```
1    SQL> SET ECHO ON
2    SQL> SET DEFINE OFF
3    SQL> /*
4    SQL> CIS 353 - Database Design Project
5    SQL> Jarrod Parr
6    SQL> Kyle Flynn
7    SQL> Brendon Caywoood
8    SQL> Santiago Quirogas
9    SQL> */
10   SQL> DROP TABLE district_ranking CASCADE CONSTRAINTS;
11
12   Table dropped.
13
14   SQL> DROP TABLE team CASCADE CONSTRAINTS;
15
16   Table dropped.
17
18   SQL> DROP TABLE event CASCADE CONSTRAINTS;
19
20   Table dropped.
21
22   SQL> DROP TABLE "match" CASCADE CONSTRAINTS;
23
24   Table dropped.
25
26   SQL> DROP TABLE match_participant CASCADE CONSTRAINTS;
27
28   Table dropped.
29
30   SQL> DROP TABLE awards CASCADE CONSTRAINTS;
31
32   Table dropped.
33
34   SQL> DROP TABLE years_active CASCADE CONSTRAINTS;
35
36   Table dropped.
37
38   SQL> DROP TABLE registration CASCADE CONSTRAINTS;
39
40   Table dropped.
41
42   SQL> --
43   SQL> CREATE TABLE team (
44     2    teamNumber  number(4),
45     3    teamName    varchar2(30),
46     4    teamOrigin  varchar2(50),
47     5    "state"     varchar2(2),
48     6    city    varchar2(25),
49     7    CONSTRAINT BC3 CHECK (teamName IS NOT NULL),
50     8    CONSTRAINT BC4 PRIMARY KEY (teamNumber)
51     9  );
52
53   Table created.
54
55   SQL> --
56   SQL> CREATE TABLE district_ranking (
57     2    rankID       number(3) PRIMARY KEY,
58     3    teamNumber   number(4),
59     4    districtPoints   number(3),
60     5    advancedToStates number(1),
61     6    CONSTRAINT BC2 FOREIGN KEY (teamNumber) REFERENCES team(teamNumber) /* BC2 */
62     7         ON DELETE SET NULL
63     8         DEFERRABLE INITIALLY DEFERRED
64     9  );
65
66   Table created.
67
68   SQL> --
69   SQL> CREATE TABLE event (
```

```
70      2    eventID     varchar(15),
71      3    weekOfComp  number(1),
72      4    eventName   varchar2(40),
73      5    "state"     varchar2(2),
74      6    city    varchar2(25),
75      7    venue       varchar2(40),
76      8    CONSTRAINT BC1 PRIMARY KEY(eventID) /* BC1 */
77      9  );
78
79   Table created.
80
81   SQL> --
82   SQL> CREATE TABLE years_active (
83      2    teamNumber  number(4) PRIMARY KEY,
84      3    years       number(2)
85      4  );
86
87   Table created.
88
89   SQL> --
90   SQL> CREATE TABLE registration (
91      2    eventID     varchar2(15),
92      3    teamNumber  number(4),
93      4    didPayFee   number(1),
94      5    PRIMARY KEY(eventID, teamNumber)
95      6  );
96
97   Table created.
98
99   SQL> --
100  SQL> CREATE TABLE awards (
101     2    eventID     varchar2(15),
102     3    awardName   varchar2(30),
103     4    teamNumber  number(4),
104     5    points      number(2),
105     6    PRIMARY KEY(eventID, awardName)
106     7  );
107
108  Table created.
109
110  SQL> --
111  SQL> CREATE TABLE "match" (
112     2    matchID     varchar2(20) PRIMARY KEY,
113     3    eventID     varchar2(15),
114     4    "level"     number(2),
115     5    matchName   varchar2(25),
116     6    redScore    number(3),
117     7    blueScore   number(3),
118     8    CONSTRAINT BC5 CHECK (redScore > 0 AND blueScore > 0)
119     9  );
120
121  Table created.
122
123  SQL> --
124  SQL> CREATE TABLE match_participant (
125     2    matchID     varchar2(20),
126     3    teamNumber  number(4),
127     4    alliance    varchar2(4),
128     5    didShow     number(1),
129     6    PRIMARY KEY(matchID, teamNumber)
130     7  );
131
132  Table created.
133
134  SQL> --
135  SQL> /* In the DDL, every IC must have a unique name; e.g. IC5, IC10, IC15, etc. */
136  SQL> --
137  SQL> SET FEEDBACK OFF
138  SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city)VALUES (1, 'The
```

```
       Juggernauts', 'Molex & Oakland Schools', 'MI', 'Pontiac');
139    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (33,
       'Killer Bees', 'Notre Dame Preparatory', 'MI', 'Auburn Hills');
140    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (67,
       'The HOT Team', 'Huron Valley Schools', 'MI', 'Highland');
141    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (469,
       'Las Guerrillas', 'Gormans Gallery & International Academy', 'MI', 'Bloomfield Hills');
142    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (1023,
       'Bedford Express', 'Bedford Senior High School', 'MI', 'Bedford');
143    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (1918,
       'NC Gears', 'Newaygo County', 'MI', 'Fremont');
144    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (2767,
       'Stryke Force', 'Kalamazoo County', 'MI', 'Kalamazoo');
145    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (3618,
       'Petoskey Paladins', 'Petoskey High School', 'MI', 'Petoskey');
146    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (4003,
       'TriSonics', 'Allendale & Jenison Schools', 'MI', 'Allendale');
147    SQL> INSERT INTO team (teamNumber, teamName, teamOrigin, "state", city) VALUES (5980,
       'East Grand Rapids Robotics', 'East Grand Rapids High School', 'MI', 'Grand Rapids');
148    SQL> --
149    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (1, 4003, 147, 1);
150    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (2, 2767, 146, 0);
151    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (3, 1918, 142, 0);
152    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (4, 33, 140, 0);
153    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (5, 67, 139, 0);
154    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (6, 1023, 137, 0);
155    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (7, 5980, 130, 0);
156    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (8, 3618, 100, 1);
157    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (9, 1, 82, 0);
158    SQL> INSERT INTO district_ranking (rankID, teamNumber, districtPoints,
       advancedToStates) VALUES (10, 469, 79, 0);
159    SQL> --
160    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-TC', 1, 'Traverse City District Event', 'MI', 'Traverse City', 'Traverse City
       Central High School');
161    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-KU2', 2, 'Kettering University District Event #2', 'MI', 'Flint', 'Kettering
       University');
162    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-GULL', 3, 'Gull Lake District Event', 'MI', 'Richland', 'Gull Lake High
       School');
163    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-WMI', 4, 'West Michigan District Event', 'MI', 'Allendale', 'Grand Valley
       State University');
164    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-EK', 5, 'East Kentwood District Event', 'MI', 'East Kentwood', 'East Kentwood
       High School');
165    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-FH', 6, 'Forest Hills District Event', 'MI', 'Forest Hills', 'Forest Hills
       Central High School');
166    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-CMP', 7, 'Michigan State Championship', 'MI', 'Saginaw', 'Saginaw Valley State
       University');
167    SQL> --
168    SQL> INSERT INTO years_active (teamNumber, years) VALUES (1, 22);
169    SQL> INSERT INTO years_active (teamNumber, years) VALUES (33, 23);
170    SQL> INSERT INTO years_active (teamNumber, years) VALUES (67, 22);
171    SQL> INSERT INTO years_active (teamNumber, years) VALUES (469, 19);
172    SQL> INSERT INTO years_active (teamNumber, years) VALUES (1023, 16);
173    SQL> INSERT INTO years_active (teamNumber, years) VALUES (1918, 13);
```

```
174   SQL> INSERT INTO years_active (teamNumber, years) VALUES (2767, 10);
175   SQL> INSERT INTO years_active (teamNumber, years) VALUES (3618, 9);
176   SQL> INSERT INTO years_active (teamNumber, years) VALUES (4003, 8);
177   SQL> INSERT INTO years_active (teamNumber, years) VALUES (5980, 3);
178   SQL> --
179   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-WMI',
      'Chairmans Award', 4003, 10);
180   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-EI',
      'Engineering Inspiration', 3618, 8);
181   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-KU2',
      'Innovation in Control', 4003, 5);
182   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-CHM',
      'Chairmans Award', 469, 10);
183   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-EK',
      'Innovation in Control', 2767, 5);
184   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-FH',
      'Event Winner', 1023, 20);
185   SQL> INSERT INTO awards (eventID, awardName, teamNumber, points) VALUES ('18-FIM-CMP',
      'Event Winner', 4003, 60);
186   SQL> --
187   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-TC',
      3618, 1);
188   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-TC',
      1918, 1);
189   SQL> --
190   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-KU2',
      4003, 1);
191   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-KU2',
      469, 1);
192   SQL> --
193   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-GULL',
      3618, 1);
194   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-GULL',
      469, 1);
195   SQL> --
196   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-WMI',
      4003, 1);
197   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-WMI',
      5980, 1);
198   SQL> --
199   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-EK',
      2767, 1);
200   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-EK', 1,
      1);
201   SQL> --
202   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-FH', 33,
      1);
203   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-FH', 67,
      1);
204   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-FH',
      1023, 1);
205   SQL> INSERT INTO registration (eventID, teamNumber, didPayFee) VALUES ('18-FIM-FH',
      503, 1);
206   SQL> --
207   SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
      VALUES ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 1 Match 1', 387, 398);
208   SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
      VALUES ('18-FIM-FH-E02', '18-FIM-FH', 11, 'Quarterfinals 2 Match 1', 50, 400);
209   SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
      VALUES ('18-FIM-FH-E03', '18-FIM-FH', 12, 'Quarterfinals 3 Match 1', 356, 354);
210   SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
      VALUES ('18-FIM-FH-E04', '18-FIM-FH', 13, 'Quarterfinals 4 Match 1', 247, 247);
211   SQL> --
212   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
      ('18-FIM-FH-E01', 1023, 'red', 1);
213   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
      ('18-FIM-FH-E01', 67, 'blue', 1);
214   SQL> --
215   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
```

```
              ('18-FIM-FH-E02', 33, 'red', 1);
216   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
              ('18-FIM-FH-E02', 503, 'blue', 1);
217   SQL> --
218   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
              ('18-FIM-FH-E03', 4003, 'red', 1);
219   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
              ('18-FIM-FH-E03', 5980, 'blue', 1);
220   SQL> --
221   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
              ('18-FIM-FH-E04', 1, 'red', 1);
222   SQL> INSERT INTO match_participant (matchID, teamNumber, alliance, didShow) VALUES
              ('18-FIM-FH-E04', 3618, 'blue', 1);
223   SQL> /* Important: Keep the number of rows in each table small enough so that the
      results of your
224   SQL> queries can be verified by hand. See the Sailors database as an example. */
225   SQL> SET FEEDBACK ON
226   SQL> COMMIT;
227
228   Commit complete.
229
230   SQL> --
231   SQL> SELECT * FROM team;
232
233   TEAMNUMBER TEAMNAME
234   ---------- ------------------------------
235   TEAMORIGIN                                       st CITY
236   ----------------------------------------------- -- ------------------------
237            1 The Juggernauts
238   Molex & Oakland Schools                         MI Pontiac
239
240           33 Killer Bees
241   Notre Dame Preparatory                          MI Auburn Hills
242
243           67 The HOT Team
244   Huron Valley Schools                            MI Highland
245
246
247   TEAMNUMBER TEAMNAME
248   ---------- ------------------------------
249   TEAMORIGIN                                       st CITY
250   ----------------------------------------------- -- ------------------------
251          469 Las Guerrillas
252   Gormans Gallery & International Academy          MI Bloomfield Hills
253
254         1023 Bedford Express
255   Bedford Senior High School                      MI Bedford
256
257         1918 NC Gears
258   Newaygo County                                  MI Fremont
259
260
261   TEAMNUMBER TEAMNAME
262   ---------- ------------------------------
263   TEAMORIGIN                                       st CITY
264   ----------------------------------------------- -- ------------------------
265         2767 Stryke Force
266   Kalamazoo County                                MI Kalamazoo
267
268         3618 Petoskey Paladins
269   Petoskey High School                            MI Petoskey
270
271         4003 TriSonics
272   Allendale & Jenison Schools                     MI Allendale
273
274
275   TEAMNUMBER TEAMNAME
276   ---------- ------------------------------
277   TEAMORIGIN                                       st CITY
```

```
     ---------------------------------------------------- -- ------------------------
         5980 East Grand Rapids Robotics
     East Grand Rapids High School                      MI Grand Rapids


     10 rows selected.

     SQL> SELECT * FROM years_active;

     TEAMNUMBER      YEARS
     ---------- ----------
              1         22
             33         23
             67         22
            469         19
           1023         16
           1918         13
           2767         10
           3618          9
           4003          8
           5980          3

     10 rows selected.

     SQL> SELECT * FROM event;

     EVENTID          WEEKOFCOMP EVENTNAME                                      st
     --------------- ---------- --------------------------------------- --
     CITY                       VENUE
     ------------------------ ---------------------------------------
     18-FIM-TC                 1 Traverse City District Event                  MI
     Traverse City              Traverse City Central High School

     18-FIM-KU2                2 Kettering University District Event #2  MI
     Flint                      Kettering University

     18-FIM-GULL               3 Gull Lake District Event                      MI
     Richland                   Gull Lake High School


     EVENTID          WEEKOFCOMP EVENTNAME                                      st
     --------------- ---------- --------------------------------------- --
     CITY                       VENUE
     ------------------------ ---------------------------------------
     18-FIM-WMI                4 West Michigan District Event                  MI
     Allendale                  Grand Valley State University

     18-FIM-EK                 5 East Kentwood District Event                  MI
     East Kentwood              East Kentwood High School

     18-FIM-FH                 6 Forest Hills District Event                   MI
     Forest Hills               Forest Hills Central High School


     EVENTID          WEEKOFCOMP EVENTNAME                                      st
     --------------- ---------- --------------------------------------- --
     CITY                       VENUE
     ------------------------ ---------------------------------------
     18-FIM-CMP                7 Michigan State Championship                   MI
     Saginaw                    Saginaw Valley State University


     7 rows selected.

     SQL> SELECT * FROM district_ranking;

         RANKID TEAMNUMBER DISTRICTPOINTS ADVANCEDTOSTATES
     ---------- ---------- -------------- ----------------
              1       4003            147                1
```

```
347          2       2767          146             0
348          3       1918          142             0
349          4         33          140             0
350          5         67          139             0
351          6       1023          137             0
352          7       5980          130             0
353          8       3618          100             1
354          9          1           82             0
355         10        469           79             0
356
357  10 rows selected.
358
359  SQL> SELECT * FROM registration;
360
361  EVENTID          TEAMNUMBER  DIDPAYFEE
362  --------------- ---------- ----------
363  18-FIM-TC             3618          1
364  18-FIM-TC             1918          1
365  18-FIM-KU2            4003          1
366  18-FIM-KU2             469          1
367  18-FIM-GULL           3618          1
368  18-FIM-GULL            469          1
369  18-FIM-WMI            4003          1
370  18-FIM-WMI            5980          1
371  18-FIM-EK             2767          1
372  18-FIM-EK                1          1
373  18-FIM-FH               33          1
374
375  EVENTID          TEAMNUMBER  DIDPAYFEE
376  --------------- ---------- ----------
377  18-FIM-FH               67          1
378  18-FIM-FH             1023          1
379  18-FIM-FH              503          1
380
381  14 rows selected.
382
383  SQL> SELECT * FROM awards;
384
385  EVENTID          AWARDNAME                       TEAMNUMBER     POINTS
386  --------------- ------------------------------ ---------- ----------
387  18-FIM-WMI       Chairmans Award                       4003         10
388  18-FIM-EI        Engineering Inspiration               3618          8
389  18-FIM-KU2       Innovation in Control                 4003          5
390  18-FIM-CHM       Chairmans Award                        469         10
391  18-FIM-EK        Innovation in Control                 2767          5
392  18-FIM-FH        Event Winner                          1023         20
393  18-FIM-CMP       Event Winner                          4003         60
394
395  7 rows selected.
396
397  SQL> SELECT * FROM "match";
398
399  MATCHID              EVENTID              level MATCHNAME
400  -------------------- --------------- ---------- -------------------------
401     REDSCORE  BLUESCORE
402  ---------- ----------
403  18-FIM-FH-E01        18-FIM-FH               10 Quarterfinals 1 Match 1
404        387        398
405
406  18-FIM-FH-E02        18-FIM-FH               11 Quarterfinals 2 Match 1
407         50        400
408
409  18-FIM-FH-E03        18-FIM-FH               12 Quarterfinals 3 Match 1
410        356        354
411
412
413  MATCHID              EVENTID              level MATCHNAME
414  -------------------- --------------- ---------- -------------------------
415     REDSCORE  BLUESCORE
```

```
416    ---------- ----------
417    18-FIM-FH-E04        18-FIM-FH              13 Quarterfinals 4 Match 1
418          247        247
419
420
421    4 rows selected.
422
423    SQL> SELECT * FROM match_participant;
424
425    MATCHID               TEAMNUMBER ALLI   DIDSHOW
426    -------------------- ---------- ---- ----------
427    18-FIM-FH-E01              1023 red            1
428    18-FIM-FH-E01                67 blue           1
429    18-FIM-FH-E02                33 red            1
430    18-FIM-FH-E02               503 blue           1
431    18-FIM-FH-E03              4003 red            1
432    18-FIM-FH-E03              5980 blue           1
433    18-FIM-FH-E04                 1 red            1
434    18-FIM-FH-E04              3618 blue           1
435
436    8 rows selected.
437
438    SQL> --
439    SQL> --< The SQL queries>
440    SQL> --
441    SQL> --< 1. A join involving at least four relations. >--
442    SQL> -- Find the team number, years, rank, and award name of every team to win an award
       at an event.
443    SQL> SELECT DISTINCT t.teamNumber, y.years, r.rankID, a.awardName
444      2          FROM team t, event e, district_ranking r, years_active y, awards a
445      3          WHERE t.teamNumber = y.teamNumber AND
446      4             t.teamNumber = r.teamNumber AND
447      5             t.teamNumber = a.teamNumber
448      6          ORDER BY r.rankID;
449
450    TEAMNUMBER      YEARS     RANKID AWARDNAME
451    ---------- ---------- ---------- ------------------------------
452          4003          8          1 Chairmans Award
453          4003          8          1 Event Winner
454          4003          8          1 Innovation in Control
455          2767         10          2 Innovation in Control
456          1023         16          6 Event Winner
457          3618          9          8 Engineering Inspiration
458           469         19         10 Chairmans Award
459
460    7 rows selected.
461
462    SQL> --< 2. A self-join. >--
463    SQL> -- For every match, find the match that has a higher score than current selected
       match.
464    SQL> SELECT m1.matchName, m1.redScore, m2.matchName, m2.redScore
465      2          FROM "match" m1, "match" m2
466      3          WHERE m1.redScore > m2.redScore;
467
468    MATCHNAME                 REDSCORE MATCHNAME                 REDSCORE
469    ------------------------ ---------- ------------------------ ----------
470    Quarterfinals 1 Match 1        387 Quarterfinals 3 Match 1        356
471    Quarterfinals 1 Match 1        387 Quarterfinals 4 Match 1        247
472    Quarterfinals 1 Match 1        387 Quarterfinals 2 Match 1         50
473    Quarterfinals 3 Match 1        356 Quarterfinals 4 Match 1        247
474    Quarterfinals 3 Match 1        356 Quarterfinals 2 Match 1         50
475    Quarterfinals 4 Match 1        247 Quarterfinals 2 Match 1         50
476
477    6 rows selected.
478
479    SQL> --< 3. UNION, INTERSECT, and/or MINUS. >--
480    SQL> -- Find the highest scoring match for the red alliance, and the highest scoring
       match for the blue alliance.
481    SQL> SELECT * FROM "match" WHERE redScore=(SELECT MAX(redScore) FROM "match") UNION
```

```
        SELECT * FROM "match" WHERE blueScore=(SELECT MAX(blueScore) FROM "match");
482
483     MATCHID                 EVENTID            level MATCHNAME
484     -------------------- --------------- ---------- -------------------------
485       REDSCORE  BLUESCORE
486     ---------- ----------
487     18-FIM-FH-E01          18-FIM-FH                 10 Quarterfinals 1 Match 1
488            387        398
489
490     18-FIM-FH-E02          18-FIM-FH                 11 Quarterfinals 2 Match 1
491             50        400
492
493
494     2 rows selected.
495
496     SQL> --< 4. SUM, AVG, MAX, and/or MIN. >--
497     SQL> /* Find the max, average, and minimum years active of all teams **/
498     SQL> SELECT MAX(years) AS maxyears, AVG(years) AS averageYears, MIN(years) AS minYears
499       2    FROM years_active;
500
501       MAXYEARS AVERAGEYEARS   MINYEARS
502     ---------- ------------ ----------
503             23         14.5          3
504
505     1 row selected.
506
507     SQL> --< 5. GROUP BY, HAVING, and ORDER BY, all appearing in the same query >--
508     SQL> -- Select the teamNumber and total number of points for all teams at a match with
        at least 2 awards and at least 70 points.
509     SQL> SELECT t.teamNumber, COUNT(*), SUM(a.points)
510       2  FROM team t, awards a
511       3  WHERE t.teamNumber = a.teamNumber
512       4  GROUP BY t.teamNumber
513       5  HAVING COUNT(*) > 2
514       6        AND SUM(a.points) >= 70
515       7        ORDER BY t.teamNumber;
516
517     TEAMNUMBER   COUNT(*) SUM(A.POINTS)
518     ---------- ---------- -------------
519           4003          3            75
520
521     1 row selected.
522
523     SQL> --< 6. A correlated subquery. >--
524     SQL> -- Select the teamNumber of teams whose been active more than 10 years and have
        not won an award.
525     SQL> SELECT y.teamNumber
526       2      FROM years_active y
527       3      WHERE y.years > 10  AND
528       4          NOT EXISTS (SELECT a.awardName
529       5                      FROM awards a
530       6                          WHERE a.teamNumber=y.teamNumber);
531
532     TEAMNUMBER
533     ----------
534           1918
535             33
536              1
537             67
538
539     4 rows selected.
540
541     SQL> --< 7. A non-correlated subquery. >--
542     SQL> -- Select the teamNumber of teams whose been active more than 10 years and have
        not won an award.
543     SQL> SELECT y.teamNumber
544       2      FROM years_active y
545       3      WHERE y.years > 10  AND
546       4          y.teamNumber NOT IN (SELECT a.teamNumber
```

```
547       5                        FROM awards a);
548
549    TEAMNUMBER
550    ----------
551          1918
552            33
553             1
554            67
555
556    4 rows selected.
557
558    SQL> --< 8. A relational DIVISION query. >--
559    SQL> -- Find the team number of every team who has won every award called the
       'Chairmans Award'.
560    SQL> -- (HINT: This query should ALWAYS return 0 rows, because no single team can win
       every Chairmans Award.)
561    SQL> SELECT t.teamNumber
562      2        FROM team t
563      3            WHERE NOT EXISTS((SELECT a.eventID
564      4                        FROM awards a
565      5                            WHERE a.awardName = 'Chairmans Award')
566      6                            MINUS
567      7                          (SELECT a.eventID
568      8                           FROM event e, awards a
569      9                           WHERE a.teamNumber = t.teamNumber AND
570     10                              a.eventID = e.eventID AND
571     11                              a.awardName = 'Chairmans Award'));
572
573    no rows selected
574
575    SQL> --< 9. An outer join query.  >--
576    SQL> -- Find every match's match participants and show the match name, team number, and
       alliance color.
577    SQL> SELECT m.matchName, mp.teamNumber, mp.alliance
578      2          FROM match_participant mp
579      3          RIGHT OUTER JOIN "match" m
580      4          ON mp.matchID=m.matchID;
581
582    MATCHNAME                 TEAMNUMBER ALLI
583    ------------------------- ---------- ----
584    Quarterfinals 1 Match 1         1023 red
585    Quarterfinals 1 Match 1           67 blue
586    Quarterfinals 2 Match 1           33 red
587    Quarterfinals 2 Match 1          503 blue
588    Quarterfinals 3 Match 1         4003 red
589    Quarterfinals 3 Match 1         5980 blue
590    Quarterfinals 4 Match 1            1 red
591    Quarterfinals 4 Match 1         3618 blue
592
593    8 rows selected.
594
595    SQL> --< 10. A RANK query. >--
596    SQL> -- Find the rank of 140 in the district_ranking table.
597    SQL> SELECT RANK(140) WITHIN
598      2        GROUP (ORDER BY districtPoints) "Rank"
599      3        FROM district_ranking;
600
601          Rank
602    ----------
603             7
604
605    1 row selected.
606
607    SQL> --< 11. A Top-N query. >--
608    SQL> -- Find the top 2 youngest teams.
609    SQL> SELECT DISTINCT y.years
610      2          FROM years_active y
611      3          ORDER BY y.years
612      4          ASC FETCH FIRST 2 ROWS ONLY;
```

```
613
614         YEARS
615     ----------
616             3
617             8
618
619    2 rows selected.
620
621    SQL> --< The insert/delete/update statements to test the enforcement of ICs >
622    SQL> --
623    SQL> --< Testing The Unique Event ID constraint BC1 >--
624    SQL> INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-TC', 1, 'Traverse City District Event', 'MI', 'Traverse City', 'Traverse City
       Central High School');
625    INSERT INTO event (eventID, weekOfComp, eventName, "state", city, venue) VALUES
       ('18-FIM-TC', 1, 'Traverse City District Event', 'MI', 'Traverse City', 'Traverse City
       Central High School')
626    *
627    ERROR at line 1:
628    ORA-00001: unique constraint (FLYNNKY.BC1) violated
629
630
631    SQL> --
632    SQL> --< Testing the teamNumber must exist constraint BC2 >--
633    SQL> -- HINT: This query as is should create 1 row, BUT on 'COMMIT' it will provide a
       violation of the constraint.
634    SQL> INSERT INTO district_ranking(rankID, teamNumber, districtPoints, advancedToStates)
       VALUES(11, 75, 83, 0);
635
636    1 row created.
637
638    SQL> --
639    SQL> --< Testing constraint teamName must exist BC3 >--
640    SQL> INSERT INTO team(teamNumber, teamName, teamOrigin, "state", city) VALUES(7, NULL,
       'Grand Valley State University', 'MI', 'Allendale');
641    INSERT INTO team(teamNumber, teamName, teamOrigin, "state", city) VALUES(7, NULL,
       'Grand Valley State University', 'MI', 'Allendale')
642    *
643    ERROR at line 1:
644    ORA-02290: check constraint (FLYNNKY.BC3) violated
645
646
647    SQL> --
648    SQL> --< Testing constraint teamNumber must be unique BC4 >--
649    SQL> INSERT INTO team(teamNumber, teamName, teamOrigin, "state", city) VALUES(1, 'The
       Lakers', 'Grand Valley State University', 'MI', 'Allendale');
650    INSERT INTO team(teamNumber, teamName, teamOrigin, "state", city) VALUES(1, 'The
       Lakers', 'Grand Valley State University', 'MI', 'Allendale')
651    *
652    ERROR at line 1:
653    ORA-00001: unique constraint (FLYNNKY.BC4) violated
654
655
656    SQL> --
657    SQL> --< Testing constraint BC5 redScore and blueScore must be > 0 >--
658    SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
       VALUES ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 5 Match 1', -7, 398);
659    INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore) VALUES
       ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 5 Match 1', -7, 398)
660    *
661    ERROR at line 1:
662    ORA-02290: check constraint (FLYNNKY.BC5) violated
663
664
665    SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
       VALUES ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 6 Match 1', 320, -10);
666    INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore) VALUES
       ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 6 Match 1', 320, -10)
667    *
```

```
668   ERROR at line 1:
669   ORA-02290: check constraint (FLYNNKY.BC5) violated
670
671
672   SQL> INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore)
      VALUES ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 5 Match 1', -7, -10);
673   INSERT INTO "match" (matchID, eventID, "level", matchName, redScore, blueScore) VALUES
      ('18-FIM-FH-E01', '18-FIM-FH', 10, 'Quarterfinals 5 Match 1', -7, -10)
674   *
675   ERROR at line 1:
676   ORA-02290: check constraint (FLYNNKY.BC5) violated
677
678
679   SQL> COMMIT;
680   COMMIT
681   *
682   ERROR at line 1:
683   ORA-02091: transaction rolled back
684   ORA-02291: integrity constraint (FLYNNKY.BC2) violated - parent key not found
685
686
687   SQL> --
688   SQL> SPOOL OFF
689
```