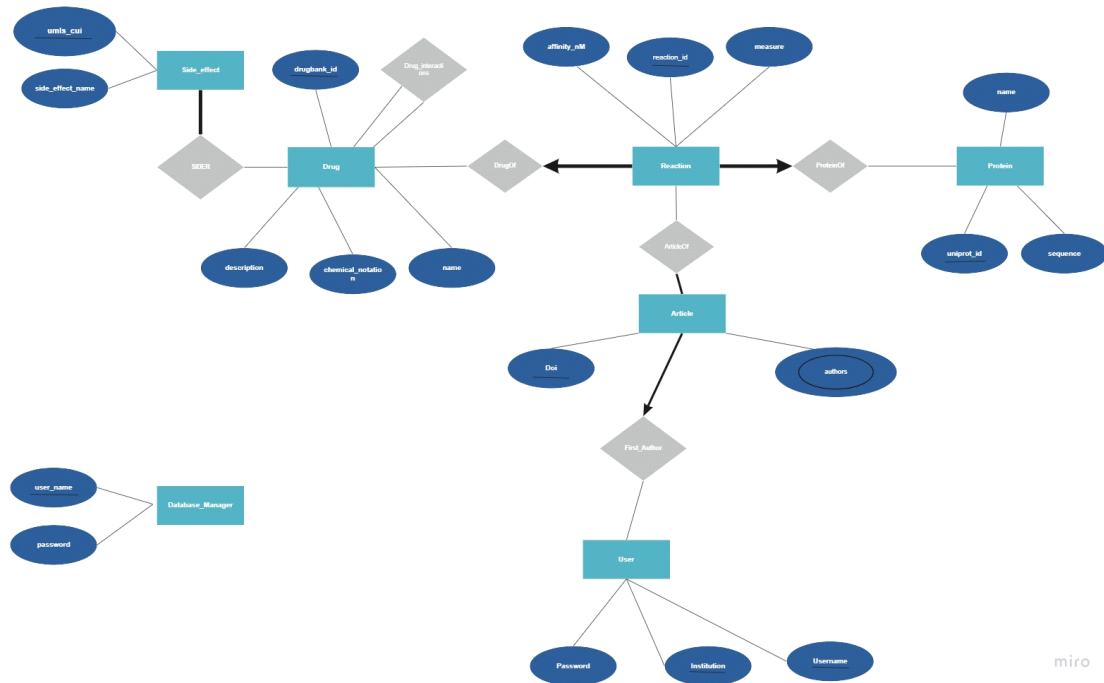
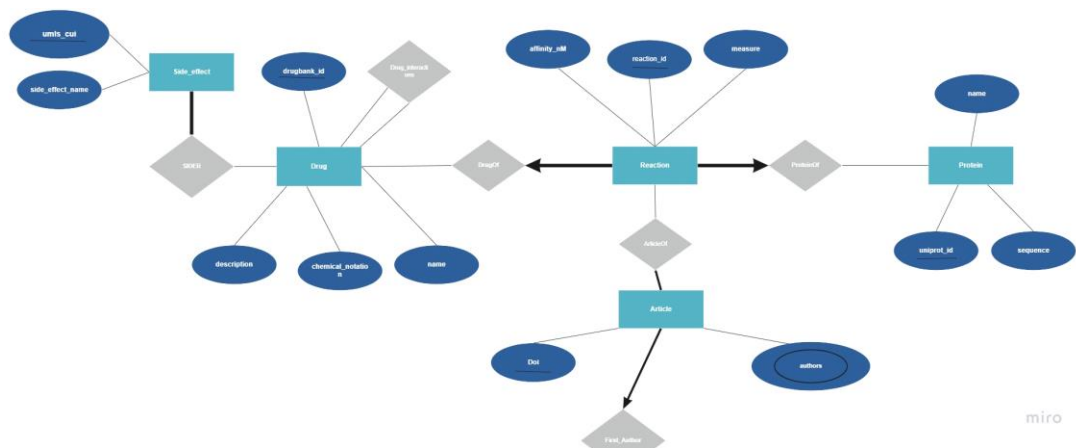


Part 1:

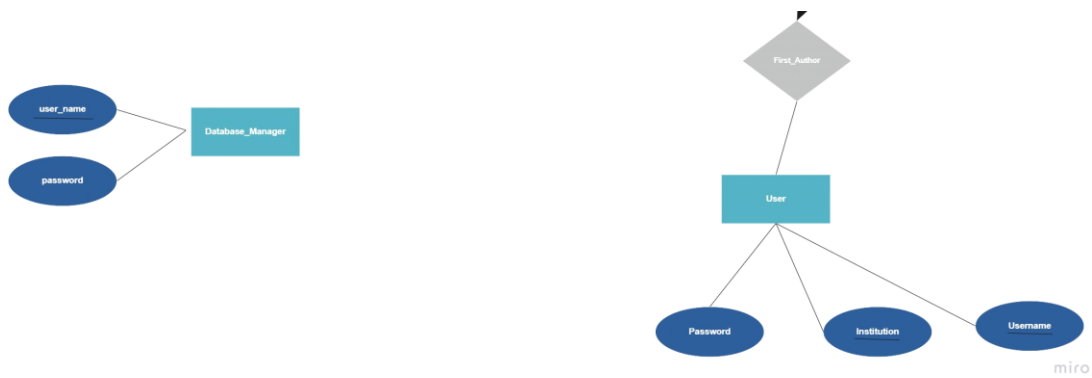


I am dividning above picture to 2 in case you can't display it properly.

Upper part:



Lower part:



And this is the link :

<https://miro.com/welcomeonboard/C6d9QgW8SN8J0QnV4TtlcuHRKV5rM8ZXAn9nRihVqCZUdIZyPpVeU8wsGcAYu4qf>

Part 2:

Side_effect(umls_cui: string, side_effect_name: string)

SIDER(umls_cui: string, drugbank_id: string)

Drug(drugbank_id: string , description: string, name: string, chemical_notation:string)

Drug_interactions(drugbank_id1: string, drugbank_id2: string)

Reaction(reaction_id: int , affinity_nM: float , measure : string)

Protein(uniprot_id: string, name:string, sequence:string)

DrugOf(drugbank_id: string, reaction_id: int)

ProteinOf(uniprot_id: string, reaction_id: int)

ArticleOf(Doi: string, reaction_id : int)

Article(Doi : string)

Authors(Doi :string , authorName:string)

First_Author(Doi : int, Username: string, Institution: string)

User(Username: string, Institution: string, Password: string)

Database_Manager(user_name: string , password : string)

Part 3:

- Side_effect(umls_cui: string, side_effect_name: string)

umls_cui -> name

Since only dependency is that and umls_cui is super key. Then it is already in BCNF.

- Database_Manager(user_name: string , password : string)

user_name -> password

Since only dependency is that and user_name is super key. Then it is already in BCNF.

- User(Username: string, Institution: string, Password: string)

Username,Institution ->Password

Since only dependency is that and Username and Institution are super keys. Then it is already in BCNF.

- Article(Doi : string)

There is only one column then it is already BCNF

- Drug_interactions(drugbank_id1: string, drugbank_id2: string)

drugbank_id1,drugbank_id2 -> drugbank_id1,drugbank_id2

all the columns are super key therefore it is BCNF.

- Reaction(reaction_id: int , affinity_nM: float , measure : string)

reaction_id -> affinity_nM, measure

Since only dependency is that and reaction_id is super key. Then it is already in BCNF.

- ArticleOf(Doi: string, reaction_id : int)

Reaction_id -> Doi

This is the only dependency. Therefore it is BCNF.

- Authors(Doi :string , authorName:string)

Doi , authorName -> Doi,authorName

So all the attributes are super key. Therefore it is already BCNF.

- First_Author(Doi : int, Username: string, Institution: string)

Doi -> Username,Institution.

Important point is that Username does not imply Institution as given in Project description.

Therefore that is the only dependency and it is in BCNF.

- ProteinOf(uniprot_id: string, reaction_id: int)

reaction_id -> uniprot_id

that is the only dependency and it is in BCNF.

- DrugOf(drugbank_id: string, reaction_id: int)

Reaction_id -> drugbank_id

that is the only dependency and it is in BCNF.

- Protein(uniprot_id: string, name:string, sequence:string)

uniprot_id -> name, sequence

name -> uniprot_id, sequence

sequence -> name, uniprot_id

therefore all the columns are super key. Since all LHS is super key, this has BCNF.

- 13) SIDER(umls_cui: string, drugbank_id: integer string)

umls_cui, drugbank_id -> umls_cui, drugbank_id

there is one dependency (trivial) therefore it has BCNF.

- Drug(drugbank_id: string, description: string, name: string, chemical_notation:string)

Obviously, each column determines the others.

drugbank_id -> name, chemical_notation

name -> drugbank_id, chemical_notation

chemical_notation -> name, drugbank_id

therefore all the columns are super key. Since all LHS is super key, this has BCNF.