

Consider the following Movie database for all the questions; for simplicity assume that the title of a movie is unique. The length of the movie is its running time in minutes, and networth of the studio is its monetary value in dollars. Foreign keys are studioName, actorSSN, and movieTitle.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Movie** | | | |  | |  |  |
| Title | Year | Length | StudioName | | ProductionCost | | |
| Star Wars | 2005 | 130 | Fox | | 750000 | | |
| Addams Family | 1982 | 108 | Paramount | | 155000 | | |
| Wayne’s World | 1992 | 95 | Paramount | | 72000 | | |
| Mighty Ducks | 2012 | NULL | Disney | | NULL | | |

|  |  |
| --- | --- |
| **StarsIn** | |
| ActorSSN | MovieTitle |
| 1 | Star Wars |
| 1 | Wayne’s World |
| 2 | Addams Family |
| 2 | Wayne’s World |
| 3 | Star Wars |
| 3 | Addams Family |
| 3 | Wayne’s World |
| 4 | Addams Family |

|  |  |  |  |
| --- | --- | --- | --- |
| **Actor** | |  |  |
| SSN | Name | Gender | Address |
| 1 | Carrier Fisher | F | 123 Maple, Hollywood |
| 2 | Mark Hamil | M | 456 Oak Rd., Brentwood |
| 3 | Harrison Ford | M | 789 Palm, Beverly Hills |
| 4 | Julia Ann | F | 45 Maple, Hollywood |
| 5 | Robert Hook | M | 92 Palm, Beverly Hills |

|  |  |  |
| --- | --- | --- |
| **Studio** | |  |
| Name | Address | Networth |
| Fox | Hollywood | 9000000 |
| Warner Brothers | Hollywood | 500000 |
| Disney | Buena Vista | 7500000 |
| Paramount | Hollywood | 9200000 |

**Question 1** *(10 points)*

Consider the above database schema; Write the following queries in SQL:

1. List the number of movies produced by each studio, consider only the studio that have networth at least 1million US dollars and produced at least 10 movies.
2. Find the male actors who work on all the movies produced by ‘Disney’ studio in year 2000.

**Question 2** *(10 points)*

Given the above relational state, write the result of the following relational algebra expressions. Also show the result of intermediate relations:

**a)** M1 ←πMovieTitle (StarsIn)

S1 ←πStudioName (M1 MovieTitle=title Movie)

RESULT←S1 − πName (Studio)

**b)** RESULT←πName, Title (Movie Title=MovieTitle (σGender=M (Actor ssn=actorSsn StarsIn ))

**Question 3** *(10 points)*

Suppose each of the following update operations are applied directly to the database state shown above and all these operations are independent from each other. Assume for all foreign key columns, applicable referential action for ON DELETE and ON UPDATE is CASCADE. Tell if the operation would be done successfully (i.e. acceptable) or not. Explain your answer briefly. Also state all the integrity constraints violated by each operation, if any.

**a)** INSERT INTO movie VALUES (’Harry Potter’, 2001, 90, NULL, 115500000).

Accept ⭘ **Explain:**

Reject ⭘

**b)** UPDATE starsIn SET actorSSN=5 WHERE movieTitle=’Addams Family’.

Accept ⭘ **Explain:**

Reject ⭘

**c)** UPDATE movie SET studioName=’Van Beuren’ WHERE Title=’Mighty Ducks’.

Accept ⭘ **Explain:**

Reject ⭘

**d)** DELETE FROM studio WHERE name=’Paramount’.

Accept ⭘ **Explain:**

Reject ⭘

**e)** DELETE FROM starsIn WHERE movieTitle=’Star Wars’.

Accept ⭘ **Explain:**

Reject ⭘