Q.1 [70 pts, 7 pts each] Consider the following relational schema:

- **Movie** (Title, Year, Rating)
- **Actor** (SSN, Name, Byear, Phone)
- **Acts** (SSN, Title, Role)
- **Schedule** (Theater, Title, City)

Give Relational Algebra expressions for the queries given below:

(a) Find the theaters showing the movies with a rating higher than 8.0.

**Answer:**

(b) List of names of the actors who have appeared in the movies of last year which has a rating higher than 7.5.

**Answer:**

(e) List of names of the actors who are older than 70 and have appeared in the movies with a rating higher than 8.5.

**Answer:**

(d) List of names of the actors who are younger than 30 or have appeared in the movies with a rating lower than 5.0.

**Answer:**
(e) Find the theaters showing some movies of Jack Nicholson.

Answer:

(f) Find the theaters showing all the movies of Marlon Brando.

Answer:

(g) Find the theaters not showing the movies of Clint Eastwood.

Answer:

(h) Find the theaters showing only the movies of this year.

Answer:

(i) Find the theaters in New York showing more than one movies.

Answer:

(j) Find the movie of this year with the highest rating.

Answer:
Q.2 [30 pts, 6 pts each] Consider the following relational schema:

book (b-id, title, author, category, bstore-name)
customer (c-id, c-name, address)
buy (c-id, b-id, date)  date field is in the form “dd/mm/yyyy”
bookstore (name, city, phone)

Give Relational Algebra expressions for the queries given below:

(a) Find the title and category of the books located in the bookstores of Chicago.

Answer:

(b) Find the name and address of the customers who bought a book of Stephen King since the beginning of last year.

Answer:

(c) Find the name of the customers who bought a book from the “Central Bookstore” in Los Angeles in the first day of this year.

Answer:

(d) Find the id and name of the customers who did not buy any book of “Novel” category.

Answer:

(e) Find the name and the city of the bookstores that carry books from all the categories.

Answer: