Homework #2

Notice: Please use only MySQL syntax for this assignment.

Name: Student ID: Assigned Date: 2025-03-27

Submission Instructions:

1. Start your Apache and MySQL.
2. Go to phpMyAdmin homepage and import the hw2_XX_DB.txt we provided on iLearning.
3. Answer the questions below with the corresponding database. (The file name of the database corresponds to the question number.)
4. Organize your answers into a .txt file. Only the first and second questions use the same database. Please clearly mark each question number with comments.
5. Each hw2_XX_DB.txt corresponds to your_answer.txt file. (Please use the question number as your file name.)
6. You must submit four .txt files in total.

Questions:

1. Write the following queries in SQL based on the database schema of a movie database, as shown below:

```
Movies(title, year, length, genre, studioName, producerC#)
StarsIn(movieTitle, movieYear, starName)
MovieStar(name, address, gender, birthdate)
MovieExec(name, address, cert#, netWorth)
Studio(name, address, presC#)
```

Note that the certificate numbers (cert#) of the relation MovieExec is a key consists of integers for all movie executives including producers (producerC#) and studio presidents (presC#).

(a) Who were the male stars in *Jurassic Park*? (7%)
(b) Which stars appeared in movies produced by WD studios in 1999? (7%)
(c) Who is the president of Pixar studios? (7%)
(d) Which movies are longer than *Now You See Me*? (7%)
(e) Which executives are worth more than Steven Spielberg? (7%)

2. Write the following queries in SQL using the database schema of Problem Set 1.

   (a) Find all the stars that appeared either in a movie made in 1993 or a movie with "Hotel" in the title. (6%)
   (b) Find all executives worth at least $900,000. (6%)
   (c) Find all the stars who are female and live in Hill (have string Hill as a part of their address). (6%)

3. Write the following queries in SQL based on the database schema in Homework 1, as shown below:

```
Product(maker, model, type)
PC(model, speed, ram, hd, price)
Laptop(model, speed, ram, hd, screen, price)
Printer(model, color, type, price)
```

   You should use at least one subquery in each of your answers and write each query in two significantly different ways (e.g., using different sets of the operators **EXISTS**, **IN**, **ALL**, and **ANY**).

   (a) Find the printers with the highest price. (7%)
   (b) Find the model number of the item (PC, laptop, or printer) with the lowest price. (7%)
   (c) Find the maker(s) of the Laptop(s) with the fastest processor among all those Laptops that have the largest amount of RAM. (7%)

4. Write the following queries in SQL based on the database schema of Problem Set 3, and evaluate your queries using the sample data in Fig. 1.

   (a) Find the average speed of PC's. (7%)
   (b) Find the average price of all PCs and printers made by manufacturer "E". (7%)

maker	*model*	*type*
A	1001	pc
A	1002	pc
A	1003	pc
A	2004	laptop
A	2005	laptop
A	2006	laptop
B	1004	pc
B	1005	pc
B	1006	pc
B	2007	laptop
C	1007	pc
D	1008	pc
D	1009	pc
D	1010	pc
D	3004	printer
D	3005	printer
E	1011	pc
E	1012	pc
E	1013	pc
E	2001	laptop
E	2002	laptop
E	2003	laptop
E	3001	printer
E	3002	printer
E	3003	printer
F	2008	laptop
F	2009	laptop
G	2010	laptop
H	3006	printer
H	3007	printer

(a) Sample data for Product

model	*speed*	*ram*	*hd*	*price*
1001	2.66	1024	250	2114
1002	2.10	512	250	995
1003	1.42	512	80	478
1004	2.80	1024	250	649
1005	3.20	512	250	630
1006	3.20	1024	320	1049
1007	2.20	1024	200	510
1008	2.20	2048	250	770
1009	2.00	1024	250	650
1010	2.80	2048	300	770
1011	1.86	2048	160	959
1012	2.80	1024	160	649
1013	3.06	512	80	529

(b) Sample data for relation PC

model	*speed*	*ram*	*hd*	*screen*	*price*
2001	2.00	2048	240	20.1	3673
2002	1.73	1024	80	17.0	949
2003	1.80	512	60	15.4	549
2004	2.00	512	60	13.3	1150
2005	2.16	1024	120	17.0	2500
2006	2.00	2048	80	15.4	1700
2007	1.83	1024	120	13.3	1429
2008	1.60	1024	100	15.4	900
2009	1.60	512	80	14.1	680
2010	2.00	2048	160	15.4	2300

(c) Sample data for relation Laptop

model	*color*	*type*	*price*
3001	true	ink-jet	99
3002	false	laser	239
3003	true	laser	899
3004	true	ink-jet	120
3005	false	laser	120
3006	true	ink-jet	100
3007	true	laser	200

(d) Sample data for relation Printer

Figure 1: Sample data for relations of Problem Set 4

5. Write the following database modification in SQL based on the database schema, as shown below:

```
Classes(class, type, country, numGuns, bore, displacement)
Ships(name, class, launched)
Battles(name, date)
Outcomes(ship, battle, result)
```

Describe the effect of the modifications on the data in Fig. 2.

(a) The three battleships (bb) of the Japanese Yamato class — Yamato, Musashi, and Shinano — were launched in 1941, 1942, and 1944, respectively. Each had nine 18-inch guns and a displacement of 72,000 tons. Insert these facts into the database. (6%)

(b) Delete from Ships all ship sunk or damaged in battle. (6%)

class	*type*	*country*	*numGuns*	*bore*	*displacement*
Bismarck	bb	Germany	8	15	42000
Iowa	bb	USA	9	16	46000
Kongo	bc	Japan	8	14	32000
North Carolina	bb	USA	9	16	37000
Renown	bc	Gt. Britain	6	15	32000
Revenge	bb	Gt. Britain	8	15	29000
Tennessee	bb	USA	12	14	32000
Yamato	bb	Japan	9	18	65000

(a) Sample data for relation Classes

name	*date*
Denmark Strait	5/24-27/41
Guadalcanal	11/15/42
North Cape	12/26/43
Surigao Strait	10/25/44

(b) Sample data for relation Battels

name	*class*	*launched*
California	Tennessee	1921
Haruna	Kongo	1915
Hiei	Kongo	1914
Iowa	Iowa	1943
Kirishima	Kongo	1915
Kongo	Kongo	1913
Missouri	Iowa	1944
Musashi	Yamato	1942
New Jersey	Iowa	1943
North Carolina	North Carolina	1941
Ramillies	Revenge	1917
Renown	Renown	1916
Repulse	Renown	1916
Resolution	Revenge	1916
Revenge	Revenge	1916
Royal Oak	Revenge	1916
Royal Sovereign	Revenge	1916
Tennessee	Tennessee	1920
Washington	North Carolina	1941
Wisconsin	Iowa	1944
Yamato	Yamato	1941

(c) Sample data for relation Ships

ship	*battle*	*result*
Arizona	Pearl Harbor	sunk
Bismarck	Denmark Strait	sunk
California	Surigao Strait	ok
Duke of York	North Cape	ok
Fuso	Surigao Strait	sunk
Hood	Denmark Strait	sunk
King George V	Denmark Strait	ok
Kirishima	Guadalcanal	sunk
Prince of Wales	Denmark Strait	damaged
Rodney	Denmark Strait	ok
Scharnhorst	North Cape	sunk
South Dakota	Guadalcanal	damaged
Tennessee	Surigao Strait	ok
Washington	Guadalcanal	ok
West Virginia	Surigao Strait	ok
Yamashiro	Surigao Strait	sunk

(d) Sample data for relation Outcomes

Figure 2: Sample data for relations of Problem Set 5