Lab Assignment 8

1. Create the following schema and insert some tuples in these tables shown below.

   Author (ID, Name, Birth_Year, Death_Year (NULL in case of Author is alive))

   Book (ID, Author_ID, Title, Publish_Year, Publishing_House, Rating))

   Adaptation (Book_ID, Type, Title, Release_Year, Rating)

2. Write SQL command for the following using Join:

   i) Display the title of each book and the name of its author.
   Answer:

```
SELECT title, name
FROM author join book
ON author.id = book.author_id;
```

   ii) Display the name of each author together with the title of the book they wrote and the year in which that book was published (Show only books published after 2005).
   Answer:

```
SELECT name, title, publish_year
FROM author JOIN book
ON author.id = book.author_id
WHERE publish_year > 2005;
```

   iii) For each book, show its title, adaptation title, adaptation year, and publication year. Consider only books with a rating lower than the rating of their corresponding adaptation.
   Answer:

```
SELECT book.title AS book_title, adaptation.title AS adaptation_title, book.publish_year,
adaptation.release_year
FROM book JOIN adaptation
ON book.id = adaptation.book_id
WHERE book.rating < adaptation.rating AND (adaptation.release_year - book.publish_year) <= 4;
```

   iv) Display the title of each book together with its rating. Consider only those books that were published by authors who are still alive. (Use Inner Join).
   Answer:

```
SELECT title, rating FROM author INNER JOIN book
ON author.id = book.author_id
WHERE author.death_year IS null;
```

   v) Display the title of each book along with the name of its author. Show all books, even those without an author. Show all authors, even those who haven't published a book yet. (Use Full JOIN).
   Answer:

```
SELECT title, name
FROM book FULL JOIN author
ON book.author_id = author.id;
```

vi) Generate all possible pairs of book titles and author names. Consider only books whose author's name is 'Chetan Bhagat' (Use Cross JOIN).
Answer:

```
SELECT title, name
FROM book CROSS JOIN author
WHERE author.name = 'Chetan Bhagat';
```

vii) Select each book's title, the name of its publishing house and the title of its adaptation on the type of the adaptation ('Movie'). (Use Right JOIN).
Answer:

```
SELECT book.title, book.publishing_house, adaptation.title, adaptation.type
FROM book RIGHT JOIN adaptation
ON book.id = adaptation.book_id
WHERE adaptation.type = 'movie';
```

viii) Show the title of each book and the name of its author — but only if the author was born in the 20th century. Otherwise, the author's name field should be NULL (Use Left JOIN).
Answer:

```
SELECT book.title, author.name
FROM book LEFT JOIN author
ON book.author_id = author.id AND author.birth_year BETWEEN 1901 AND 2000;
```

3. Consider the following relation and execute the given queries(Aggregate/Group

By/Having):

YEAR	SUBJECT	WINNER	COUNTRY	CATEGORY
1970	Physics	Hannes Alfven	Sweden	Scientist
1970	Physics	Louis Neel	France	Scientist
1970	Chemistry	Luis Federico Leloir	France	Scientist
1970	Physiology	Ulf von Euler	Sweden	Scientist
1970	Physiology	Bernard Katz	Germany	Scientist
1970	Literature	Aleksandr Solzhenitsyn	Russia	Linguist
1970	Economics	Paul Samuelson	USA	Economist
1970	Physiology	Julius Axelrod	USA	Scientist
1971	Physics	Dennis Gabor	Hungary	Scientist
1971	Chemistry	Gerhard Herzberg	Germany	Scientist
1971	Peace	Willy Brandt	Germany	Chancellor
1971	Literature	Pablo Neruda	Chile	Linguist
1971	Economics	Simon Kuznets	Russia	Economist
1978	Peace	Anwar al-Sadat	Egypt	President
1978	Peace	Menachem Begin	Israel	Prime Minister
1987	Chemistry	Donald J. Cram	USA	Scientist
1987	Chemistry	Jean-Marie Lehn	France	Scientist
1987	Physiology	Susumu Tonegawa	Japan	Scientist
1994	Economics	Reinhard Selten	Germany	Economist
1994	Peace	Yitzhak Rabin	Israel	Prime Minister
1987	Physics	Johannes Georg Bednorz	Germany	Scientist
1987	Literature	Joseph Brodsky	Russia	Linguist
1987	Economics	Robert Solow	USA	Economist
1994	Literature	Kenzaburo Oe	Japan	Linguist

i) Show the total number of prizes awarded.
Answer:

```
SELECT COUNT(winner)
FROM nobel;
```

ii) List each subject - just once
Answer:

```
SELECT DISTINCT subject FROM nobel;
```

iii) Show the total number of prizes awarded for Physics
Answer:

```
SELECT COUNT(*)
FROM nobel
WHERE subject='Physics';
```

iv) For each subject show the subject and the number of prizes.
Answer:

```
SELECT subject, COUNT(*)
FROM nobel
GROUP BY subject;
```

v) For each subject show the first year that the prize was awarded.
Answer:

```
SELECT subject,MIN(yr)
FROM nobel
GROUP BY subject;
```

vi) For each subject show the number of prizes awarded in the year 2000.
Answer:

```
SELECT subject, COUNT(winner)
FROM nobel
WHERE yr=2000
GROUP BY subject;
```

vii) Show the number of different winners for each subject.
Answer:

```
SELECT DISTINCT subject, COUNT(DISTINCT winner)
FROM nobel
GROUP BY subject;
```

viii) For each subject show how many years have had prizes awarded.
Answer:

```
SELECT subject, COUNT(DISTINCT yr)
FROM nobel
GROUP BY subject;
```

ix) Show the years in which three prizes were given for Physics.
Answer:

```
SELECT yr
FROM nobel
WHERE subject='Physics'
GROUP BY yr
HAVING COUNT(yr)=3;
```

x) Show winners who have won more than once.
Answer:

```
SELECT winner
FROM nobel
GROUP BY winner
HAVING COUNT(winner)>1;
```

xi) Show winners who have won more than one subject.
Answer:

```
SELECT winner
FROM nobel
GROUP BY winner
HAVING COUNT(DISTINCT subject) > 1;
```

xii) Show the year and subject where 3 prizes were given. Show only years 2000 onwards.
Answer:

```
SELECT yr, subject
FROM nobel
WHERE yr >= 2000
GROUP BY yr, subject
HAVING COUNT(DISTINCT winner)=3;
```