Q1

NOTED IN README.MD

Q2

TOOK ~2.7 sec with #RHS = 1, #LHS = 1

Since total number of attributes = 10,
possible combinations =

$$10 \times \left({}^{10}C_2 + {}^{10}C_3 + {}^{10}C_4 + \dots {}^{10}C_9 \right) = 10230$$

$$\Rightarrow \text{Total time} \simeq 5257893 \text{ s}$$
$$\simeq 9 \text{ weeks}$$

The number above might be a bit liberal but it proves the point of the pruning approach.

Q3

IN THE INTEREST OF TIME, FOLLOWING FUNCTIONAL DEPENDENCIES WERE WORKED OUT BY HAND. SUBMISSION CONTAINS CODE TO GET THEM COMPUTATIONALLY. THESE FDs WERE VALIDATED AGAINST CODE.

- Movie ID → TYPE
- Movie ID → Avg Rating
- Member ID → Birth Year

- Movie ID, Member ID → Character
- Genre ID → Genre
- Character → Birthyear
- Movie ID → Runtime
- Movie ID → Start Year

THERE ARE A FEW OTHERS TOO BUT THEY ARE TRIVIAL AND SOME FORM OF THE ABOVE.

Q 4, Q5 ON NEXT PAGE

Q 4

THAT DECISION WILL IMPACT IN TWO MAJOR WAYS:

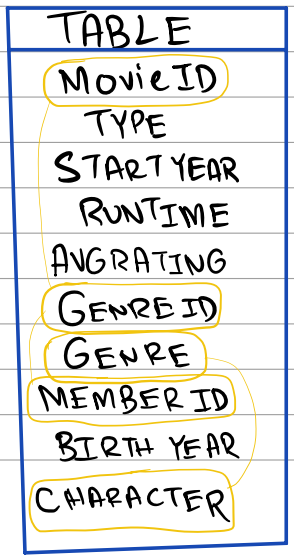
(1) THE FOLLOWING FUNCTIONAL DEPENDENCY WILL NO LONGER BE VALID AS LHS WILL BE POINTING TO MULTIPLE RHS:

MovieID, Member ID → CHARACTER

(2) SINCE A LOT OF ATTRIBUTES WILL NOW BE REPEATING VALUES DUE TO THE ADDITIONAL CHARACTER(S) PLAYED BY THE SAME ACTOR, IN THE SAME MOVIE, IT WILL TAKE LONGER & WOULD POTENTIALLY BE HARDE TO ESTABLISH THE FUNCTIONAL DEPENDENCIES FROM QUESTION 3.

Q5

(CANDIDATE KEYS)



CANDIDATE KEYS / KEY PART

THERE CAN BE 4 CANDIDATE KEYS WITH THE FOLLOWING COMPOSITION:

MOVIE ID , GENREID , MEMBERID

MOVIE ID , GENREID , CHARACTER

MOVIE ID , GENRE , MEMBERID

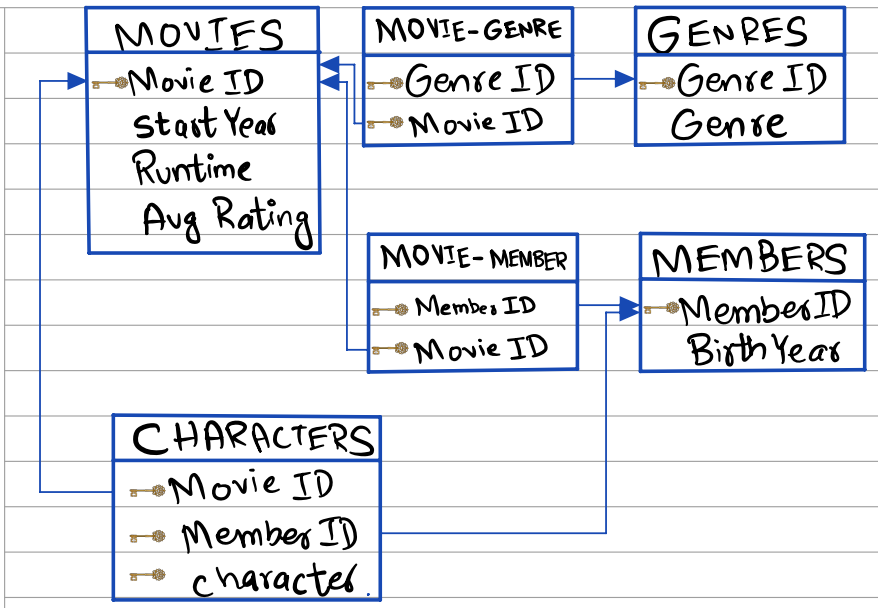
MOVIE ID , GENRE , CHARACTER

#: 1 x 2 x 2 = 4

(CANONICAL COVER)

- Movie ID → Type, StartYear, Runtime, AvgRating,
- Genre ID → Genre
- Member ID → BirthYear
- Member ID, Movie ID → Character

(BCNF)


MOVIES
Movie ID
Start Year
Runtime
Avg Rating
MOVIE-GENRE
Genre ID
Movie ID
GENRES
Genre ID
Genre
MOVIE-MEMBER
Member ID
Movie ID
MEMBERS
Member ID
Birth Year
CHARACTERS
Movie ID
Member ID
character