***Information Management - HW 02***

***Submitted by: Ruchi Sharma, rs58898***

Given Data:

| StudID | StdFirstName | StdLastName | TotalScore | CourseName | Section | Stream |
|---|---|---|---|---|---|---|
| 135791 | Albert | Einstein | 99.98 | Physics | A | Accounting |
| 246802 | Homi | Bhabha | 99.99 | Physics | B | Finance |
| 147036 | Marie | Daly | 100 | Chemistry | A | IB |
| 260482 | Srinivasa | Ramanuja | 17.29 | Math | A | Analytics |
| 161616 | Marie | Curie | 88 | Chemistry | B | Analytics |
| 271828 | Vikram | Sarabhai | 19.19 | Astronomy | A | MIS |
| 314159 | Chien | Wu | 19.12 | Physics | A | Marketing |
| 314159 | Chien | Wu | 100 | Chemistry | B | Marketing |
| 135791 | Albert | Einstein | 75 | Chemistry | A | Accounting |
| 246802 | Homi | Bhabha | 48 | Math | A | Finance |
| 147036 | Marie | Daly | 67 | Math | A | IB |
| 260482 | Srinivasa | Ramanuja | 92.71 | Chemistry | A | Analytics |
| 161616 | Marie | Curie | 88.88 | Astronomy | B | Analytics |
| 271828 | Vikram | Sarabhai | 91.91 | Physics | A | MIS |
| 314159 | Chien | Wu | 91.21 | Math | A | Marketing |

1. ***Show all the records from (all the) table(s) you have created.***

Query:

```
CREATE TABLE Student
 (
   StudID number(6),
   FirstName varchar2(30) NOT NULL,
   LastName varchar2(30),
   Stream CHAR(10),
   CONSTRAINT stream_chk CHECK (Stream IN ('Accounting', 'Finance', 'IB', 'Marketing', 'MIS', 'Analytics')),
   CONSTRAINT stdpk PRIMARY KEY (StudID)
 );


CREATE TABLE Course
 (
   StudID number(6),
   TotalScore decimal(5, 2) not null check (TotalScore >= 0 and TotalScore <= 100),
   CourseName varchar2(30),
   Section CHAR(1),
   CONSTRAINT section_chk CHECK (Section IN ('A', 'B')),
   CONSTRAINT fkstudent
   FOREIGN KEY (StudID)
   REFERENCES Student(StudID)
 );
```

```
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (135791, 'Albert','Einstein','Accounting');
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (246802, 'Homi','Bhabha','Finance');
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (147036, 'Marie','Daly','IB');
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (260482,'Srinivasa','Ramanuja','Analytics');
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (161616,'Marie','Curie','Analytics');
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (271828,'Vikram','Sarabhai','MIS');
INSERT INTO Student (StudID, FirstName,LastName,Stream) VALUES (314159,'Chien','Wu','Marketing');

INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (135791, 99.98,'Physics','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (246802, 99.99,'Physics','B');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (147036,100,'Chemistry','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (260482,17.29,'Math','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (161616,88,'Chemistry','B');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (271828,19.19,'Astronomy','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (314159,19.12,'Physics','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (314159,100,'Chemistry','B');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (135791,75,'Chemistry','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (246802, 48, 'Math','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (147036, 67,'Math','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (260482, 92.71,'Chemistry','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (161616, 88.88,'Astronomy','B');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (271828, 91.91,'Physics','A');
INSERT INTO Course (StudID,TotalScore,CourseName,Section) VALUES (314159, 91.21,'Math','A');
```

```
select * from Student;
select * from Course;
```

Result:

| | STUDID | FIRSTNAME | LASTNAME | STREAM |
|---|---|---|---|---|
| 1 | 135791 | Albert | Einstein | Accounting |
| 2 | 246802 | Homi | Bhabha | Finance |
| 3 | 147036 | Marie | Daly | IB |
| 4 | 260482 | Srinivasa | Ramanuja | Analytics |
| 5 | 161616 | Marie | Curie | Analytics |
| 6 | 271828 | Vikram | Sarabhai | MIS |
| 7 | 314159 | Chien | Wu | Marketing |

| | STUDID | TOTALSCORE | COURSENAME | SECTION |
|---|---|---|---|---|
| 1 | 135791 | 99.98 | Physics | A |
| 2 | 246802 | 99.99 | Physics | B |
| 3 | 147036 | 100 | Chemistry | A |
| 4 | 260482 | 17.29 | Math | A |
| 5 | 161616 | 88 | Chemistry | B |
| 6 | 271828 | 19.19 | Astronomy | A |
| 7 | 314159 | 19.12 | Physics | A |
| 8 | 314159 | 100 | Chemistry | B |
| 9 | 135791 | 75 | Chemistry | A |
| 10 | 246802 | 48 | Math | A |
| 11 | 147036 | 67 | Math | A |
| 12 | 260482 | 92.71 | Chemistry | A |
| 13 | 161616 | 88.88 | Astronomy | B |
| 14 | 271828 | 91.91 | Physics | A |
| 15 | 314159 | 91.21 | Math | A |

2. ***Display only the first and last names, and courses each student is enrolled in.***

Query:

```
select a.FirstName, a.LastName, b.CourseName from Student a join Course b on a.StudID=b.StudID;
```

Result:

| | FIRSTNAME | LASTNAME | COURSENAME |
|---|---|---|---|
| 1 | Albert | Einstein | Physics |
| 2 | Homi | Bhabha | Physics |
| 3 | Marie | Daly | Chemistry |
| 4 | Srinivasa | Ramanuja | Math |
| 5 | Marie | Curie | Chemistry |
| 6 | Vikram | Sarabhai | Astronomy |
| 7 | Chien | Wu | Physics |
| 8 | Chien | Wu | Chemistry |
| 9 | Albert | Einstein | Chemistry |
| 10 | Homi | Bhabha | Math |
| 11 | Marie | Daly | Math |
| 12 | Srinivasa | Ramanuja | Chemistry |
| 13 | Marie | Curie | Astronomy |
| 14 | Vikram | Sarabhai | Physics |
| 15 | Chien | Wu | Math |

3. ***Which students are failing in which classes, where the failing grade is 40%?***

Query:

```
select a.StdFirstName, a.StdLastName, b.CourseName from StudentTable a join CourseTable b on a.StudID=b.StudID where b.TotalScore<40;
```

Result:

| | FIRSTNAME | LASTNAME | COURSENAME |
|---|---|---|---|
| 1 | Srinivasa | Ramanuja | Math |
| 2 | Vikram | Sarabhai | Astronomy |
| 3 | Chien | Wu | Physics |

4. ***Which students from the Analytics stream are failing?***

Query:

```
select a.FirstName, a.LastName, b.CourseName from Student a join Course b on a.StudID=b.StudID where b.TotalScore<40 and a.Stream='Analytics';
```

Result:

| | FIRSTNAME | LASTNAME | COURSENAME |
|---|---|---|---|
| 1 | Srinivasa | Ramanuja | Math |

5. ***Now alter the table(s) by adding a Professor to each class being taught. Right now keep the professor name empty. Show the new table(s).***

Query:

```
ALTER TABLE Course
ADD Professor varchar2(100);

select * from Course;
```

Result:

| | STUDID | TOTALSCORE | COURSENAME | SECTION | PROFESSOR |
|---|---|---|---|---|---|
| 1 | 135791 | 99.98 | Physics | A | (null) |
| 2 | 246802 | 99.99 | Physics | B | (null) |
| 3 | 147036 | 100 | Chemistry | A | (null) |
| 4 | 260482 | 17.29 | Math | A | (null) |
| 5 | 161616 | 88 | Chemistry | B | (null) |
| 6 | 271828 | 19.19 | Astronomy | A | (null) |
| 7 | 314159 | 19.12 | Physics | A | (null) |
| 8 | 314159 | 100 | Chemistry | B | (null) |
| 9 | 135791 | 75 | Chemistry | A | (null) |
| 10 | 246802 | 48 | Math | A | (null) |
| 11 | 147036 | 67 | Math | A | (null) |
| 12 | 260482 | 92.71 | Chemistry | A | (null) |
| 13 | 161616 | 88.88 | Astronomy | B | (null) |
| 14 | 271828 | 91.91 | Physics | A | (null) |
| 15 | 314159 | 91.21 | Math | A | (null) |

6. ***Change the student name 'Marie Curie' to 'Pierre Curie'.***

Query:

```
UPDATE Student
SET FirstName='Pierre'
WHERE FirstName='Marie' and LastName='Curie';

select * from Student;
```

Result:

| | STUDID | FIRSTNAME | LASTNAME | STREAM |
|---|---|---|---|---|
| 1 | 135791 | Albert | Einstein | Accounting |
| 2 | 246802 | Homi | Bhabha | Finance |
| 3 | 147036 | Marie | Daly | IB |
| 4 | 260482 | Srinivasa | Ramanuja | Analytics |
| 5 | 161616 | Pierre | Curie | Analytics |
| 6 | 271828 | Vikram | Sarabhai | MIS |
| 7 | 314159 | Chien | Wu | Marketing |

7. ***Display the full record for those students whose first name contains the regular expression 'ie'. For example, the word lied has the regular expression 'ie', while lai does not.***

Query:

```
select a.StudID, a.FirstName, a.LastName, a.Stream, b.CourseName, b.TotalScore, b.Section from Student a join Course b on a.StudID=b.StudID
WHERE a.FirstName like('%ie%');
```

Result:

| | STUDID | FIRSTNAME | LASTNAME | STREAM | COURSENAME | TOTALSCORE | SECTION |
|---|---|---|---|---|---|---|---|
| 1 | 147036 | Marie | Daly | IB | Chemistry | 100 | A |
| 2 | 161616 | Pierre | Curie | Analytics | Chemistry | 88 | B |
| 3 | 314159 | Chien | Wu | Marketing | Physics | 19.12 | A |
| 4 | 314159 | Chien | Wu | Marketing | Chemistry | 100 | B |
| 5 | 147036 | Marie | Daly | IB | Math | 67 | A |
| 6 | 161616 | Pierre | Curie | Analytics | Astronomy | 88.88 | B |
| 7 | 314159 | Chien | Wu | Marketing | Math | 91.21 | A |

8. ***Find all the students from the Analytics stream whose score is greater than the average of the Analytic stream students.***

Query:

```
select distinct a.studID, a.FirstName, a.LastName from Student a join Course b on a.StudID=b.StudID
WHERE a.stream = 'Analytics' and b.totalscore > (select avg(b.totalscore) from Course b join Student a on a.StudID=B.StudID where a.stream = 'Analytics');
```

Result:

| | STUDID | FIRSTNAME | LASTNAME |
|---|---|---|---|
| 1 | 260482 | Srinivasa | Ramanuja |
| 2 | 161616 | Pierre | Curie |

9. ***Print the information from these columns StudID, StdFirstName, StdLastName, TotalScore, CourseName, Section, Stream sorted on the last name of the students.***

Query:

```
select a.StudID, a.FirstName, a.LastName, a.Stream, b.CourseName, b.TotalScore, b.Section from Student a join Course b on a.StudID=b.StudID
order by a.LastName;
```

Result:

| | STUDID | FIRSTNAME | LASTNAME | STREAM | COURSENAME | TOTALSCORE | SECTION |
|---|---|---|---|---|---|---|---|
| 1 | 246802 | Homi | Bhabha | Finance | Math | 48 | A |
| 2 | 246802 | Homi | Bhabha | Finance | Physics | 99.99 | B |
| 3 | 161616 | Pierre | Curie | Analytics | Chemistry | 88 | B |
| 4 | 161616 | Pierre | Curie | Analytics | Astronomy | 88.88 | B |
| 5 | 147036 | Marie | Daly | IB | Math | 67 | A |
| 6 | 147036 | Marie | Daly | IB | Chemistry | 100 | A |
| 7 | 135791 | Albert | Einstein | Accounting | Physics | 99.98 | A |
| 8 | 135791 | Albert | Einstein | Accounting | Chemistry | 75 | A |
| 9 | 260482 | Srinivasa | Ramanuja | Analytics | Chemistry | 92.71 | A |
| 10 | 260482 | Srinivasa | Ramanuja | Analytics | Math | 17.29 | A |
| 11 | 271828 | Vikram | Sarabhai | MIS | Astronomy | 19.19 | A |
| 12 | 271828 | Vikram | Sarabhai | MIS | Physics | 91.91 | A |
| 13 | 314159 | Chien | Wu | Marketing | Physics | 19.12 | A |
| 14 | 314159 | Chien | Wu | Marketing | Math | 91.21 | A |
| 15 | 314159 | Chien | Wu | Marketing | Chemistry | 100 | B |

10. ***Find the student who received the highest score on each subject (ignore the sections A and B for each subject to find the topper in each subject).***

Query:

```
select x.FirstName, x.LastName, c.studID, c.Coursename, c.highest from
(
select b.studID, b.CourseName, a.Highest
from (select courseName, max(TotalScore) as Highest from Course group by coursename) a
inner join course b on a.highest = b.totalscore
) c
join student x
on x.studid = c.studid;
```

Result:

| | FIRSTNAME | LASTNAME | STUDID | COURSENAME | HIGHEST |
|---|---|---|---|---|---|
| 1 | Chien | Wu | 314159 | Math | 91.21 |
| 2 | Pierre | Curie | 161616 | Astronomy | 88.88 |
| 3 | Marie | Daly | 147036 | Chemistry | 100 |
| 4 | Chien | Wu | 314159 | Chemistry | 100 |
| 5 | Homi | Bhabha | 246802 | Physics | 99.99 |