Department of Computer Science and Engineering

Course Code:CSE370	**Credits: 1.5**
Course Name: Database Systems	

Lab 07
Database Challenge 02

I. Topic Overview:

In this lab, students will be given a new scenario. Given this scenario, Students will have to design a database table and perform some queries on the table. The idea of this lab is to test the Students problem solving skills and basic knowledge of MySQL. The challenge scenario will focus on primary-foreign key constraints, aggregate functions and advanced SQL select queries, such as joins, subqueries, exists etc.

II. Lesson Fit:

Students should have an understanding of the following:

1. SQL syntax
2. Advanced SQL Select queries
3. Join operations, Subqueries and aggregate functions.

III. Learning Outcome:

After this exam, the students will:

a. Strengthen their understanding of advanced SQL queries
b. Learn to formulate advanced SQL queries for novel scenarios.

IV. Anticipated Challenges and Possible Solutions

Students might face problems in understanding how to find the top N results or bottom N results.

Solutions: Teachers will explain the use of “LIMIT” together with sorting.

V. Acceptance and Evaluation

Students are expected to complete all tasks during the class. This lab will be graded. No home assignment is allowed for the lab.

VI. Activity Detail

Hour: 1

Students will be explained the rules of the Challenge and they will setup the MySQL server and confirm that it is working. Teachers will explain the given Scenario to the Students and discuss all new concepts that were not covered in Lab 01- 06.

Hour: 2

Students will get 1 hour to complete the Challenge.

Hour: 3

Lab instructors will check individual Students task and grade them. Lab instructors will then explain the solution of each task focusing on the ones that students found challenging.

Lab 7 Activity List

Suggestions for this Lab:

- Use a **Text editor** such as Note Pad to type and save your program.
- **Copy** and **Paste** your program from the Text editor to the command line. If the program works, save the program. Otherwise, fix the error and save it.
- Save your text file regularly.

Task 1

Create and use the database "DC_Battles".

Task 2

You have three tables in your database: Heroes, Villains and Battles. All three tables are created for you and the necessary data has been inserted. Please copy paste the mysql commands within the dotted line in your mini server window

…….

```
Create table Heroes(
Hero_id varchar(3),
Name Varchar(30),
Location Varchar(10),
Primary key(Hero_id)
);

Create table Villains(
Villain_id  varchar(3),
Name varchar(30),
Location Varchar(10),
Primary key(Villain_id)
);
```

```
Create table Battles(
Battle_id varchar(3),
Hero_id varchar(3),
Villain_id varchar(3),
Battle_Date date,
Hero_points int,
Villain_points int,
Battle_location varchar(10),
Primary key(Battle_id),
Foreign key(Hero_id) references Heroes(Hero_id),
Foreign key(Villain_id) references Villains(Villain_id)
);

Insert into Heroes values
('h01', 'The Flash', 'Central City'),
('h02', 'Batman', 'Gotham'),
('h03', 'Green Arrow', 'Star City'),
('h04', 'Wonder Woman', 'Themyscira'),
('h05', 'Green Lantern', 'Coast City'),
('h06', 'Black Canary', 'Star City');

Insert into Villains values
('v01', 'Reverse Flash', 'Central City'),
('v02', 'Deathstroke', 'Star City'),
('v03', 'Joker', 'Gotham'),
('v04', 'Riddler', 'Gotham'),
('v05', 'Harley Quinn', 'Gotham'),
('v06', 'Ares', 'Mount Olympus');

Insert into Battles values
('b01', 'h01', 'v01', '2017-12-12', 85, 90, 'Central City'),
('b02', 'h01', 'v06', '2016-10-09', 40, 98, 'Metropolis'),
('b03', 'h03', 'v02', '2018-06-11', 90, 93, 'Star City'),
('b04', 'h04', 'v06', '2016-10-10', 99, 98, 'Central City'),
('b05', 'h06', 'v05', '2018-07-08', 92, 85, 'Star City'),
('b06', 'h03', 'v02', '2017-06-11', 90, 88, 'Star City');
```

……

Please check that all data has been inserted correctly in all three tables.

Task 3

Run appropriate queries to retrieve the requested data below [Use a single query for each question]:

a. Retrieve the name and average point of each hero.
b. Retrieve the name of heroes, name of villains, date and location of battle where the heroes have scored lower than the villains.
c. Retrieve the name of the villains who have fought the same hero more than once.
d. Retrieve the name of villains whose locations are not the same as their battle location.
e. Reverse flash cheated in his battle by time travelling. So he will lose 20% of his points. [Hint: Do not directly use Reverse flash's ID, use subquery]
f. Retrieve the name of the hero who achieved the maximum points in all battles.
g. Retrieve the name of the villain who achieved the minimum points in all battles.
h. Retrieve the name of villains who have fought more than 1 battle.
i. Retrieve the name of the heroes who have fought in more than one distinct city.
j. Retrieve the name of the villains who have the top 3 scores.
k. Retrieve the name of the heroes who have the bottom 3 scores.