a- Mostrar los actores cuyo nombre sea Brad.

σ first_name ='Brad' actors

actors.id	actors.first_name	actors.last_name	actors.gender
24973	'Brad'	'Baldridge'	'M'
127712	'Brad'	'Dourif'	'M'
376249	'Brad'	'Pitt'	'M'

---

b- Mostrar el nombre y apellido de directores catalogados cono de 'Sci-Fi' (ciencia ficción) con una probabilidad mayor igual a 0.5.

S1 = σ (genre='Sci-Fi'∧ prob ≥ 0.5) directors_genres
π directors.first_name, directors.last_name, directors_genres.prob (S1 ⋈ director_id=directors.id directors)

S1 = π directors_genres.director_id,directors_genres.prob σ (genre='Sci-Fi'∧ prob ≥ 0.5) directors_genres
S2 = ρ id ← director_id S1
π directors.first_name, directors.last_name, directors_genres.prob (S2 ⋈ directors)

directors.first_name	directors.last_name	directors_genres.prob
'James (I)'	'Cameron'	0.5
'Richard (II)'	'Kelly'	0.5

---

c- Mostrar los nombres de las películas filmadas por James(I) Cameron que figuren en la base.

π movies.name (((σ first_name='James (I)' ∧ last_name='Cameron' directors) ⋈ directors.id=movies_directors.director_id movies_directors) ⋈ movies_directors.movie_id=movies.id movies)

movies.name
'Aliens'
'Terminator 2: Judgment Day'

---

d- Mostrar los nombres y apellidos de las actrices que trabajaron en la película 'Judgment at Nuremberg'

S1 = σ name='Judgment at Nuremberg' movies
S2 = roles ⋈ roles.movie_id=movies.id S1
π actors.first_name,actors.last_name (S2 ⋈ roles.actor_id=actors.id σ actors.gender='F' actors)

actors.first_name	actors.last_name
'Sheila'	'Bromley'
'Virginia'	'Christine'
'Marlene'	'Dietrich'

actors.first_name	actors.last_name
'Olga'	'Fabian'
'Bess'	'Flowers'
'Judy (I)'	'Garland'
'Jana'	'Taylor'

---

e – Muestre los actores que trabajaron en todas las películas de Woody Allen de la base.

S1= π movies_directors.movie_id ((σ first_name='Woody' ∧ last_name='Allen' directors) ⋈ directors.id=movies_directors.director_id movies_directors)
S2= π roles.actor_id, movies_directors.movie_id (roles ⋈ movies_directors.movie_id= roles.movie_id S1)
π first_name,last_name ((S2÷S1)⋈ roles.actor_id=actors.id actors)

actors.first_name	actors.last_name
'Woody'	'Allen'
'John'	'Doumanian'
'Charles'	'Levin'
'Diane'	'Keaton'

Cuantas películas de este director hay en la base?

---

f - Directores que abarcaron, al menos, los mismos géneros que Welles (géneros en directores).

GENRE_W = π directors_genres.genre (σ directors.last_name= 'Welles' directors ⋈ directors_genres.director_id=directors.id directors_genres)
TODOS = π directors_genres.director_id,directors_genres.genre directors_genres ÷ GENRE_W
π directors.first_name,directors.last_name (TODOS ⋈ directors_genres.director_id=directors.id directors)

directors.first_name	directors.last_name
'George'	'Cukor'
'Stanley'	'Kubrick'
'Alfred (I)'	'Hitchcock'
'Orson'	'Welles'
'Billy'	'Wilder'
'Fred'	'Zinnemann'

---

g – Actores que filmaron más de una película en algún año a partir de 1999.

S1 = σ movies.year≥1999 π actors.id,movies.year,roles.movie_id (actors ⋈actors.id=roles.actor_id roles ⋈ roles.movie_id=movies.id movies)
K1 = ρ p1(S1)
K2 = ρ p2(S1)
π actors.first_name,actors.last_name ((K1 ⋈ p1.id=p2.id ∧ p1.year=p2.year ∧ p1.movie_id≠p2.movie_id K2)⋈p1.id=actors.id actors)

actors.first_name	actors.last_name
'Ezra'	'Buzzington'
'Michael Shamus'	'Wiles'
'Phil'	'Hawn'

h- Listar las películas del último año.

ρ AA (π year movies - π m.year (ρ m (movies) ⋈ m.year < movies.year movies)) ⋈ AA.year = movies.year movies

AA.year	movies.id	movies.name	movies.year	movies.quality
2005	30959	Batman Begins	2005	1
2005	302329	Sin City	2005	1

i - Películas del director Spielberg en las que actuó Harrison (I) Ford.

S1 = σ directors.last_name = 'Spielberg' directors
S2 = π movies.id,movies.name (S1 ⋈ directors.id=movies_directors.director_id movies_directors ⋈ movies_directors.movie_id=movies.id movies)
S3 = ρ peli S2
S4 = S3 ⋈ peli.id=roles.movie_id roles ⋈ actors.id=roles.actor_id (σ actors.first_name='Harrison (I)' ∧ actors.last_name= 'Ford' actors)
π peli.name,actors.first_name,actors.last_name S4

peli.name	actors.first_name	actors.last_name
'Indiana Jones and the Last Crusade'	'Harrison (I)'	'Ford'
'Raiders of the Lost Ark'	'Harrison (I)'	'Ford'

j - Películas del director Spielberg en las que no actuó Harrison (I) Ford.

S1 = σ directors.last_name = 'Spielberg' directors
S2 = π movies.id,movies.name (S1 ⋈ directors.id=movies_directors.director_id movies_directors ⋈ movies_directors.movie_id=movies.id movies)
S3 = ρ peli S2
S4 = S3 ⋈ peli.id=roles.movie_id roles
S5 = S4 ⋈ actors.id=roles.actor_id (σ actors.first_name='Harrison (I)' ∧ actors.last_name= 'Ford' actors)
S6 = π peli.id S5
S7 = π peli.id S4 - S6
S7 ⋈ peli.id=movies.id movies

peli.id	movies.id	movies.name	movies.year	movies.quality
289109	289109	'Saving Private Ryan'	1998	1
290070	290070	'Schindler s List'	1993	1

k - Películas en las que actuó Harrison (I) Ford que no dirigió Spielberg.

S1 = σ directors.last_name ≠ 'Spielberg' directors
S2 = π movies.id,movies.name, directors.first_name,directors.last_name (S1 ⋈ directors.id=movies_directors.director_id movies_directors ⋈ movies_directors.movie_id=movies.id movies)
S3 = ρ peli S2
S4 = S3 ⋈ peli.id=roles.movie_id roles ⋈ actors.id=roles.actor_id (σ actors.first_name='Harrison (I)' ∧ actors.last_name= 'Ford' actors)
π peli.name,actors.first_name,actors.last_name,peli.first_name,peli.last_name S4

peli.name	actors.first_name	actors.last_name	peli.first_name	peli.last_name
'Apocalypse Now'	'Harrison (I)'	'Ford'	'Francis Ford'	'Coppola'
'Star Wars: Episode V - The Empire Strikes Back'	'Harrison (I)'	'Ford'	'Irvin'	'Kershner'
'Star Wars: Episode VI - Return of the Jedi'	'Harrison (I)'	'Ford'	'Richard'	'Marquand'
'Blade Runner'	'Harrison (I)'	'Ford'	'Ridley'	'Scott'

L – Directores que filmaron películas de más de tres géneros distintos, uno de los cuales sea 'Film-Noir'.

S1=π directors.id,movies_genres.genre (directors ⋈ directors.id=movies_directors.director_id movies_directors ⋈ movies_directors.movie_id=movies_genres.movie_id movies_genres)
K1 = ρ p1(σ movies_genres.genre='Film-Noir' S1)
K2 = ρ p2(S1)
K3 = ρ p3(S1)
π directors.first_name,directors.last_name((σ p1.genre≠p2.genre ∧ p2.genre≠p3.genre ∧ p1.genre≠p3.genre (K1 ⋈ p1.id=p2.id K2 ⋈ p2.id=p3.id K3)) ⋈ p1.id=directors.id directors)

directors.first_name	directors.last_name
'Alfred (I)'	'Hitchcock'
'Billy'	'Wilder'