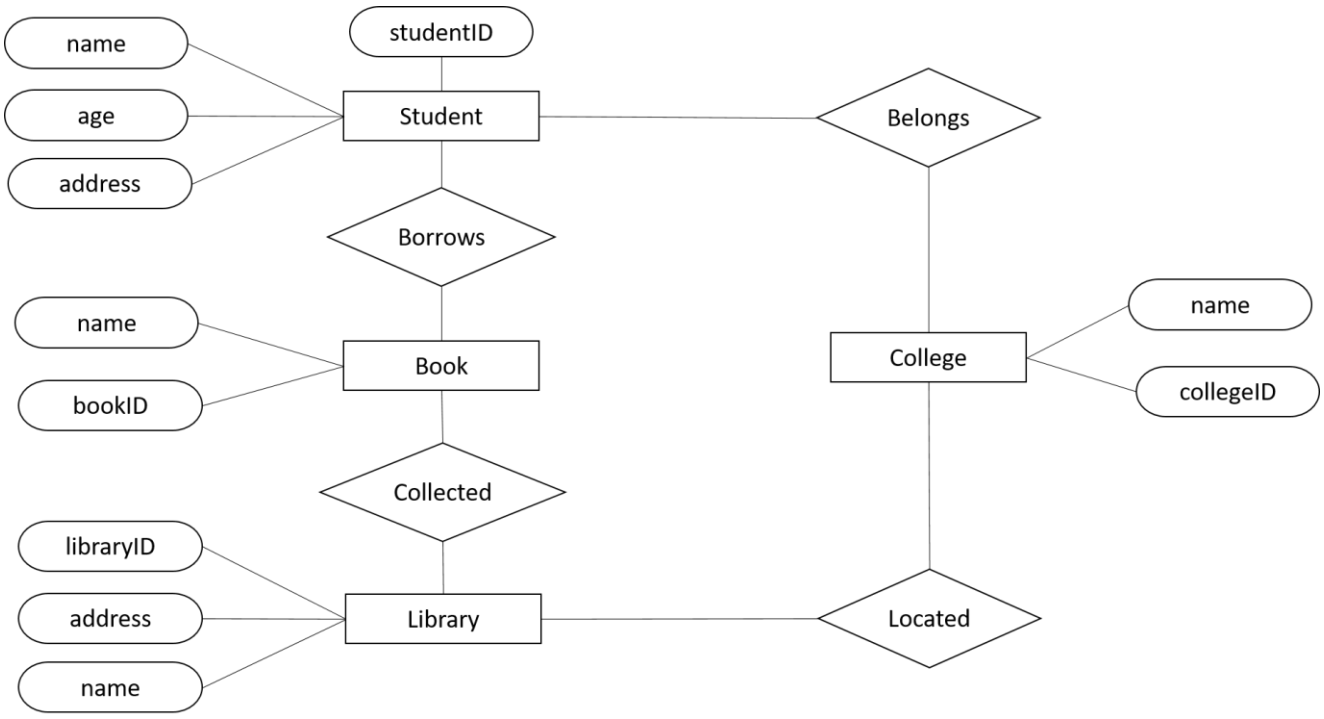
Student Name:_____
Student ID: _____

CSCI3170 Introduction to Database Systems
Assignment 1(Fall 2019)

Please answer all the questions below and hand in your answer to the submission box at the 10/F of SHB ***on or before 10th October 2019 4:00pm***

1. Consider the following ER-diagram and assumptions.



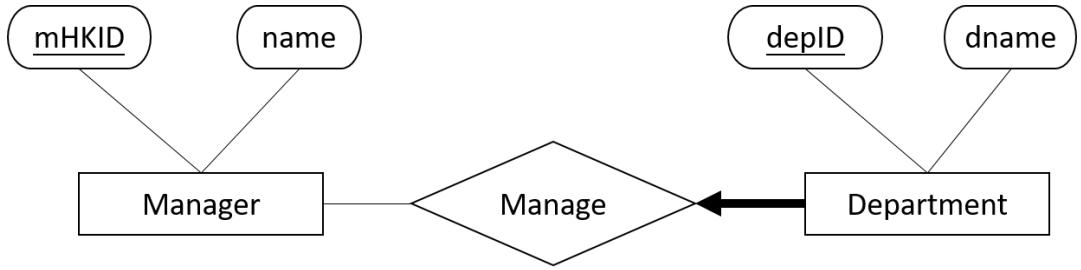
- Every library has a unique libraryID.
- Every student has a unique studentID.
- Every book has a unique bookID.
- Every college has a unique collegeID.
- Every student can be identified by his/her name, age and address together.
- A student is belonged to exactly one college.
- A library collects at least one book.
- A book is collected by exactly one library.
- A library is located at exactly one college.

a) *(5 marks)* List all the superkey(s) of "Student"

b) *(2 marks)* List all candidate key(s) of "Student"

c) *(9 marks)* Assume that studentID is a primary key, complete the ER-diagram by adding all missing constraints (weak entity, key constraints, participation constraints and relationship constraints).

2. Consider the following ER-diagram and relational schemas.

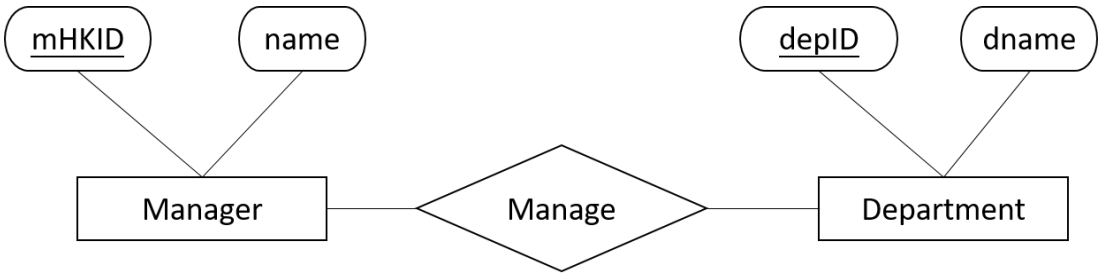


Schema 1
Manager (mHKID, name)
Department (depID, dname)
Manage (mHKID, depID)

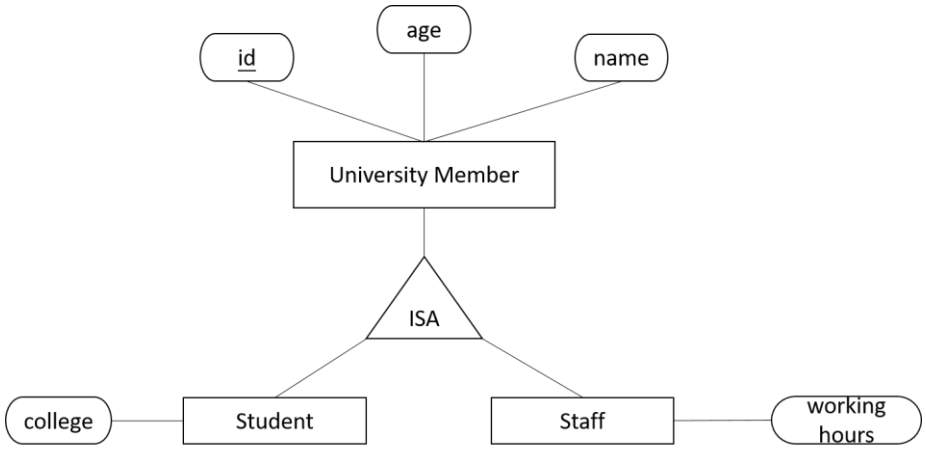
Schema 2
Manager (mHKID, name)
Department (depID, dname, mHKID)

a) *(5 marks)* Explain why schema 2 is more appropriate to represent the ER-diagram.

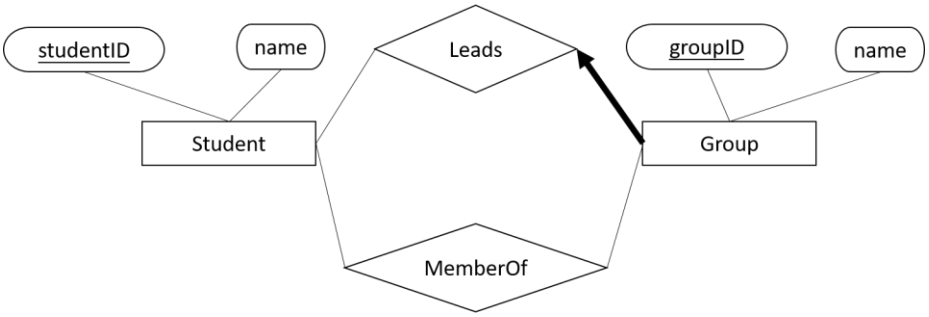
b) *(5 marks)* Which schema is more appropriate if the ER-diagram is modified as follows? Please explain your answer.



3. Translate the following ER-diagrams into relational schemas.
   a) *(6 marks)* Diagram 1



   b) *(6 marks)* Diagram 2



c) *(8 marks)* Diagram 2