

```
D:\Java\jdk1.8.0_144\bin\java "-javaagent:D:\Program Files\JetBrains\IntelliJ IDEA 2017.2.4\lib\idea_rt.jar=7432:D:\Program Files\JetBrains\IntelliJ IDEA 2017.2.4\bin" -Dfile.encoding=UTF-8 -classpath D:\Java\jdk1.8.0_144\jre\lib\charsets.jar;D:\Java\jdk1.8.0_144\jre\lib\deploy.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\access-bridge-64.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\cldrdata.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\dnsns.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\jaccess.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\jfxrt.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\localedata.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\nashorn.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\sunec.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\sunjce_provider.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\sunmscapi.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\sunpkcs11.jar;D:\Java\jdk1.8.0_144\jre\lib\ext\zipfs.jar;D:\Java\jdk1.8.0_144\jre\lib\javaws.jar;D:\Java\jdk1.8.0_144\jre\lib\jce.jar;D:\Java\jdk1.8.0_144\jre\lib\jfr.jar;D:\Java\jdk1.8.0_144\jre\lib\jfxswt.jar;D:\Java\jdk1.8.0_144\jre\lib\jsse.jar;D:\Java\jdk1.8.0_144\jre\lib\management-agent.jar;D:\Java\jdk1.8.0_144\jre\lib\plugin.jar;D:\Java\jdk1.8.0_144\jre\lib\resources.jar;D:\Java\jdk1.8.0_144\jre\lib\rt.jar;D:\Github\608\608_p2\output\production\608_p2 sql608.Main
```

To execute file, please enter: file absolute_path_to_file

e.g. file D:\t1.txt

file D:\test.txt

```
CREATE TABLE course (sid INT, homework INT, project INT, exam INT, grade STR20)
```

```
INSERT INTO course (sid, homework, project, exam, grade) VALUES (1, 99, 100, 100, "A")
```

Number of blocks of course: 1

Number of twoTuples of course: 1

Execution time: 0.078seconds

Disk IO taken: 1

```
SELECT * FROM course
```

*

```
sid homework    project examgrade
```

```
1   99   100  100  A
```

1 rows of results

Execution time: 0.077seconds

Disk IO taken: 1

```
INSERT INTO course (sid, homework, project, exam, grade) VALUES (2, NULL, 100, 100, "E")
```

Number of blocks of course: 2

Number of twoTuples of course: 2

Execution time: 0.149seconds

Disk IO taken: 2

```
SELECT * FROM course
```

*

```
sid homework    project examgrade
```

```
1   99   100  100  A
```

```
2  NULL100  100  E
```

2 rows of results

Execution time: 0.151seconds

Disk IO taken: 2

```
INSERT INTO course (sid, grade, exam, project, homework) VALUES (3, "E", 100, 100, 100)
```

Number of blocks of course: 3

Number of twoTuples of course: 3

Execution time: 0.15seconds

Disk IO taken: 2

```
SELECT * FROM course
```

*

```
sid homework    project examgrade
```

```
1   99   100  100  A
```

```
2  NULL100  100  E
```

```
3  100  100  100  E
```

3 rows of results

Execution time: 0.225seconds

Disk IO taken: 3

```
INSERT INTO course (sid, homework, project, exam, grade) SELECT * FROM course
```

*

Execution time: 0.676seconds

Disk IO taken: 9

```

SELECT * FROM course
*
sid homework    project examgrade
1  99  100 100 A
2  NULL 100 100 E
3  100 100 100 E
1  99  100 100 A
2  NULL 100 100 E
3  100 100 100 E

```

```

-----
6 rows of results
Execution time: 0.45seconds
Disk IO taken: 6

```

```

-----
DELETE FROM course WHERE grade = "E"
Number of blocks of course: 6
Number of twoTuples of course: 2

```

```

-----
SELECT * FROM course
*
sid homework    project examgrade
1  99  100 100 A
1  99  100 100 A

```

```

-----
2 rows of results
Execution time: 0.449seconds
Disk IO taken: 6

```

```

-----
INSERT INTO course (sid, homework, project, exam, grade) VALUES (4, 99, 100, 100, "B")
Number of blocks of course: 7
Number of twoTuples of course: 3
Execution time: 0.15seconds
Disk IO taken: 2

```

```

-----
SELECT * FROM course
*
sid homework    project examgrade
1  99  100 100 A
1  99  100 100 A
4  99  100 100 B

```

```

-----
3 rows of results
Execution time: 0.524seconds
Disk IO taken: 7

```

```

-----
DELETE FROM course
Number of blocks of course: 7
Number of twoTuples of course: 0

```

```

-----
SELECT * FROM course
*
sid homework    project examgrade
-----
0 rows of results
Execution time: 0.525seconds
Disk IO taken: 7

```

```

-----
DROP TABLE course

```

```

-----
CREATE TABLE course (sid INT, homework INT, project INT, exam INT, grade STR20)

```

```

-----
INSERT INTO course (sid, homework, project, exam, grade) VALUES (1, 99, 100, 100, "A")
Number of blocks of course: 1
Number of twoTuples of course: 1
Execution time: 0.075seconds
Disk IO taken: 1

```

```

-----
INSERT INTO course (sid, homework, project, exam, grade) VALUES (3, 100, 100, 98, "C")
Number of blocks of course: 2
Number of twoTuples of course: 2
Execution time: 0.15seconds
Disk IO taken: 2

```

INSERT INTO course (sid, homework, project, exam, grade) VALUES (3, 100, 69, 64, "C")
Number of blocks of course: 3
Number of twoTuples of course: 3
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (15, 100, 50, 90, "E")
Number of blocks of course: 4
Number of twoTuples of course: 4
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (15, 100, 99, 100, "E")
Number of blocks of course: 5
Number of twoTuples of course: 5
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (17, 100, 100, 100, "A")
Number of blocks of course: 6
Number of twoTuples of course: 6
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (2, 100, 100, 99, "B")
Number of blocks of course: 7
Number of twoTuples of course: 7
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (4, 100, 100, 97, "D")
Number of blocks of course: 8
Number of twoTuples of course: 8
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (5, 100, 100, 66, "A")
Number of blocks of course: 9
Number of twoTuples of course: 9
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (6, 100, 100, 65, "B")
Number of blocks of course: 10
Number of twoTuples of course: 10
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (7, 100, 50, 73, "C")
Number of blocks of course: 11
Number of twoTuples of course: 11
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (8, 50, 50, 62, "C")
Number of blocks of course: 12
Number of twoTuples of course: 12
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (9, 50, 50, 61, "D")
Number of blocks of course: 13
Number of twoTuples of course: 13
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (10, 50, 70, 70, "C")

Number of blocks of course: 14
Number of twoTuples of course: 14
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (11, 50, 50, 59, "D")
Number of blocks of course: 15
Number of twoTuples of course: 15
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (12, 0, 70, 58, "C")
Number of blocks of course: 16
Number of twoTuples of course: 16
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (13, 0, 50, 77, "C")
Number of blocks of course: 17
Number of twoTuples of course: 17
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (14, 50, 50, 56, "D")
Number of blocks of course: 18
Number of twoTuples of course: 18
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 19
Number of twoTuples of course: 19
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 20
Number of twoTuples of course: 20
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 21
Number of twoTuples of course: 21
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 22
Number of twoTuples of course: 22
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 23
Number of twoTuples of course: 23
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 24
Number of twoTuples of course: 24
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 25
Number of twoTuples of course: 25

Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 26
Number of twoTuples of course: 26
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 27
Number of twoTuples of course: 27
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 28
Number of twoTuples of course: 28
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 29
Number of twoTuples of course: 29
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 30
Number of twoTuples of course: 30
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 31
Number of twoTuples of course: 31
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 32
Number of twoTuples of course: 32
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 33
Number of twoTuples of course: 33
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 34
Number of twoTuples of course: 34
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 35
Number of twoTuples of course: 35
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 36
Number of twoTuples of course: 36
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 37
Number of twoTuples of course: 37
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 38
Number of twoTuples of course: 38
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 39
Number of twoTuples of course: 39
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 40
Number of twoTuples of course: 40
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 41
Number of twoTuples of course: 41
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 42
Number of twoTuples of course: 42
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 43
Number of twoTuples of course: 43
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 44
Number of twoTuples of course: 44
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 45
Number of twoTuples of course: 45
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 46
Number of twoTuples of course: 46
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 47
Number of twoTuples of course: 47
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 48
Number of twoTuples of course: 48
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 49
Number of twoTuples of course: 49
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 50
Number of twoTuples of course: 50
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 51
Number of twoTuples of course: 51
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 52
Number of twoTuples of course: 52
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 53
Number of twoTuples of course: 53
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 54
Number of twoTuples of course: 54
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 55
Number of twoTuples of course: 55
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 56
Number of twoTuples of course: 56
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (16, 0, 0, 0, "E")
Number of blocks of course: 57
Number of twoTuples of course: 57
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course (sid, homework, project, exam, grade) VALUES (17, 100, 100, 100, "A")
Number of blocks of course: 58
Number of twoTuples of course: 58
Execution time: 0.151seconds
Disk IO taken: 2

SELECT * FROM course
*

[illegible]

Execution time: 4.338seconds

```
SELECT sid, grade FROM course
```

```
sid grade
```

3 C

15 E

17 A

4 D

6 B

7 C


```
-----
58 rows of results
Execution time: 4.339second
Disk IO taken: 58
```

1	A
3	C
3	C
15	E
15	E
17	A
2	B
4	D
5	A
6	B
7	C
8	C
9	D
10	C
11	D
12	C
13	C
14	D
16	E
16	E
16	E
16	E
16	E

```
58 rows of results
Execution time: 4.338seconds
Disk IO taken: 58
```

```
5 rows of results
Execution time: 21.9seconds
Disk IO taken: 292
```

```
19 rows of results
```



```
-----
SELECT * FROM course WHERE grade = "A"
*
sid homework    project examgrade
5   100 100 66   A
1   99  100 100  A
17  100 100 100  A
17  100 100 100  A
-----
4 rows of results
Execution time: 4.338seconds
Disk IO taken: 58
```

```
-----
SELECT * FROM course WHERE exam = 100 OR exam = 99
*
sid homework    project examgrade
2   100 100 99   B
1   99  100 100  A
15  100 99  100  E
17  100 100 100  A
17  100 100 100  A
-----
5 rows of results
Execution time: 4.338seconds
Disk IO taken: 58
```

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```
16 0 0 0 E
16 0 0 0 E
16 0 0 0 E
16 0 0 0 E
16 0 0 0 E
16 0 0 0 E
16 0 0 0 E
```

```
-----
39 rows of results
Execution time: 4.339seconds
Disk IO taken: 58
```

```
-----
SELECT * FROM course WHERE exam > 70
```

```
*
sid homework    project examgrade
7  100 50 73 C
13 0 50 77 C
15 100 50 90 E
4  100 100 97 D
3  100 100 98 C
2  100 100 99 B
1  99 100 100 A
15 100 99 100 E
17 100 100 100 A
17 100 100 100 A
```

```
-----
10 rows of results
Execution time: 4.339seconds
Disk IO taken: 58
```

```
-----
SELECT * FROM course WHERE exam = 100 OR homework = 100 AND project = 100
```

```
*
sid homework    project examgrade
6  100 100 65 B
5  100 100 66 A
4  100 100 97 D
3  100 100 98 C
2  100 100 99 B
1  99 100 100 A
15 100 99 100 E
17 100 100 100 A
17 100 100 100 A
```

```
-----
9 rows of results
Execution time: 4.338seconds
Disk IO taken: 58
```

```
-----
SELECT * FROM course WHERE [ exam = 100 OR homework = 100 ] AND project = 100
```

```
*
sid homework    project examgrade
6  100 100 65 B
5  100 100 66 A
4  100 100 97 D
3  100 100 98 C
2  100 100 99 B
1  99 100 100 A
17 100 100 100 A
17 100 100 100 A
```

```
-----
8 rows of results
Execution time: 4.338seconds
Disk IO taken: 58
```

```
-----
SELECT * FROM course WHERE exam + homework = 200
```

```
*
sid homework    project examgrade
15 100 99 100 E
17 100 100 100 A
17 100 100 100 A
```

```
-----
3 rows of results
Execution time: 4.339seconds
Disk IO taken: 58
```

```
SELECT * FROM course WHERE ( exam * 30 + homework * 20 + project * 50 ) / 100 = 100
```

```
*
sid homework    project examgrade
17 100 100 100 A
17 100 100 100 A
```

```
-----
2 rows of results
```

```
Execution time: 4.338seconds
```

```
Disk IO taken: 58
```

```
-----
SELECT * FROM course WHERE grade = "C" AND [ exam > 70 OR project > 70 ] AND NOT ( exam * 30 + homework * 20 + project * 50 ) / 100 < 60
```

```
*
sid homework    project examgrade
Exception: Debug Required
```

```
-----
CREATE TABLE course2 (sid INT, exam INT, grade STR20)
```

```
-----
INSERT INTO course2 (sid, exam, grade) VALUES (1, 100, "A")
```

```
Number of blocks of course2: 1
```

```
Number of twoTuples of course2: 1
```

```
Execution time: 0.075seconds
```

```
Disk IO taken: 1
```

```
-----
INSERT INTO course2 (sid, exam, grade) VALUES (16, 25, "E")
```

```
Number of blocks of course2: 1
```

```
Number of twoTuples of course2: 2
```

```
Execution time: 0.152seconds
```

```
Disk IO taken: 2
```

```
-----
INSERT INTO course2 (sid, exam, grade) VALUES (17, 0, "A")
```

```
Number of blocks of course2: 2
```

```
Number of twoTuples of course2: 3
```

```
Execution time: 0.15seconds
```

```
Disk IO taken: 2
```

```
-----
SELECT * FROM course, course2
```

```
*
course course2
```

```
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
1  100 A  16 0  0  0  0  E
16 25  E  16 0  0  0  0  E
17 0   A  16 0  0  0  0  E
```

[illegible]

1	100	A	16	0	0	0	E
16	25	E	16	0	0	0	E
17	0	A	16	0	0	0	E
1	100	A	14	50	50	56	D
16	25	E	14	50	50	56	D
17	0	A	14	50	50	56	D
1	100	A	12	0	70	58	C
16	25	E	12	0	70	58	C
17	0	A	12	0	70	58	C
1	100	A	11	50	50	59	D
16	25	E	11	50	50	59	D
17	0	A	11	50	50	59	D
1	100	A	9	50	50	61	D
16	25	E	9	50	50	61	D
17	0	A	9	50	50	61	D
1	100	A	8	50	50	62	C
16	25	E	8	50	50	62	C
17	0	A	8	50	50	62	C
1	100	A	3	100	69	64	C
16	25	E	3	100	69	64	C
17	0	A	3	100	69	64	C
1	100	A	6	100	100	65	B
16	25	E	6	100	100	65	B
17	0	A	6	100	100	65	B
1	100	A	5	100	100	66	A
16	25	E	5	100	100	66	A
17	0	A	5	100	100	66	A
1	100	A	10	50	70	70	C
16	25	E	10	50	70	70	C
17	0	A	10	50	70	70	C
1	100	A	7	100	50	73	C
16	25	E	7	100	50	73	C
17	0	A	7	100	50	73	C
1	100	A	13	0	50	77	C
16	25	E	13	0	50	77	C
17	0	A	13	0	50	77	C
1	100	A	15	100	50	90	E
16	25	E	15	100	50	90	E
17	0	A	15	100	50	90	E
1	100	A	4	100	100	97	D
16	25	E	4	100	100	97	D
17	0	A	4	100	100	97	D
1	100	A	3	100	100	98	C
16	25	E	3	100	100	98	C
17	0	A	3	100	100	98	C
1	100	A	2	100	100	99	B
16	25	E	2	100	100	99	B
17	0	A	2	100	100	99	B
1	100	A	1	99	100	100	A
16	25	E	1	99	100	100	A
17	0	A	1	99	100	100	A
1	100	A	15	100	99	100	E
16	25	E	15	100	99	100	E
17	0	A	15	100	99	100	E
1	100	A	17	100	100	100	A
16	25	E	17	100	100	100	A
17	0	A	17	100	100	100	A
1	100	A	17	100	100	100	A
16	25	E	17	100	100	100	A
17	0	A	17	100	100	100	A

174 rows of results

Execution time: 43.452seconds

Disk IO taken: 581

INSERT INTO course2 (sid, exam, grade) VALUES (2, 99, "B")

Number of blocks of course2: 2

Number of twoTuples of course2: 4

Execution time: 0.149seconds

Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (3, 98, "C")

Number of blocks of course2: 3

Number of twoTuples of course2: 5

Execution time: 0.15seconds

Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (4, 97, "D")
Number of blocks of course2: 3
Number of twoTuples of course2: 6
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (5, 66, "A")
Number of blocks of course2: 4
Number of twoTuples of course2: 7
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (6, 65, "B")
Number of blocks of course2: 4
Number of twoTuples of course2: 8
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 5
Number of twoTuples of course2: 9
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 5
Number of twoTuples of course2: 10
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 6
Number of twoTuples of course2: 11
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 6
Number of twoTuples of course2: 12
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 7
Number of twoTuples of course2: 13
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 7
Number of twoTuples of course2: 14
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 8
Number of twoTuples of course2: 15
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 8
Number of twoTuples of course2: 16
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")

Number of blocks of course2: 9
Number of twoTuples of course2: 17
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 9
Number of twoTuples of course2: 18
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 10
Number of twoTuples of course2: 19
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 10
Number of twoTuples of course2: 20
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 11
Number of twoTuples of course2: 21
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 11
Number of twoTuples of course2: 22
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 12
Number of twoTuples of course2: 23
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO course2 (sid, exam, grade) VALUES (18, 0, "A")
Number of blocks of course2: 12
Number of twoTuples of course2: 24
Execution time: 0.149seconds
Disk IO taken: 2

SELECT course.sid, course.grade, course2.grade FROM course, course2 WHERE course.sid = course2.sid
course.sid course.grade course2.grade
course course2

1	A	A
2	B	B
3	C	C
3	C	C
4	D	D
5	A	A
6	B	B
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E
16	E	E

```
48 rows of results
Execution time: 37.105seconds
Disk IO taken: 496
```

```
SELECT DISTINCT course.grade, course2.grade FROM course, course2 WHERE course.sid = course2.sid
course.grade course2.grade
course course2
```

A	A
B	B
C	C
D	D
E	E

```
5 rows of results
Execution time: 51.688seconds
Disk IO taken: 690
```

```
SELECT * FROM course, course2 WHERE course.sid = course2.sid ORDER BY course.exam
*
course course2
```

[illegible]

```

16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
16 0 0 0 E 16 25 E
3 100 69 64 C 3 98 C
6 100 100 65 B 6 65 B
5 100 100 66 A 5 66 A
4 100 100 97 D 4 97 D
3 100 100 98 C 3 98 C
2 100 100 99 B 2 99 B
1 99 100 100 A 1 100 A
17 100 100 100 A 17 0 A
17 100 100 100 A 17 0 A

```

```

-----
48 rows of results
Execution time: 51.648seconds
Disk IO taken: 690

```

```

-----
SELECT * FROM course, course2 WHERE course.sid = course2.sid AND course.exam = 100 AND course2.exam = 100
*
course course2

```

```

1 99 100 100 A 1 100 A

```

```

-----
1 rows of results
Execution time: 8.089seconds
Disk IO taken: 117

```

```

-----
SELECT * FROM course, course2 WHERE course.sid = course2.sid AND [ course.exam = 100 OR course2.exam = 100 ]
*
course course2

```

```

1 99 100 100 A 1 100 A
17 100 100 100 A 17 0 A
17 100 100 100 A 17 0 A

```

```

-----
3 rows of results
Execution time: 37.177seconds
Disk IO taken: 496

```

```

-----
SELECT * FROM course, course2 WHERE course.sid = course2.sid AND course.exam > course2.exam
*
course course2

```

```

17 100 100 100 A 17 0 A
17 100 100 100 A 17 0 A

```

```

-----
2 rows of results
Execution time: 37.103seconds
Disk IO taken: 496

```

```

-----
SELECT * FROM course, course2 WHERE course.sid = course2.sid AND course.exam > course2.exam AND course.homework = 100
*
course course2

```

```

17 100 100 100 A 17 0 A
17 100 100 100 A 17 0 A

```

```

-----
2 rows of results
Execution time: 16.427seconds
Disk IO taken: 227

```

```

-----
SELECT * FROM course, course2 WHERE course.sid = course2.sid AND [ course.exam > course2.exam OR course.homework = 100 ]

```

```

*
course course2

2  100 100 99  B  2  99  B
3  100 69  64  C  3  98  C
3  100 100 98  C  3  98  C
4  100 100 97  D  4  97  D
5  100 100 66  A  5  66  A
6  100 100 65  B  6  65  B
17 100 100 100 A  17 0   A
17 100 100 100 A  17 0   A

```

```

-----
8 rows of results
Execution time: 37.1seconds
Disk IO taken: 496

```

```

-----
SELECT DISTINCT course.grade, course2.grade FROM course, course2 WHERE course.sid = course2.sid AND [ course.exam
> course2.exam OR course.grade = "A" AND course2.grade = "A" ] ORDER BY course.exam
course.grade course2.grade
course course2

```

```

A   A

```

```

-----
1 rows of results
Execution time: 51.94seconds
Disk IO taken: 690

```

```

-----
DROP TABLE course

```

```

-----
DROP TABLE course2

```

```

-----
CREATE TABLE r (a INT, b INT)

```

```

-----
CREATE TABLE s (b INT, c INT)

```

```

-----
CREATE TABLE t (a INT, c INT)

```

```

-----
INSERT INTO r (a, b) VALUES (0, 0)

```

```

Number of blocks of r: 1
Number of twoTuples of r: 1
Execution time: 0.075seconds
Disk IO taken: 1

```

```

-----
INSERT INTO r (a, b) VALUES (1, 1)

```

```

Number of blocks of r: 1
Number of twoTuples of r: 2
Execution time: 0.152seconds
Disk IO taken: 2

```

```

-----
INSERT INTO r (a, b) VALUES (1, 1)

```

```

Number of blocks of r: 1
Number of twoTuples of r: 3
Execution time: 0.149seconds
Disk IO taken: 2

```

```

-----
INSERT INTO r (a, b) VALUES (2, 2)

```

```

Number of blocks of r: 1
Number of twoTuples of r: 4
Execution time: 0.15seconds
Disk IO taken: 2

```

```

-----
INSERT INTO r (a, b) VALUES (3, 3)

```

```

Number of blocks of r: 2
Number of twoTuples of r: 5
Execution time: 0.151seconds
Disk IO taken: 2

```

```

-----
INSERT INTO r (a, b) VALUES (0, 0)

```

```

Number of blocks of r: 2
Number of twoTuples of r: 6
Execution time: 0.151seconds
Disk IO taken: 2

```

INSERT INTO r (a, b) VALUES (1, 1)
Number of blocks of r: 2
Number of twoTuples of r: 7
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (2, 2)
Number of blocks of r: 2
Number of twoTuples of r: 8
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 3
Number of twoTuples of r: 9
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 3
Number of twoTuples of r: 10
Execution time: 0.183seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 3
Number of twoTuples of r: 11
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 3
Number of twoTuples of r: 12
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 4
Number of twoTuples of r: 13
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 4
Number of twoTuples of r: 14
Execution time: 0.152seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 4
Number of twoTuples of r: 15
Execution time: 0.158seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 4
Number of twoTuples of r: 16
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 5
Number of twoTuples of r: 17
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 5
Number of twoTuples of r: 18
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 5
Number of twoTuples of r: 19
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 5
Number of twoTuples of r: 20
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 6
Number of twoTuples of r: 21
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 6
Number of twoTuples of r: 22
Execution time: 0.155seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 6
Number of twoTuples of r: 23
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 6
Number of twoTuples of r: 24
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 7
Number of twoTuples of r: 25
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 7
Number of twoTuples of r: 26
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 7
Number of twoTuples of r: 27
Execution time: 0.172seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 7
Number of twoTuples of r: 28
Execution time: 0.152seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 8

Number of twoTuples of r: 29
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 8
Number of twoTuples of r: 30
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 8
Number of twoTuples of r: 31
Execution time: 0.188seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 8
Number of twoTuples of r: 32
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 9
Number of twoTuples of r: 33
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 9
Number of twoTuples of r: 34
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 9
Number of twoTuples of r: 35
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 9
Number of twoTuples of r: 36
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 10
Number of twoTuples of r: 37
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 10
Number of twoTuples of r: 38
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 10
Number of twoTuples of r: 39
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 10
Number of twoTuples of r: 40
Execution time: 0.149seconds

Disk IO taken: 2

INSERT INTO r (a, b) VALUES (100, 100)
Number of blocks of r: 11
Number of twoTuples of r: 41
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (0, 0)
Number of blocks of s: 1
Number of twoTuples of s: 1
Execution time: 0.075seconds
Disk IO taken: 1

INSERT INTO s (b, c) VALUES (2, 2)
Number of blocks of s: 1
Number of twoTuples of s: 2
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (3, 3)
Number of blocks of s: 1
Number of twoTuples of s: 3
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (0, 0)
Number of blocks of s: 1
Number of twoTuples of s: 4
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (0, 0)
Number of blocks of s: 2
Number of twoTuples of s: 5
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (1, 1)
Number of blocks of s: 2
Number of twoTuples of s: 6
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (1, 1)
Number of blocks of s: 2
Number of twoTuples of s: 7
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (2, 2)
Number of blocks of s: 2
Number of twoTuples of s: 8
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (2, 2)
Number of blocks of s: 3
Number of twoTuples of s: 9
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (3, 3)
Number of blocks of s: 3
Number of twoTuples of s: 10
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (3, 3)
Number of blocks of s: 3
Number of twoTuples of s: 11
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (3, 3)
Number of blocks of s: 3
Number of twoTuples of s: 12
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 4
Number of twoTuples of s: 13
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 4
Number of twoTuples of s: 14
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 4
Number of twoTuples of s: 15
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 4
Number of twoTuples of s: 16
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 5
Number of twoTuples of s: 17
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 5
Number of twoTuples of s: 18
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 5
Number of twoTuples of s: 19
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 5
Number of twoTuples of s: 20
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 6
Number of twoTuples of s: 21
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)

Number of blocks of s: 6
Number of twoTuples of s: 22
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 6
Number of twoTuples of s: 23
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 6
Number of twoTuples of s: 24
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 7
Number of twoTuples of s: 25
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 7
Number of twoTuples of s: 26
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 7
Number of twoTuples of s: 27
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 7
Number of twoTuples of s: 28
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 8
Number of twoTuples of s: 29
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 8
Number of twoTuples of s: 30
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 8
Number of twoTuples of s: 31
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 8
Number of twoTuples of s: 32
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 9
Number of twoTuples of s: 33

Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 9
Number of twoTuples of s: 34
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 9
Number of twoTuples of s: 35
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 9
Number of twoTuples of s: 36
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 10
Number of twoTuples of s: 37
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 10
Number of twoTuples of s: 38
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 10
Number of twoTuples of s: 39
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 10
Number of twoTuples of s: 40
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO s (b, c) VALUES (101, 101)
Number of blocks of s: 11
Number of twoTuples of s: 41
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (0, 0)
Number of blocks of t: 1
Number of twoTuples of t: 1
Execution time: 0.074seconds
Disk IO taken: 1

INSERT INTO t (a, c) VALUES (1, 1)
Number of blocks of t: 1
Number of twoTuples of t: 2
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (2, 2)
Number of blocks of t: 1
Number of twoTuples of t: 3
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (0, 0)
Number of blocks of t: 1
Number of twoTuples of t: 4
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (1, 1)
Number of blocks of t: 2
Number of twoTuples of t: 5
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (1, 1)
Number of blocks of t: 2
Number of twoTuples of t: 6
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (2, 2)
Number of blocks of t: 2
Number of twoTuples of t: 7
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (3, 3)
Number of blocks of t: 2
Number of twoTuples of t: 8
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 3
Number of twoTuples of t: 9
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 3
Number of twoTuples of t: 10
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 3
Number of twoTuples of t: 11
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 3
Number of twoTuples of t: 12
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 4
Number of twoTuples of t: 13
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 4
Number of twoTuples of t: 14
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 4
Number of twoTuples of t: 15
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 4
Number of twoTuples of t: 16
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 5
Number of twoTuples of t: 17
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 5
Number of twoTuples of t: 18
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 5
Number of twoTuples of t: 19
Execution time: 0.173seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 5
Number of twoTuples of t: 20
Execution time: 0.151seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 6
Number of twoTuples of t: 21
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 6
Number of twoTuples of t: 22
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 6
Number of twoTuples of t: 23
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 6
Number of twoTuples of t: 24
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 7
Number of twoTuples of t: 25
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 7

Number of twoTuples of t: 26
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 7
Number of twoTuples of t: 27
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 7
Number of twoTuples of t: 28
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 8
Number of twoTuples of t: 29
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 8
Number of twoTuples of t: 30
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 8
Number of twoTuples of t: 31
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 8
Number of twoTuples of t: 32
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 9
Number of twoTuples of t: 33
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 9
Number of twoTuples of t: 34
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 9
Number of twoTuples of t: 35
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 9
Number of twoTuples of t: 36
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 10
Number of twoTuples of t: 37
Execution time: 0.15seconds

```
-----
INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 10
Number of twoTuples of t: 38
Execution time: 0.15seconds
Disk I/O taken: 2
```

```
INSERT INTO t (a, c) VALUES (102, 102)
Number of blocks of t: 10
Number of twoTuples of t: 40
Execution time: 0.15seconds
Disk IO taken: 2
```

```
SELECT * FROM r, s, t WHERE r.a=t.a AND r.b=s.b AND s.c=t.c
```

[illegible]


```
3 3 3 3 3 3
3 3 3 3 3 3
```

```
-----
46 rows of results
Execution time: 29.478seconds
Disk IO taken: 392
```

```
-----
DROP TABLE r
```

```
-----
DROP TABLE s
```

```
-----
DROP TABLE t
```

```
-----
CREATE TABLE t1 (c INT)
```

```
-----
CREATE TABLE t2 (c INT)
```

```
-----
CREATE TABLE t3 (c INT)
```

```
-----
CREATE TABLE t4 (c INT)
```

```
-----
CREATE TABLE t5 (c INT)
```

```
-----
CREATE TABLE t6 (c INT)
```

```
-----
INSERT INTO t1 (c) VALUES (0)
Number of blocks of t1: 1
Number of twoTuples of t1: 1
Execution time: 0.075seconds
Disk IO taken: 1
```

```
-----
INSERT INTO t1 (c) VALUES (1)
Number of blocks of t1: 1
Number of twoTuples of t1: 2
Execution time: 0.15seconds
Disk IO taken: 2
```

```
-----
INSERT INTO t1 (c) VALUES (2)
Number of blocks of t1: 1
Number of twoTuples of t1: 3
Execution time: 0.149seconds
Disk IO taken: 2
```

```
-----
INSERT INTO t1 (c) VALUES (3)
Number of blocks of t1: 1
Number of twoTuples of t1: 4
Execution time: 0.15seconds
Disk IO taken: 2
```

```
-----
INSERT INTO t1 (c) VALUES (4)
Number of blocks of t1: 1
Number of twoTuples of t1: 5
Execution time: 0.149seconds
Disk IO taken: 2
```

```
-----
INSERT INTO t2 (c) VALUES (0)
Number of blocks of t2: 1
Number of twoTuples of t2: 1
Execution time: 0.075seconds
Disk IO taken: 1
```

```
-----
INSERT INTO t2 (c) VALUES (1)
Number of blocks of t2: 1
Number of twoTuples of t2: 2
Execution time: 0.15seconds
Disk IO taken: 2
```

```
-----
INSERT INTO t2 (c) VALUES (2)
Number of blocks of t2: 1
Number of twoTuples of t2: 3
Execution time: 0.149seconds
```

Disk IO taken: 2

INSERT INTO t2 (c) VALUES (3)
Number of blocks of t2: 1
Number of twoTuples of t2: 4
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t3 (c) VALUES (0)
Number of blocks of t3: 1
Number of twoTuples of t3: 1
Execution time: 0.075seconds
Disk IO taken: 1

INSERT INTO t3 (c) VALUES (1)
Number of blocks of t3: 1
Number of twoTuples of t3: 2
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t3 (c) VALUES (2)
Number of blocks of t3: 1
Number of twoTuples of t3: 3
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t3 (c) VALUES (3)
Number of blocks of t3: 1
Number of twoTuples of t3: 4
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t4 (c) VALUES (0)
Number of blocks of t4: 1
Number of twoTuples of t4: 1
Execution time: 0.074seconds
Disk IO taken: 1

INSERT INTO t4 (c) VALUES (1)
Number of blocks of t4: 1
Number of twoTuples of t4: 2
Execution time: 0.15seconds
Disk IO taken: 2

INSERT INTO t5 (c) VALUES (0)
Number of blocks of t5: 1
Number of twoTuples of t5: 1
Execution time: 0.075seconds
Disk IO taken: 1

INSERT INTO t5 (c) VALUES (0)
Number of blocks of t5: 1
Number of twoTuples of t5: 2
Execution time: 0.149seconds
Disk IO taken: 2

INSERT INTO t6 (c) VALUES (0)
Number of blocks of t6: 1
Number of twoTuples of t6: 1
Execution time: 0.075seconds
Disk IO taken: 1

SELECT * FROM t1, t2, t3, t4, t5, t6

*

t1 t2 t3 t4 t5 t6

0 0 0 0 0 0
0 0 0 0 0 0

0	0	0	1	0	0
0	0	0	1	0	0
0	0	1	0	0	0
0	0	1	0	0	0
0	0	1	1	0	0
0	0	1	1	0	0
0	0	2	0	0	0
0	0	2	0	0	0
0	0	2	1	0	0
0	0	2	1	0	0
0	0	3	0	0	0
0	0	3	0	0	0
0	0	3	1	0	0
0	0	3	1	0	0
0	1	0	0	0	0
0	1	0	0	0	0
0	1	0	1	0	0
0	1	0	1	0	0
0	1	1	0	0	0
0	1	1	0	0	0
0	1	1	1	0	0
0	1	1	1	0	0
0	1	2	0	0	0
0	1	2	0	0	0
0	1	2	1	0	0
0	1	2	1	0	0
0	1	3	0	0	0
0	1	3	0	0	0
0	1	3	1	0	0
0	1	3	1	0	0
0	2	0	0	0	0
0	2	0	0	0	0
0	2	0	1	0	0
0	2	0	1	0	0
0	2	1	0	0	0
0	2	1	1	0	0
0	2	1	1	0	0
0	2	2	0	0	0
0	2	2	0	0	0
0	2	2	1	0	0
0	2	2	1	0	0
0	2	3	0	0	0
0	2	3	0	0	0
0	2	3	1	0	0
0	2	3	1	0	0
0	3	0	0	0	0
0	3	0	0	0	0
0	3	0	1	0	0
0	3	0	1	0	0
0	3	1	0	0	0
0	3	1	0	0	0
0	3	1	1	0	0
0	3	1	1	0	0
0	3	2	0	0	0
0	3	2	0	0	0
0	3	2	1	0	0
0	3	2	1	0	0
0	3	3	0	0	0
0	3	3	0	0	0
0	3	3	1	0	0
0	3	3	1	0	0
1	0	0	0	0	0
1	0	0	0	0	0
1	0	0	1	0	0
1	0	0	1	0	0
1	0	1	0	0	0
1	0	1	0	0	0
1	0	1	1	0	0
1	0	1	1	0	0
1	0	2	0	0	0
1	0	2	0	0	0
1	0	2	1	0	0
1	0	2	1	0	0
1	0	3	0	0	0
1	0	3	0	0	0
1	0	3	1	0	0
1	0	3	1	0	0
1	1	0	0	0	0

1	1	0	0	0	0
1	1	0	1	0	0
1	1	0	1	0	0
1	1	1	0	0	0
1	1	1	0	0	0
1	1	1	1	0	0
1	1	1	1	0	0
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1	2	3	1	0	0
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1	3	0	1	0	0
1	3	0	1	0	0
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1	3	1	0	0	0
1	3	1	1	0	0
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1	3	2	0	0	0
1	3	2	0	0	0
1	3	2	1	0	0
1	3	2	1	0	0
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1	3	3	1	0	0
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2	0	1	0	0	0
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2	0	1	1	0	0
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2	1	2	1	0	0
2	1	2	1	0	0
2	1	3	0	0	0
2	1	3	0	0	0
2	1	3	1	0	0
2	1	3	1	0	0

2	2	0	0	0	0
2	2	0	0	0	0
2	2	0	1	0	0
2	2	0	1	0	0
2	2	1	0	0	0
2	2	1	0	0	0
2	2	1	1	0	0
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3	2	2	0	0	0
3	2	2	1	0	0
3	2	2	1	0	0
3	2	3	0	0	0
3	2	3	0	0	0
3	2	3	1	0	0

3	2	3	1	0	0
3	3	0	0	0	0
3	3	0	0	0	0
3	3	0	1	0	0
3	3	0	1	0	0
3	3	1	0	0	0
3	3	1	0	0	0
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3	3	3	1	0	0
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4	0	0	0	0	0
4	0	0	1	0	0
4	0	0	1	0	0
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4	0	1	1	0	0
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4	0	2	1	0	0
4	0	2	1	0	0
4	0	3	0	0	0
4	0	3	0	0	0
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4	1	3	0	0	0
4	1	3	0	0	0
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4	1	3	1	0	0
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4	2	2	1	0	0
4	2	2	1	0	0
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4	2	3	1	0	0
4	3	0	0	0	0
4	3	0	0	0	0
4	3	0	1	0	0
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4	3	1	0	0	0
4	3	1	0	0	0
4	3	1	1	0	0
4	3	1	1	0	0
4	3	2	0	0	0
4	3	2	0	0	0
4	3	2	1	0	0
4	3	2	1	0	0
4	3	3	0	0	0
4	3	3	0	0	0

```
4 3 3 1 0 0
4 3 3 1 0 0
```

```
-----
320 rows of results
Execution time: 72.339seconds
Disk IO taken: 965
```

```
-----
DROP TABLE t1
```

```
-----
DROP TABLE t2
```

```
-----
DROP TABLE t3
```

```
-----
DROP TABLE t4
```

```
-----
DROP TABLE t5
```

```
-----
DROP TABLE t6
-----
```