ename='USAF';
UPDATE 1

pgdata=*# select * from emp; eid | ename | salary | did 104 | Jaideep 10 1 101 | SARAV 40 1 50 1 102 | SARAV 103 | SARAV 60 1 2 30 105 | Jaideep 110 | TAKUR 55 3 114 | Rohith 8 106 | USAF 2 | 70.003 | (8 rows)

pgdata=*# UPDATE emp set eid=108 where ename='TAKUR'; UPDATE 1 $^{\circ}$

pgdata=*# UPDATE emp set eid=109 where ename='Rohith';
UPDATE 1

```
pgdata=*# select * from emp;
eid | ename | salary | did
104 | Jaideep |
                 10 l
101 | SARAV |
                  40
                          1
                  50 I
102 | SARAV
103 | SARAV
                  60 |
                         1
105 | Jaideep |
                   30 |
                          2
106 | USAF | 70.003 |
                         2
              | 55 |
                          3
108 | TAKUR
109 | Rohith |
                   8 |
(8 rows)
pgdata=*# INSERT INTO emp values(107, 'Getlost', 26),
(110, 'Byebye', 29);
INSERT 0 2
pgdata=*# select * from emp;
eid | ename | salary | did
104 | Jaideep |
                 40 |
50 |
101 | SARAV
                         1
102 | SARAV
                          1
103 | SARAV |
                  60 | 1
105 | Jaideep | 30 |
106 | USAF | 70.003 |
                         2
108 | TAKUR
              | 55 |
                   8 |
109 | Rohith |
107 | Getlost |
                   26 |
110 | Byebye |
                  29 |
(10 rows)
pgdata=*# COMMIT;
COMMIT
pgdata=# select * from emp;
eid | ename | salary | did
```

```
104 | Jaideep | 10 |
                           1
                   40 I
101 | SARAV
102 | SARAV
                   50 l
                           1
103 | SARAV
                    60 |
                           1
                   30 |
                          2
108 | TAKUR | 70.003 | 100 | 5
105 | Jaideep |
                           2
                           3
                    8 |
109 | Rohith
107 | Getlost |
                   26 I
110 | Byebye |
                    29 |
(10 rows)
```

```
Seq Scan on emp (cost=0.00..1.14 rows=14 width=18)
(1 row)
pgdata=# create index empindex ON emp(eid);
CREATE INDEX
pgdata=# EXPLAIN SELECT * FROM emp;
              QUERY PLAN
Seq Scan on emp (cost=0.00..1.10 rows=10 width=18)
(1 row)
pgdata=# select * from emp;
 eid | ename | salary | did
 104 | Jaideep |
                    10 |
                  10 |
40 |
 101 | SARAV
                          1
 102 | SARAV
                   50 |
                          1
 103 | SARAV |
                   60 l
                          1
 105 | Jaideep |
                   30
                          2
 106 | USAF | 70.003 |
                          2
              | 55 |
 108 | TAKUR
 109 | Rohith |
                    8 |
 107 | Getlost |
                    26 |
 110 | Byebye |
                    29 I
(10 rows)
pgdata=# explain select * from emp where eid = 109;
                    QUERY PLAN
 Seq Scan on emp (cost=0.00..1.12 rows=1 width=18)
  Filter: (eid = 109)
(2 rows)
pgdata=# CREATE VIEW didsalary AS SELECT did, salary FROM emp WHERE
did<>emp.did:
CREATE VIEW
pgdata=# SELECT * FROM didsalary;
did | salary
(0 rows)
pgdata=# DROP VIEW didsalary;
DROP VIEW
pgdata=# CREATE VIEW didsalary AS SELECT did, salary FROM emp WHERE
salary>50;
CREATE VIEW
pgdata=# SELECT * FROM didsalary;
did | salary
  1 | 60
```

```
2 | 70.003
  3 | 55
(3 rows)
pgdata=# INSERT INTO emp values(111, 'ASHA', 130,4);
INSERT 0 1
pgdata=# SELECT * FROM didsalary;
did | salary
____+
 1 | 60
  2 | 70.003
  3 | 55
  4 |
       130
(4 rows)
pgdata=# \d
       List of relations
Schema | Name | Type | Owner
public | didsalary | view | postgres
(3 rows)
pgdata=# \db
    List of tablespaces
  Name | Owner | Location
pg_default | postgres |
pg_global | postgres |
(2 rows)
pgdata=# \dv
  List of relations
Schema | Name | Type | Owner
-----
public | didsalary | view | postgres
(1 row)
pgdata-# \dv
  List of relations
Schema | Name | Type | Owner
-----
public | didsalary | view | postgres
(1 row)
pgdata-# \d
       List of relations
Schema | Name | Type | Owner
```

```
(3 rows)
pgdata-# \db
      List of tablespaces
   Name | Owner | Location
pg_default | postgres |
pg_global | postgres |
(2 rows)
pgdata=# CREATE TABLE arrtab(snum INT NOT NULL, cmen TEXT,cnum
TEXT[]);
CREATE TABLE
pgdata=# INSERT INTO arrtab
values(1,'DATTTA',array['9100820659','9959070819']);
INSERT 0 1
pgdata=# SELECT * FROM arrtab;
snum | cmen | cnum
   1 | DATTTA | {9100820659,9959070819}
(1 row)
```