```
sqlite> CREATE TABLE IF NOT EXISTS STudent (
   ...>     sid INTEGER PRIMARY KEY,
   ...>     name TEXT,
   ...>     birthdate TEXT,
   ...>     gender TEXT CHECK(gender IN ('Male', 'Female', 'Other'))
   ...> );
sqlite> INSERT INTO STudent (name, birthdate, gender) VALUES
   ...>     ('Student1', '1990-01-01', 'Male'),
   ...>     ('Student2', '1990-02-02', 'Female'),
   ...>     ('Student3', '1990-03-03', 'Other'),
   ...>     ('Student4', '1990-04-04', 'Male'),
   ...>     ('Student5', '1990-04-04', 'Female'),
   ...>     ('Student6', '1990-05-05', 'Other'),
   ...>     ('Student7', '1990-06-06', 'Male'),
   ...>     ('Student8', '1990-07-07', 'Female'),
   ...>     ('Student9', '1990-08-08', 'Other'),
   ...>     ('Student10', '1990-09-09', 'Male'),
   ...>     ('Student11', '1990-10-10', 'Female'),
   ...>     ('Student12', '1990-11-11', 'Other'),
   ...>     ('Student13', '1990-12-12', 'Male'),
   ...>     ('Student14', '1990-01-25', 'Female'),
   ...>     ('Student15', '1990-05-27', 'Other');
sqlite> INSERT INTO STudent (name, birthdate, gender) VALUES
   ...>     ('Student16', '1980-01-01', 'Male'),
   ...>     ('Student17', '1980-02-02', 'Female'),
   ...>     ('Student18', '1980-03-03', 'Other'),
   ...>     ('Student19', '1980-04-04', 'Male'),
   ...>     ('Student20', '1980-05-05', 'Female');
sqlite> INSERT INTO STudent (name, birthdate, gender) VALUES
   ...>     ('Student21', '1995-01-01', 'Male'),
   ...>     ('Student22', '1995-02-02', 'Female'),
   ...>     ('Student23', '1995-03-03', 'Other'),
   ...>     ('Student24', '1995-04-04', 'Male'),
   ...>     ('Student25', '1995-04-04', 'Female'),
   ...>     ('Student26', '1995-05-05', 'Other'),
   ...>     ('Student27', '1995-06-06', 'Male'),
   ...>     ('Student28', '1995-07-07', 'Female'),
   ...>     ('Student29', '1995-08-08', 'Other'),
   ...>     ('Student30', '1995-09-09', 'Male');
```

```
sqlite> select * from STudent;
1|Student1|1990-01-01|Male
2|Student2|1990-02-02|Female
3|Student3|1990-03-03|Other
4|Student4|1990-04-04|Male
5|Student5|1990-04-04|Female
6|Student6|1990-05-05|Other
7|Student7|1990-06-06|Male
8|Student8|1990-07-07|Female
9|Student9|1990-08-08|Other
10|Student10|1990-09-09|Male
11|Student11|1990-10-10|Female
12|Student12|1990-11-11|Other
13|Student13|1990-12-12|Male
14|Student14|1990-01-25|Female
15|Student15|1990-05-27|Other
16|Student16|1980-01-01|Male
17|Student17|1980-02-02|Female
18|Student18|1980-03-03|Other
19|Student19|1980-04-04|Male
20|Student20|1980-05-05|Female
21|Student21|1995-01-01|Male
22|Student22|1995-02-02|Female
23|Student23|1995-03-03|Other
24|Student24|1995-04-04|Male
25|Student25|1995-04-04|Female
26|Student26|1995-05-05|Other
27|Student27|1995-06-06|Male
28|Student28|1995-07-07|Female
29|Student29|1995-08-08|Other
30|Student30|1995-09-09|Male
sqlite>
```

```
sqlite> select * from Teacher;
1|Teacher1|2013-07-22 10:35:17|2024-07-05 12:15:00
2|Teacher2|2014-09-18 15:20:42|2024-07-05 12:15:00
3|Teacher3|2012-11-30 08:05:53|2024-07-05 12:15:00
4|Teacher4|2015-01-05 18:44:29|2024-07-05 12:15:00
5|Teacher5|2012-04-12 07:55:12|2024-07-05 12:15:00
6|Teacher6|2013-12-29 14:28:50|2024-07-05 12:15:00
7|Teacher7|2014-06-17 09:10:04|2024-07-05 12:15:00
```

```
sqlite> INSERT INTO Teacher (name, create_dt, update_dt) VALUES
   ...>     ('Teacher1', '2013-07-22 10:35:17', '2024-07-05 12:15:00'),
   ...>     ('Teacher2', '2014-09-18 15:20:42', '2024-07-05 12:15:00'),
   ...>     ('Teacher3', '2012-11-30 08:05:53', '2024-07-05 12:15:00'),
   ...>     ('Teacher4', '2015-01-05 18:44:29', '2024-07-05 12:15:00'),
   ...>     ('Teacher5', '2012-04-12 07:55:12', '2024-07-05 12:15:00'),
   ...>     ('Teacher6', '2013-12-29 14:28:50', '2024-07-05 12:15:00'),
   ...>     ('Teacher7', '2014-06-17 09:10:04', '2024-07-05 12:15:00');
sqlite> CREATE TABLE Course (
   ...>     cid INTEGER PRIMARY KEY,
   ...>     name TEXT,
   ...>     tid INTEGER,
   ...>     create_dt DATETIME,
   ...>     update_dt DATETIME,
   ...>     FOREIGN KEY (tid) REFERENCES Teacher(tid)
   ...> );
sqlite> INSERT INTO Course (name, tid, create_dt, update_dt) VALUES
   ...>     ('Mandarin', 1, '2010-04-25 09:23:17', '2024-07-05 12:15:00'),
   ...>     ('Math', 2, '2010-06-15 14:08:42', '2024-07-05 12:15:00'),
   ...>     ('English', 3, '2010-05-18 08:55:53', '2024-07-05 12:15:00');
sqlite> CREATE TABLE Score (
   ...>     sid INTEGER PRIMARY KEY,
   ...>     cid TEXT PRIMARY KEY,
   ...>     score INTEGER,
   ...>     create_dt DATETIME
   ...> );
Parse error: table "Score" has more than one primary key
sqlite> CREATE TABLE Score (
   ...>     sid INTEGER,
   ...>     cid TEXT,
   ...>     score INTEGER,
   ...>     create_dt DATETIME,
   ...>     PRIMARY KEY (sid, cid),
   ...>     FOREIGN KEY (sid) REFERENCES STudent(sid),
   ...>     FOREIGN KEY (cid) REFERENCES Course(name)
```

```
sqlite> INSERT INTO Score (sid, cid, score, create_dt) VALUES
   ...> (1, 'Mandarin', 85, '2024-07-05 12:15:00'),
   ...> (1, 'Math', 85, '2024-07-05 12:15:00'),
   ...> (1, 'English', 85, '2024-07-05 12:15:00'),
   ...> (2, 'Mandarin', 90, '2024-07-05 12:15:00'),
   ...> (2, 'Math', 90, '2024-07-05 12:15:00'),
   ...> (2, 'English', 90, '2024-07-05 12:15:00'),
   ...> (3, 'Mandarin', 88, '2024-07-05 12:15:00'),
   ...> (3, 'Math', 88, '2024-07-05 12:15:00'),
   ...> (3, 'English', 88, '2024-07-05 12:15:00'),
   ...> (4, 'Mandarin', 85, '2024-07-05 12:15:00'),
   ...> (4, 'Math', 85, '2024-07-05 12:15:00'),
   ...> (4, 'English', 85, '2024-07-05 12:15:00'),
   ...> (5, 'Mandarin', 90, '2024-07-05 12:15:00'),
   ...> (5, 'Math', 90, '2024-07-05 12:15:00'),
   ...> (5, 'English', 90, '2024-07-05 12:15:00'),
   ...> (6, 'Mandarin', 85, '2024-07-05 12:15:00'),
   ...> (6, 'Math', 85, '2024-07-05 12:15:00'),
   ...> (6, 'English', 85, '2024-07-05 12:15:00'),
   ...> (7, 'Mandarin', 90, '2024-07-05 12:15:00'),
   ...> (7, 'Math', 90, '2024-07-05 12:15:00'),
   ...> (7, 'English', 90, '2024-07-05 12:15:00'),
   ...> (8, 'Mandarin', 85, '2024-07-05 12:15:00'),
   ...> (8, 'Math', 85, '2024-07-05 12:15:00'),
   ...> (8, 'English', 85, '2024-07-05 12:15:00'),
   ...> (9, 'Mandarin', 90, '2024-07-05 12:15:00'),
   ...> (9, 'Math', 90, '2024-07-05 12:15:00'),
   ...> (9, 'English', 90, '2024-07-05 12:15:00'),
   ...> (10, 'Mandarin', 85, '2024-07-05 12:15:00'),
   ...> (10, 'Math', 85, '2024-07-05 12:15:00'),
   ...> (10, 'English', 85, '2024-07-05 12:15:00');
```

```
sqlite> INSERT INTO Score (sid, cid, score, create_dt) VALUES
   ...> (11, 'Mandarin', 60, '2024-07-05 12:15:00'),
   ...> (11, 'Math', 68, '2024-07-05 12:15:00'),
   ...> (11, 'English', 68, '2024-07-05 12:15:00'),
   ...> (12, 'Mandarin', 65, '2024-07-05 12:15:00'),
   ...> (12, 'Math', 68, '2024-07-05 12:15:00'),
   ...> (12, 'English', 68, '2024-07-05 12:15:00'),
   ...> (13, 'Mandarin', 55, '2024-07-05 12:15:00'),
   ...> (13, 'Math', 68, '2024-07-05 12:15:00'),
   ...> (13, 'English', 68, '2024-07-05 12:15:00'),
   ...> (14, 'Mandarin', 70, '2024-07-05 12:15:00'),
   ...> (14, 'Math', 68, '2024-07-05 12:15:00'),
   ...> (14, 'English', 68, '2024-07-05 12:15:00'),
   ...> (15, 'Mandarin', 62, '2024-07-05 12:15:00'),
   ...> (15, 'Math', 68, '2024-07-05 12:15:00'),
   ...> (15, 'English', 68, '2024-07-05 12:15:00');
```

```
sqlite> INSERT INTO Score (sid, cid, score, create_dt) VALUES
   ...> (16, 'Mandarin', 85, '2024-07-05 12:15:00'),
   ...> (16, 'Math', 88, '2024-07-05 12:15:00'),
   ...> (16, 'English', 90, '2024-07-05 12:15:00'),
   ...> (17, 'Mandarin', 90, '2024-07-05 12:15:00'),
   ...> (17, 'Math', 85, '2024-07-05 12:15:00'),
   ...> (17, 'English', 80, '2024-07-05 12:15:00'),
   ...> (18, 'Mandarin', 78, '2024-07-05 12:15:00'),
   ...> (18, 'Math', 92, '2024-07-05 12:15:00'),
   ...> (18, 'English', 75, '2024-07-05 12:15:00'),
   ...> (19, 'Mandarin', 82, '2024-07-05 12:15:00'),
   ...> (19, 'Math', 80, '2024-07-05 12:15:00'),
   ...> (19, 'English', 85, '2024-07-05 12:15:00'),
   ...> (20, 'Mandarin', 75, '2024-07-05 12:15:00'),
```

```
20, 'Math', 78, '2024-07-05 12:15:00'),
20, 'English', 80, '2024-07-05 12:15:00'),
21, 'Mandarin', 85, '2024-07-05 12:15:00'),
21, 'Math', 90, '2024-07-05 12:15:00'),
21, 'English', 92, '2024-07-05 12:15:00'),
22, 'Mandarin', 90, '2024-07-05 12:15:00'),
22, 'Math', 85, '2024-07-05 12:15:00'),
22, 'English', 80, '2024-07-05 12:15:00'),
23, 'Mandarin', 78, '2024-07-05 12:15:00'),
23, 'Math', 82, '2024-07-05 12:15:00'),
23, 'English', 85, '2024-07-05 12:15:00'),
24, 'Mandarin', 75, '2024-07-05 12:15:00'),
24, 'Math', 78, '2024-07-05 12:15:00'),
24, 'English', 80, '2024-07-05 12:15:00'),
25, 'Mandarin', 85, '2024-07-05 12:15:00'),
25, 'Math', 90, '2024-07-05 12:15:00'),
25, 'English', 92, '2024-07-05 12:15:00');   ...> (20, 'Math', 78, '2024-07-05 12:15:00'),
  ...> (20, 'English', 80, '2024-07-05 12:15:00'),
  ...> (21, 'Mandarin', 85, '2024-07-05 12:15:00'),
  ...> (21, 'Math', 90, '2024-07-05 12:15:00'),
  ...> (21, 'English', 92, '2024-07-05 12:15:00'),
  ...> (22, 'Mandarin', 90, '2024-07-05 12:15:00'),
  ...> (22, 'Math', 85, '2024-07-05 12:15:00'),
  ...> (22, 'English', 80, '2024-07-05 12:15:00'),
  ...> (23, 'Mandarin', 78, '2024-07-05 12:15:00'),
  ...> (23, 'Math', 82, '2024-07-05 12:15:00'),
  ...> (23, 'English', 85, '2024-07-05 12:15:00'),
  ...> (24, 'Mandarin', 75, '2024-07-05 12:15:00'),
  ...> (24, 'Math', 78, '2024-07-05 12:15:00'),
  ...> (24, 'English', 80, '2024-07-05 12:15:00'),
  ...> (25, 'Mandarin', 85, '2024-07-05 12:15:00'),
  ...> (25, 'Math', 90, '2024-07-05 12:15:00'),
  ...> (25, 'English', 92, '2024-07-05 12:15:00');
```

```
sqlite> select * from Course;
1|Mandarin|1|2010-04-25 09:23:17|2024-07-05 12:15:00
2|Math|2|2010-06-15 14:08:42|2024-07-05 12:15:00
3|English|3|2010-05-18 08:55:53|2024-07-05 12:15:00
sqlite>
```

```
sqlite> select * from Score;
1|Mandarin|85|2024-07-05 12:15:00
1|Math|85|2024-07-05 12:15:00
1|English|85|2024-07-05 12:15:00
2|Mandarin|90|2024-07-05 12:15:00
2|Math|90|2024-07-05 12:15:00
2|English|90|2024-07-05 12:15:00
3|Mandarin|88|2024-07-05 12:15:00
3|Math|88|2024-07-05 12:15:00
3|English|88|2024-07-05 12:15:00
4|Mandarin|85|2024-07-05 12:15:00
4|Math|85|2024-07-05 12:15:00
4|English|85|2024-07-05 12:15:00
5|Mandarin|90|2024-07-05 12:15:00
5|Math|90|2024-07-05 12:15:00
5|English|90|2024-07-05 12:15:00
6|Mandarin|85|2024-07-05 12:15:00
6|Math|85|2024-07-05 12:15:00
6|English|85|2024-07-05 12:15:00
7|Mandarin|90|2024-07-05 12:15:00
7|Math|90|2024-07-05 12:15:00
7|English|90|2024-07-05 12:15:00
8|Mandarin|85|2024-07-05 12:15:00
8|Math|85|2024-07-05 12:15:00
8|English|85|2024-07-05 12:15:00
9|Mandarin|90|2024-07-05 12:15:00
9|Math|90|2024-07-05 12:15:00
9|English|90|2024-07-05 12:15:00
10|Mandarin|85|2024-07-05 12:15:00
10|Math|85|2024-07-05 12:15:00
10|English|85|2024-07-05 12:15:00
11|Mandarin|60|2024-07-05 12:15:00
11|Math|68|2024-07-05 12:15:00
11|English|68|2024-07-05 12:15:00
12|Mandarin|65|2024-07-05 12:15:00
12|Math|68|2024-07-05 12:15:00
12|English|68|2024-07-05 12:15:00
13|Mandarin|55|2024-07-05 12:15:00
13|Math|68|2024-07-05 12:15:00
13|English|68|2024-07-05 12:15:00
14|Mandarin|70|2024-07-05 12:15:00
14|Math|68|2024-07-05 12:15:00
14|English|68|2024-07-05 12:15:00
15|Mandarin|62|2024-07-05 12:15:00
15|Math|68|2024-07-05 12:15:00
15|English|68|2024-07-05 12:15:00
16|Mandarin|85|2024-07-05 12:15:00
16|Math|88|2024-07-05 12:15:00
16|English|90|2024-07-05 12:15:00
17|Mandarin|90|2024-07-05 12:15:00
```

```
17|Math|85|2024-07-05 12:15:00
17|English|80|2024-07-05 12:15:00
18|Mandarin|78|2024-07-05 12:15:00
18|Math|92|2024-07-05 12:15:00
18|English|75|2024-07-05 12:15:00
19|Mandarin|82|2024-07-05 12:15:00
19|Math|80|2024-07-05 12:15:00
19|English|85|2024-07-05 12:15:00
20|Mandarin|75|2024-07-05 12:15:00
20|Math|78|2024-07-05 12:15:00
20|English|80|2024-07-05 12:15:00
21|Mandarin|85|2024-07-05 12:15:00
21|Math|90|2024-07-05 12:15:00
21|English|92|2024-07-05 12:15:00
22|Mandarin|90|2024-07-05 12:15:00
22|Math|85|2024-07-05 12:15:00
22|English|80|2024-07-05 12:15:00
23|Mandarin|78|2024-07-05 12:15:00
23|Math|82|2024-07-05 12:15:00
23|English|85|2024-07-05 12:15:00
24|Mandarin|75|2024-07-05 12:15:00
24|Math|78|2024-07-05 12:15:00
24|English|80|2024-07-05 12:15:00
25|Mandarin|85|2024-07-05 12:15:00
25|Math|90|2024-07-05 12:15:00
25|English|92|2024-07-05 12:15:00
```

How many student that having score between 75 to 80 in Mandarin but lower value than they having in other course.

```
sqlite> SELECT COUNT(*) AS num_students
   ...> FROM Score s1
   ...> JOIN Score s2 ON s1.sid = s2.sid
   ...> WHERE s1.cid = 'Mandarin'
   ...>   AND s1.score BETWEEN 75 AND 80
   ...>   AND s1.score < s2.score
   ...>   AND s2.cid <> 'Mandarin';
7
sqlite>
```

Create segment of course score [100-85], [85-70], [70-60], [<60] and count number of students under those segments for all courses, column to display also are course and teacher's name.

```
sqlite> WITH ScoreSegments AS (
   ...>     SELECT
   ...>         s.sid,
   ...>         s.cid,
   ...>         s.score,
   ...>         c.name AS course_name,
   ...>         t.name AS teacher_name,
   ...>         CASE
   ...>             WHEN s.score >= 85 THEN '[100-85]'
   ...>             WHEN s.score >= 70 THEN '[85-70]'
   ...>             WHEN s.score >= 60 THEN '[70-60]'
   ...>             ELSE '[<60]'
   ...>         END AS score_segment
   ...>     FROM Score s
   ...>     JOIN Course c ON s.cid = c.name
   ...>     JOIN Teacher t ON c.tid = t.tid
   ...> )
   ...> SELECT
   ...>     course_name,
   ...>     teacher_name,
   ...>     score_segment,
   ...>     COUNT(DISTINCT sid) AS num_students
   ...> FROM ScoreSegments
   ...> GROUP BY course_name, teacher_name, score_segment
   ...> ORDER BY course_name, teacher_name, score_segment DESC;
English|Teacher3|[85-70]|5
English|Teacher3|[70-60]|5
English|Teacher3|[100-85]|15
Mandarin|Teacher1|[<60]|1
Mandarin|Teacher1|[85-70]|6
Mandarin|Teacher1|[70-60]|3
Mandarin|Teacher1|[100-85]|15
Math|Teacher2|[85-70]|4
Math|Teacher2|[70-60]|5
Math|Teacher2|[100-85]|16
sqlite>
```

Display student name, gender and score where student has the same score but in different course.

```
1|Student1|Male|85|English|Mandarin
1|Student1|Male|85|English|Math
1|Student1|Male|85|Mandarin|English
1|Student1|Male|85|Mandarin|Math
1|Student1|Male|85|Math|English
1|Student1|Male|85|Math|Mandarin
2|Student2|Female|90|English|Mandarin
2|Student2|Female|90|English|Math
2|Student2|Female|90|Mandarin|English
2|Student2|Female|90|Mandarin|Math
2|Student2|Female|90|Math|English
2|Student2|Female|90|Math|Mandarin
3|Student3|Other|88|English|Mandarin
3|Student3|Other|88|English|Math
3|Student3|Other|88|Mandarin|English
3|Student3|Other|88|Mandarin|Math
3|Student3|Other|88|Math|English
3|Student3|Other|88|Math|Mandarin
4|Student4|Male|85|English|Mandarin
4|Student4|Male|85|English|Math
4|Student4|Male|85|Mandarin|English
4|Student4|Male|85|Mandarin|Math
4|Student4|Male|85|Math|English
4|Student4|Male|85|Math|Mandarin
5|Student5|Female|90|English|Mandarin
5|Student5|Female|90|English|Math
5|Student5|Female|90|Mandarin|English
5|Student5|Female|90|Mandarin|Math
5|Student5|Female|90|Math|English
5|Student5|Female|90|Math|Mandarin
6|Student6|Other|85|English|Mandarin
6|Student6|Other|85|English|Math
6|Student6|Other|85|Mandarin|English
6|Student6|Other|85|Mandarin|Math
6|Student6|Other|85|Math|English
6|Student6|Other|85|Math|Mandarin
7|Student7|Male|90|English|Mandarin
7|Student7|Male|90|English|Math
7|Student7|Male|90|Mandarin|English
7|Student7|Male|90|Mandarin|Math
7|Student7|Male|90|Math|English
7|Student7|Male|90|Math|Mandarin
```

```
8|Student8|Female|85|English|Mandarin
8|Student8|Female|85|English|Math
8|Student8|Female|85|Mandarin|English
8|Student8|Female|85|Mandarin|Math
8|Student8|Female|85|Math|English
8|Student8|Female|85|Math|Mandarin
9|Student9|Other|90|English|Mandarin
9|Student9|Other|90|English|Math
9|Student9|Other|90|Mandarin|English
9|Student9|Other|90|Mandarin|Math
9|Student9|Other|90|Math|English
9|Student9|Other|90|Math|Mandarin
10|Student10|Male|85|English|Mandarin
10|Student10|Male|85|English|Math
10|Student10|Male|85|Mandarin|English
10|Student10|Male|85|Mandarin|Math
10|Student10|Male|85|Math|English
10|Student10|Male|85|Math|Mandarin
11|Student11|Female|68|English|Math
11|Student11|Female|68|Math|English
12|Student12|Other|68|English|Math
12|Student12|Other|68|Math|English
13|Student13|Male|68|English|Math
13|Student13|Male|68|Math|English
14|Student14|Female|68|English|Math
14|Student14|Female|68|Math|English
15|Student15|Other|68|English|Math
15|Student15|Other|68|Math|English
sqlite>
```

Show top 3 highest in scoring from each course and display column course name, student name and student score.

```
qlite> WITH RankedScores AS (
  ...>     SELECT
  ...>         s.sid,
  ...>         s.cid,
  ...>         s.score,
  ...>         ROW_NUMBER() OVER (PARTITION BY s.cid ORDER BY s.score DESC) AS rank
  ...>     FROM Score s
  ...> )
  ...> SELECT
  ...>     c.name AS course_name,
  ...>     st.name AS student_name,
  ...>     rs.score AS student_score
  ...> FROM RankedScores rs
  ...> JOIN Course c ON rs.cid = c.name
  ...> JOIN STudent st ON rs.sid = st.sid
  ...> WHERE rs.rank <= 3
  ...> ORDER BY course_name, student_score DESC;
nglish|Student21|92
nglish|Student25|92
nglish|Student2|90
andarin|Student2|90
andarin|Student5|90
andarin|Student7|90
ath|Student18|92
ath|Student2|90
ath|Student5|90
qlite>
```