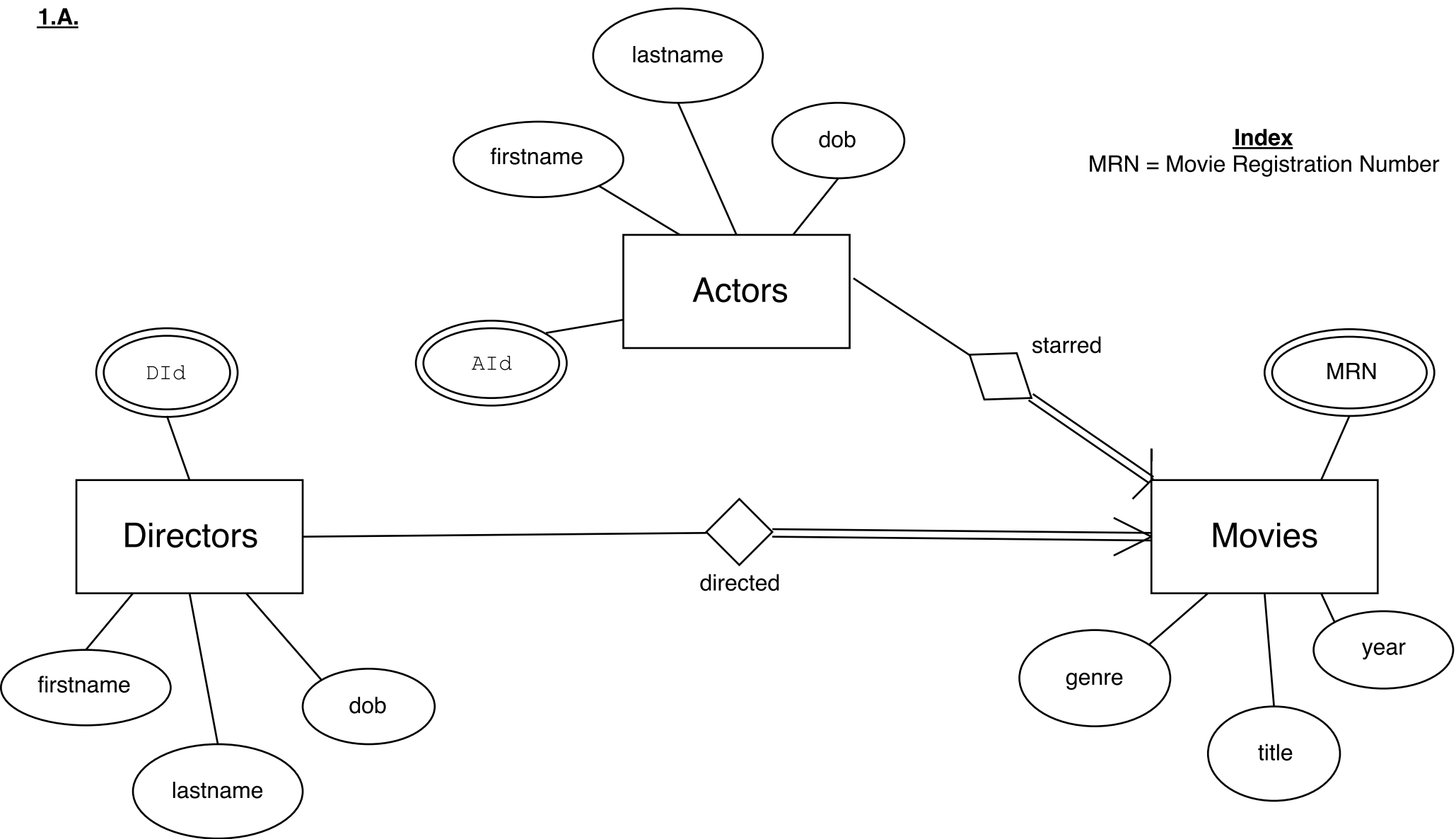


**1.A.**



**E-R Diagram**

1. B.

<u>AId</u>	Firstname	Lastname	dob

Actors Table

Here the Primary key is AId attribute

<u>DId</u>	Firstname	Lastname	dob

Directors Table

Here the Primary key is DId attribute

<u>MRN</u>	Title	Year	Genre

Movies Table

Here the Primary key is MRN attribute

<u>AId</u>	<u>MRN</u>

Starred Relationship Table

Here the Primary key is (AId,MRN) set of attributes

<u>DId</u>	<u>MRN</u>

Directed Relationship Table

Here the Primary key is (DId,MRN) set of attributes

1. C.

i.

$SRK = \Pi_{AId}(\sigma_{firstname = \text{"Shahrukh"}, lastname = \text{"Khan"}}(Actors))$

Ans. =  $\Pi_{title, year}(\sigma_{AId = SRK}(Starred \blacktriangleright \blacktriangleleft Movies))$

ii.

SRK in part (i) is the AId of Actor "Shahrukh" "Khan"

$DSRK = \Pi_{DId}(\sigma_{firstname = \text{"Shahrukh"}, lastname = \text{"Khan"}}(Directors))$

is the DId of Director "Shahrukh Khan"

Ans. =  $(\Pi_{title, year}(\sigma_{AId = SRK}(Starred \blacktriangleright \blacktriangleleft Movies))) \cap (\Pi_{title, year}(\sigma_{DId = DSRK}(Directed \blacktriangleright \blacktriangleleft Movies)))$

DSRK(Directed ► ◄ Movies)))

iii.

Ans. =  $\sigma_{\text{genre}=\text{"thriller"}, \text{year}>2000}(\Pi_{\text{title, year, genre}}(\sigma_{\text{AId}=\text{SRK}}(\text{Starred} \blacktriangleright \blacktriangleleft \text{Movies})))$

iv.

SRK\_movies =  $\Pi_{\text{MRN}}(\sigma_{\text{AId}=\text{SRK}}(\text{Starred} \blacktriangleright \blacktriangleleft \text{Movies}))$

SRK\_dob =  $\Pi_{\text{dob}}(\sigma_{\text{AId}=\text{SRK}}(\text{Actors}))$

Ans. =  $\Pi_{\text{firstname, lastname}}(\sigma_{\text{MRN} \in \text{SRK\_movies, AId}=\text{SRK}}(\text{Actors} \blacktriangleright \blacktriangleleft \text{Starred})) \cap \Pi_{\text{firstname, lastname}}(\sigma_{\text{SRK\_dob} - \text{Actors.dob} \geq 10}(\text{Actors}))$

v. ADM (combined table of all relationships)

= (Actors ► ◄ Starred) ► ◄ Movies ► ◄ (Directors ► ◄ Directed)

SADM (Combined Director and Movies Table when Shahrukh Khan was actor)

=  $\sigma_{\text{actors.firstname}=\text{"Shahrukh"}, \text{actors.lastname}=\text{"Khan"}}(\text{ADM})$

DFS (Director Frequency for Shahrukh Khan)

=  $\text{directors.DId, directors.firstname, directors.lastname} \text{Count}_{\text{MRN}}(\text{SADM})$

Ans. =  $\text{Max}_{\text{no of movies}}(\text{DFS})$

1. D.

SQL commands:

>create database seleri;

>use seleri;

>create table actors ( A\_ID INT UNSIGNED NOT NULL,  
->firstname varchar(21), lastname varchar(21), dob DATE);

>create table directors ( D\_ID INT UNSIGNED NOT NULL,  
->firstname varchar(21), lastname varchar(21), dob DATE );

>create table movies ( MRN INT UNSIGNED NOT NULL,

```
->title varchar(30), year INT(4) UNSIGNED, genre varchar(18) );
>create table starred ( A_ID INT UNSIGNED NOT NULL,
->MRN INT UNSIGNED NOT NULL );
>create table directed ( D_ID INT UNSIGNED NOT NULL,
->MRN INT UNSIGNED NOT NULL );
```

```
>show tables;
>describe actors;
```

Field	Type	Null	Key	Default	Extra
A_ID	int(10) unsigned	NO		NULL	
firstname	varchar(21)	YES		NULL	
lastname	varchar(21)	YES		NULL	
dob	date	YES		NULL	

4 rows in set (0.00 sec)

```
>alter table actors add primary key (A_ID);
>alter table directors add primary key (D_ID);
>alter table movies add primary key (MRN);
>alter table starred add primary key (A_ID,MRN);
#setting composite key
>alter table directed add primary key (D_ID,MRN);
```

```
>insert into actors set A_ID=30039, firstname="Shahrukh",
->lastname="Khan", dob="1965-11-02";
> select * from actors;
```

A_ID	firstname	lastname	dob
30039	Shahrukh	Khan	1965-11-02

1 row in set (0.00 sec)

```
>insert into actors set A_ID=10034, firstname="Amitabh",
->lastname="Bachchan", dob="1942-10-11";
```

```

>insert into actors set A_ID=60003, firstname="Esha",
->lastname="Gupta", dob="1985-11-28";

>insert into directors set D_ID=4123, firstname="Rohit",
->lastname="Shetty", dob="1976-11-28";
>insert into directors set D_ID=3123, firstname="Farah",
->lastname="Khan", dob="1980-12-06";
>insert into directors set D_ID=7223, firstname="Shahrukh",
->lastname="Khan", dob="1965-11-02";
>insert into directors set D_ID=3423, firstname="R.",
->lastname="Balki", dob="1955-11-02";
>insert into directors set D_ID=4253, firstname="Prakash",
->lastname="Jha", dob="1961-11-02";

>insert into movies set MRN=129623, title="Om Shanti Om",
->year=2007, genre="comedy";
>insert into movies set MRN=152623, title="Chennai Express",
->year=2013, genre="thriller";
>insert into movies set MRN=212623, title="kalu ram",
->year=2017, genre="comedy";
>insert into movies set MRN=135423, title="Chakravyuh",
->year=2012, genre="war";
>insert into movies set MRN=121423, title="Paa", year=2009,
->genre="drama";

>insert into directed set D_ID=3423, MRN=121423;
>insert into directed set D_ID=3123, MRN=129623;
>insert into directed set D_ID=4253, MRN=135423;
>insert into directed set D_ID=4123, MRN=152623;
>insert into directed set D_ID=7223, MRN=212623;

>insert into starred set A_ID=10034, MRN=121423;
>insert into starred set A_ID=30039, MRN=129623;
>insert into starred set A_ID=30039, MRN=152623;
>insert into starred set A_ID=50307, MRN=129623;

```

>insert into starred set A\_ID=50307, MRN=152623;  
>insert into starred set A\_ID=30039, MRN=212623;  
>insert into starred set A\_ID=60003, MRN=135423;

SQL Queries:

i)

>select title, year from starred, movies where starred.MRN =  
->movies.MRN and starred.A\_ID in ( select A\_ID from actors  
->where actors.firstname="Shahrukh" and  
->actors.lastname="Khan" ); ####execution time: (0.00 sec)

or,

>select title, year from starred natural join movies where A\_ID in  
->( select actors.A\_ID from actors where  
->actors.firstname="Shahrukh" and actors.lastname="Khan" );  
####execution time: (0.01 sec)

ii)

>select title, year from starred, movies where starred.MRN =  
->movies.MRN and starred.A\_ID in (select a.A\_ID from actors as  
->a where a.firstname="Shahrukh" and a.lastname="Khan") and  
->movies.MRN in (select directed.MRN from directed, movies  
->where directed.MRN = movies.MRN and directed.D\_ID in  
->(select directors.D\_ID from directors where  
->directors.firstname="Shahrukh" and  
->directors.lastname="Khan"));

iii)

>select title, year, genre from starred, movies where  
->starred.MRN=movies.MRN and starred.A\_ID in (select a.A\_ID  
->from actors as a where a.firstname="Shahrukh" and  
->a.lastname="Khan") and movies.genre="thriller" and  
->year>2000;

iv)

>select actors.firstname, actors.lastname from actors, starred  
->where actors.A\_ID=starred.A\_ID and starred.MRN in (select

```

->starred.MRN from starred, movies where
->starred.MRN=movies.MRN and starred.A_ID in (select a.A_ID
->from actors as a where a.firstname="Shahrukh" and
->a.lastname="Khan")) and starred.A_ID not in (select a.A_ID
->from actors as a where a.firstname="Shahrukh" and
->a.lastname="Khan") and actors.A_ID in (select b.A_ID from
->actors as a, actors as b where (YEAR(a.dob)-YEAR(b.dob)--
->(DATE_FORMAT(a.dob, '%m%d') < DATE_FORMAT(b.dob,
->'%m%d')) <= -10));

```

v)

```

>select max(dcount), did, df, dl from (select count(movies.MRN)
->as dcount, directors.D_ID as did, directors.firstname as df,
->directors.lastname as dl from actors, starred, directors, directed,
->movies where actors.A_ID = starred.A_ID and directors.D_ID =
->directed.D_ID and starred.MRN = movies.MRN and
->directed.MRN = movies.MRN and actors.firstname =
->"Shahrukh" and actors.lastname = "Khan" group by did) as
->dfrequency;

```