CSCE 5350-FUNDAMENTALS OF DATABASE SYSTEMS

Assignment-1

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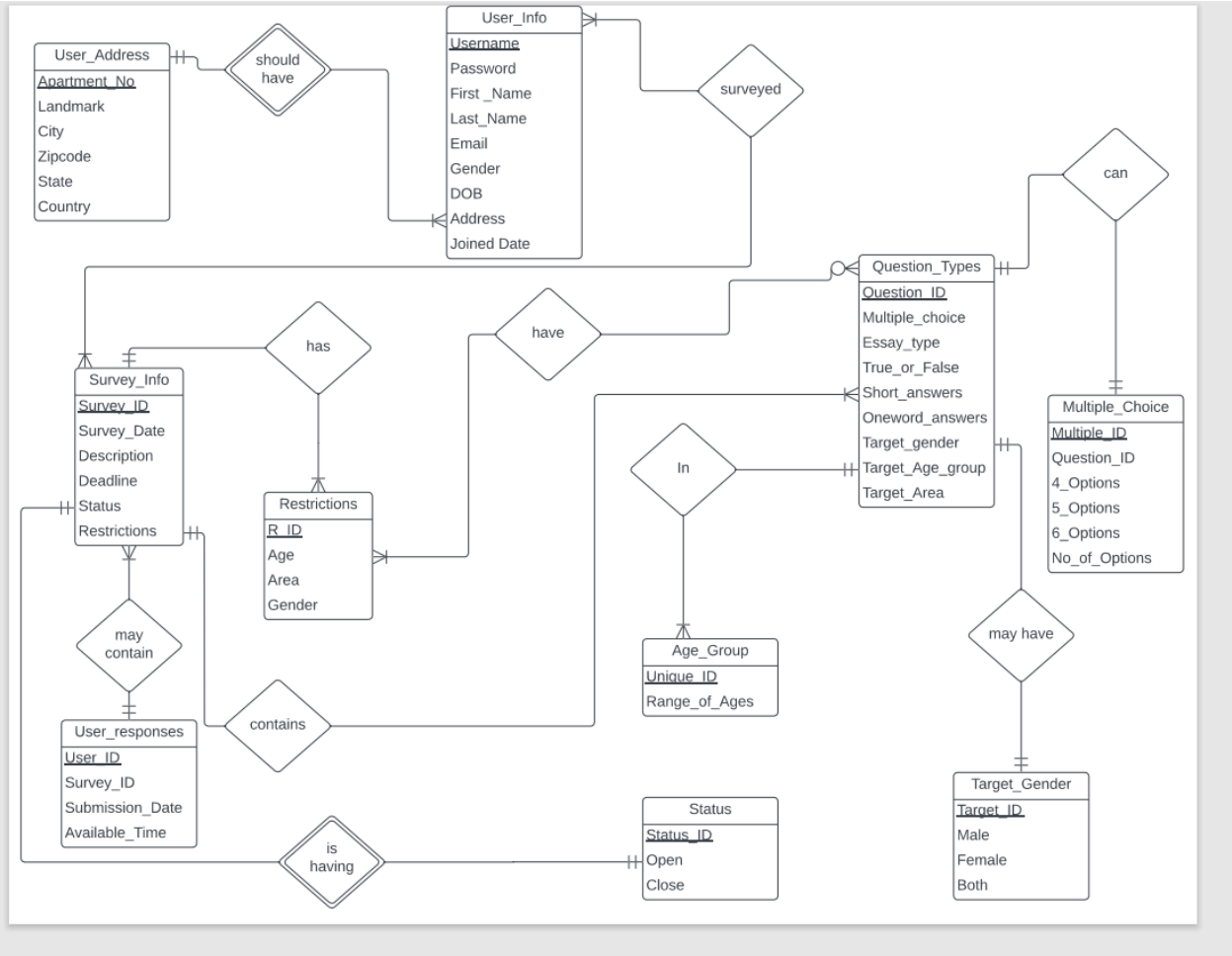
1)Entity Relationship Model:



2a)

i)Relational Schema:

User_Address (Appartment_No,Landmark,City,Zipcode,State,Country)

User_Info (Username, password,First_Name,Last_Name,Email,Gender,DOB,Address,JoinedDate)

Survey_Info (Survey_ID,Survey_Date,Description,Deadline,Status,Restrictions)

Question_Types (Question_ID,Multiple_Choice,Essay_Type,True_or_False,Short_ Answers,

Oneword_Answers, Target_Gender,Target_Age_Group,Target_Area)

Multiple_Choice (Multiple_ID, Question_ID,4_Options,5_Options,6_Options, No_of_options)

Restrictions(R_Id,Age,Area,Gender)

User_responses(User_ID,Survey_ID,Submission_Date,Available_Time)

Target_Gender(Target_ID,Male,Female,Both)

Age_Group(Unique_ID,Range_of_Ages)

Status(Status_ID,Open,Close)

ii)**Cardinality:**

User_Address-User_Info→one to many

User_Info-User_Address→Many to one

User_Info-Survey_Info→Many to Many

Survey_Info-Restrictions→one to Many

Survey_info-User_Responses→Many to One

Survey_Info-Question_Types→One to Many

Survey_Info-Status→One to One

Restrictions-Survey→Many to One

Restrictions-Question_Types→Many to Many

Question_Types-Survey_Info→Many to One

Question_Types-Age_Group→One to Many

Question_Types-Multiple_Choice→One to One

Question_Types-Target_Gender→One to One

iii)Weak Entities:

User_Address

Status

2b) Primary Keys: Primary Keys are columns which are used to identify specific unique values in tables. It can't be NULL. Only the primary key may remain in a table.

User_Address (Appartment_No→Primary Key)

User_Info (Username→Primary Key)

Survey_Info (Survey_ID→Primary Key)

Question_Types(Question_ID→Primary Key)

Multiple_Choice(Multiple_ID→Primary Key)

Restrictions(R_Id→Primary Key)

User_responses(Survey_ID→Primary Key)

Target_Gender(Target_ID→Primary Key)

Age_Group(Unique_ID→Primary Key)

Status(Status_ID→Primary Key)

Foreign Keys: A field in a table that is associated to a Primary Key in another table is known as a foreign key.

User_responses(Survey_ID→Foreign Key)

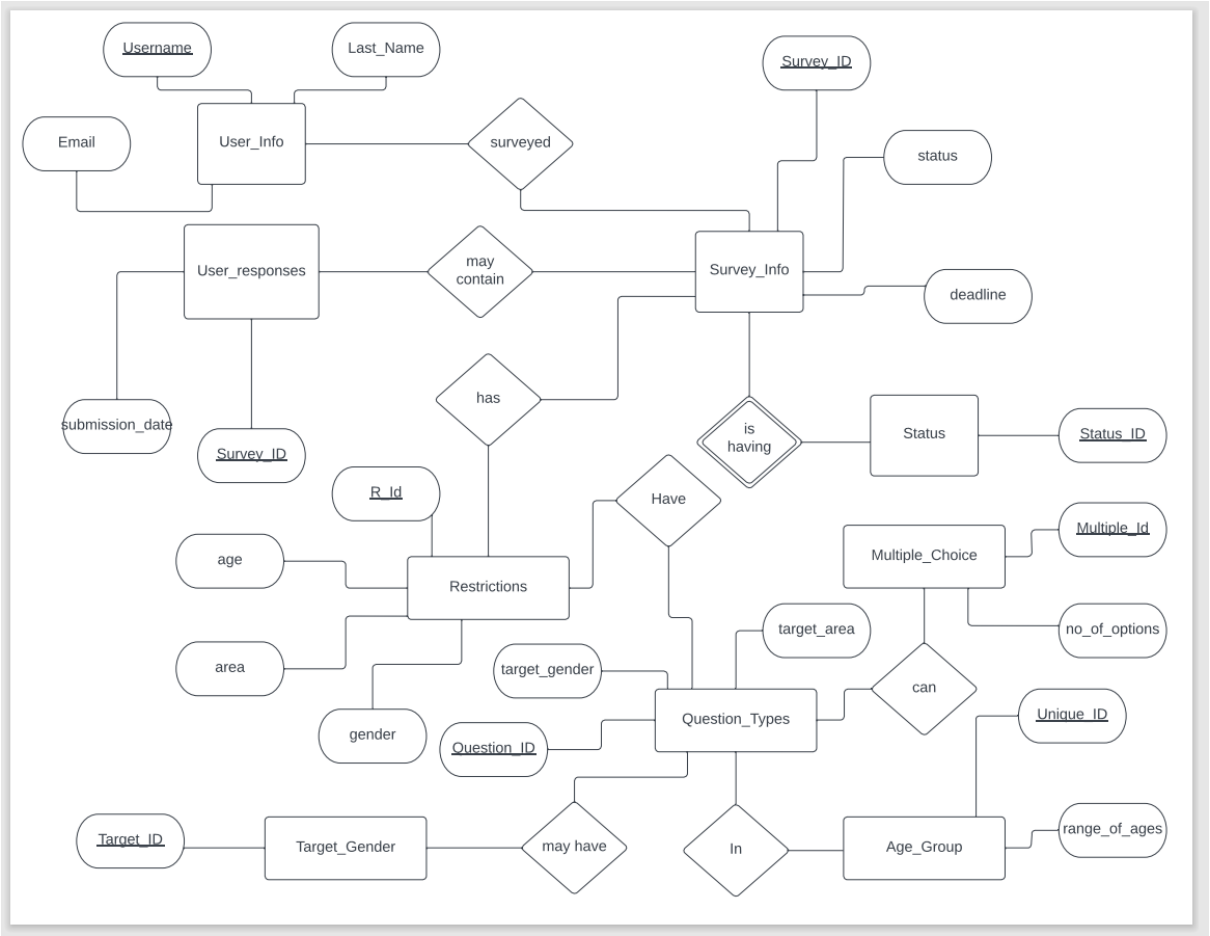
Multiple_choice(Question_ID→Foreign Key)

3)Normalization: Normalization can be defined as it is a process of converting a Database design into Standard format.

a)1NF: It is the first stage of Normalization process. In 1NF each set of columns must uniquely identify a row.

b)2NF: It is the second stage of Normalization process and it fulfill the requirements of 1NF,each non key attribute must be functionally dependent on Primary Key.

c)3NF: The main purpose of 3NF is to fulfill the requirements of 2NF and it has no transitive functional dependency.



4)Relational Algebra Expression:

a) σ multiple_id (πmc.Question_id=qt.Question_id (Multiple_choice(mc) $\times$ Question_types (qt))
and(mc.Question_id="select the option")

b) σ survey_id, description,user_id (π id='1' User_responses(u) $\times$ Survey_info(s))
and (u.survey_id=s.survey_id)

5)SQL Screenshot:

SELECT * FROM INSTRUCTOR;