# Homework #2

Name: Student ID: Assigned Date: 2021-10-19

1. Write the following queries, based on our running movie database example

```
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#)
```

in SQL.

(a) Find all the stars that appeared either in a movie made in 1980 or a movie with "Love" in the title. (6%)
(b) Find all executives worth at least $10,000,000. (6%)
(c) Find all the stars who either are male or live in Malibu (have string Malibu as a part of their address). (6%)

2. Using the database schema of our running movie example

```
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#)
```

Write the following queries in SQL.

(a) Who were the male stars in *Titanic*? (8%)
(b) Which stars appeared in movies produced by MGM in 1995? (8%)
(c) Who is the president of MGM studios? (8%)
(d) Which movies are longer than *Gone With the Wind*? (8%)
(e) Which executives are worth more than Merv Griffin? (8%)

3. Write the following queries, based on the database schema

```
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. (6%)
(b) Find the model number of the item (PC, laptop, or printer) with the highest price. (6%)
(c) Find the market(s) of the PC(s) with the fastest processor among all those PC'S that have the smallest amount of RAM. (6%)

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

(a) Find the average speed of PC's. (6%)
(b) Find the average price of PC's and laptops made by manufacturer "D." (6%)

| *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 |

(a) 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 |

(b) 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 |

(c) Sample data for relation Printer

Figure 4: Sample data for relations of Exercise 4

5. Write the following database modification, based on the database schema as follows:

```
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. 5.

(a) Two of the three battleships of the Italian Vittorio Veneto class — Vittorio Veneto and Italia — were launched in 1940; the third ship of that class, Roma, was launched in 1942. Each had nine 15-inch guns and a displacement of 41,000 tons. Insert these facts into the database. (6%)

(b) Delete from Ships all ship sunk 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

| *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 |

(c) Sample data for relation Outcomes

Figure 5: Sample data for relations of Exercise 5