

## Identify Repeating Group

**Movie & Actor** (title no  
**title**  
**director no**  
**director forename**  
**director surname**  
**year of release**  
**certificate**  
**video rating**  
**actor no**  
**actor forename**  
**actor surname**  
**sex**  
**dob**  
**nationality**  
**role**)

} **Repeating Group**

## 1NF

**Movie** (title no  
**title**  
**director no**  
**director forename**  
**director surname**  
**year of release**  
**certificate**  
**video rating**)

**Actor** (actor no  
**actor forename**  
**actor surname**  
**sex**  
**dob**  
**nationality**  
**role**  
title no)\*

| Actor no | Actor forename | Actor surname | sex | dob     | nationality | role                     | title no |
|----------|----------------|---------------|-----|---------|-------------|--------------------------|----------|
| 78       | Peter          | Sellers       | M   | 1/12/35 | USA         | Dr Strangelove           | 17277    |
| 2        | Diane          | Keaton        | F   | 5/1/46  | USA         | Annie Hall               | 17277    |
| 28       | Robert         | De Niro       | M   | 17/8/43 | USA         | Jake La Motta            | 13480    |
| 78       | Peter          | Sellers       | M   | 1/12/35 | USA         | President Merkin Muffley | 17277    |
| 2        | Diane          | Keaton        | F   | 5/1/46  | USA         | Mary Wilkie              | 10233    |

## For 2NF

**Movie** (title no  
title  
director no  
director forename  
director surname  
year of release  
certificate  
video rating)

**Actor** (actor no  
actor forename  
actor surname  
sex  
dob  
nationality  
role  
title no\*)

| <u>Actor no</u> | Actor forename | Actor surname | sex | dob     | nationality | role          | <u>title no*</u> |
|-----------------|----------------|---------------|-----|---------|-------------|---------------|------------------|
| 1               | Woody          | Allen         | M   | 1/12/35 | USA         | Alvey Singer  | 17277            |
| 2               | Diane          | Keaton        | F   | 5/1/46  | USA         | Annie Hall    | 17277            |
| 28              | Robert         | De Niro       | M   | 17/8/43 | USA         | Jake La Motta | 13480            |
| 2               | Diane          | Keaton        | F   | 5/1/46  | USA         | Mary Wilkie   | 10233            |

## 2NF

**Movie** (title no  
title  
director no  
director forename  
director surname  
year of release  
certificate  
video rating)

**Role** (actor no\*  
role  
title no\*)

**Actor** (actor no  
actor forename  
actor surname  
sex  
dob  
nationality)

## For 3NF

**Movie** (title no  
title  
director no  
director forename  
director surname  
year of release  
certificate  
video rating)

**Role** (actor no\*  
role  
title no\*)

**Actor** (actor no  
actor forename  
actor surname  
sex  
dob  
nationality)

| <u>Title no</u> | title      | director no | Forename | Surname | year of release | cert | video rating |
|-----------------|------------|-------------|----------|---------|-----------------|------|--------------|
| 17277           | Annie Hall | 1           | Woody    | Allen   | 1977            | 15   | 4            |
| 18159           | Ben Hur    | 2           | William  | Wyler   | 1959            | PG   | 2            |
| 10233           | Manhattan  | 1           | Woody    | Allen   | 1979            | 15   | 4            |

## 3NF

**Movie** (title no  
title  
director no\*  
year of release  
certificate  
video rating)

**Role** (actor no\*  
role  
title no\*)

**Actor** (actor no  
actor forename  
actor surname  
sex  
dob  
nationality)

**Director** (director no  
director forename  
director surname)

### 3NF

**Movie** (title no  
title  
director no \*  
year of release  
certificate  
video rating)

**Role** (actor no \*  
role  
title no \*)

**Actor** (actor no  
actor forename  
actor surname  
sex  
dob  
nationality)

**Director** (director no  
director forename  
director surname)

| <u>Title no</u> | title      | director no * | year of release | cert | video rating |
|-----------------|------------|---------------|-----------------|------|--------------|
| 17277           | Annie Hall | 1             | 1977            | 15   | 4            |
| 18159           | Ben Hur    | 2             | 1959            | PG   | 2            |
| 10233           | Manhattan  | 1             | 1979            | 15   | 4            |

### 3NF

**Movie** (title no  
title  
director no \*  
year of release  
certificate \*)

**Role** (actor no \*  
role  
title no \*)

**Certificate**(certificate  
video rating)

**Actor** (actor no  
actor forename  
actor surname  
sex  
dob  
nationality)

**Director** (director no  
director forename  
director surname)

# Relationships

## Actor

| Actor no | Actor forename | Actor surname | sex | dob     | nationality |
|----------|----------------|---------------|-----|---------|-------------|
| 1        | Woody          | Allen         | M   | 1/12/35 | USA         |
| 2        | Diane          | Keaton        | F   | 5/1/46  | USA         |
| 28       | Robert         | De Niro       | M   | 17/8/43 | USA         |

## Role

| Actor no* | Role         | Title no* |
|-----------|--------------|-----------|
| 1         | Alvie Singer | 17277     |
| 2         | Annie Hall   | 17277     |
| 2         | Mary Wilkie  | 19433     |
| 3         | Ben Hur      | 18159     |

## Director

| Director no | Forename | Surname  |
|-------------|----------|----------|
| 1           | Woody    | Allen    |
| 2           | William  | Wyler    |
| 3           | Ridley   | Scott    |
| 4           | Robert   | Zemickis |

## Movie

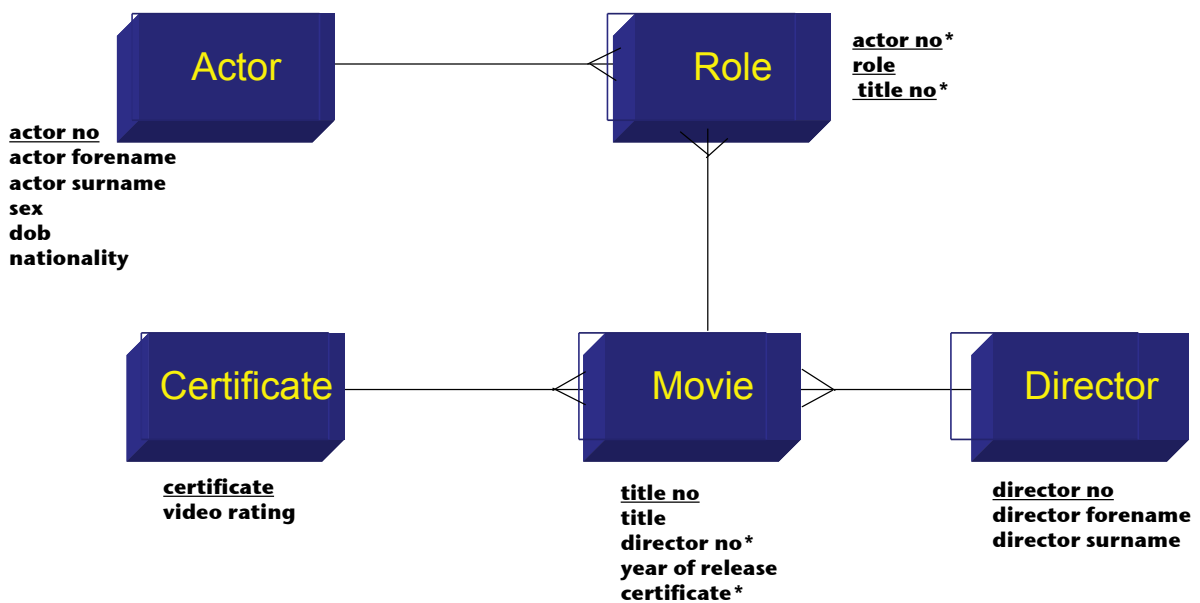
| Title no | title         | director no* | year of release | cert* |
|----------|---------------|--------------|-----------------|-------|
| 17277    | Annie Hall    | 1            | 1977            | 15    |
| 18159    | Ben Hur       | 2            | 1959            | PG    |
| 19433    | Manhattan     | 1            | 1979            | 15    |
| 20494    | The Godfather | 46           | 1971            | 18    |

- 1 actor plays many roles.
- 1 movie contains many roles.
- 1 director directs many movies.
- 1 certificate applies to many movies.

| Certificate | Video rating |
|-------------|--------------|
| 15          | 4            |
| PG          | 2            |

Certificate

## E/R Diagram



## Movie Data Dictionary

| Entity | Attribute       | Key   | Type      | R | U | I | Format     | Validation              |
|--------|-----------------|-------|-----------|---|---|---|------------|-------------------------|
| Actor  | actor no        | PK    | Number    | Y | Y | Y |            | 1 to 10000              |
|        | actor forename  |       | Text (15) | Y | N | N |            |                         |
|        | actor surname   |       | Text (25) | Y | N | N |            |                         |
|        | sex             |       | Text (1)  | Y | N | N | value list | Restricted choice (M,F) |
|        | dob             |       | Date      | Y | N | N | dd/mm/yyyy |                         |
|        | nationality     |       | Text (20) | Y | N | N |            |                         |
| Role   | actor no        | PK/FK | Number    | Y | N | Y | value list | value from actor        |
|        | role            | PK    | Text (30) | Y | N | Y |            |                         |
|        | title no        | PK/FK | Number    | Y | N | Y | value list | value from movie        |
| Movie  | title no        | PK    | Number    | Y | Y | Y |            | 1 to 99999              |
|        | title           |       | Text (50) | Y | N | N |            |                         |
|        | director no     | FK    | Number    | Y | N | Y | value list | value from director     |
|        | year of release |       | Number    | Y | N | N | 9999       | 1900 to 2010            |
|        | certificate     | FK    | Text (2)  | Y | N | Y | value list | value from certificate  |

## Movie Data Dictionary

| Entity      | Attribute         | Key | Type      | R | U | I | Format | Validation |
|-------------|-------------------|-----|-----------|---|---|---|--------|------------|
| Certificate | certificate       | PK  | Text (2)  | Y | Y | Y |        |            |
|             | video rating      |     | Number    | Y | Y | N | 9      | 1 to 99    |
| Director    | director no       | PK  | Number    | Y | Y | Y |        | 1 to 999   |
|             | director forename |     | Text (15) | Y | N | N |        |            |
|             | director surname  |     | Text (25) | Y | N | N |        |            |