# A FD Exercise:

Consider the following relation GO:

GO(GroupId, GroupName, GroupEMail, GroupChairId, GroupChairLName, GroupChairFName, GroupMemberId, GroupMemberMajor)

The relation stores information about student groups, their chair persons and members. Chair persons and members are students with unique student ids (stored as values in GroupChairId and GroupChairLName respectively). GroupId uniquely identifies a group, and a group has a unique name, and an email address (that may not be unique.) For example, three tuples are shown below.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **GroupId** | **GroupName** | **GroupEMail** | **GroupChairId** | **GroupChairLName** | **GroupChairFName** | **GroupMemberId** | **GroupMemberMajor** |
| G1 | Biology | bio@uhcl.edu | 12345 | Lee | Bryan | 23323 | Biol |
| G1 | Biology | bio@uhcl.edu | 12345 | Lee | Bryan | 24990 | Biol |
| G1 | Biology | bio@uhcl.edu | 12345 | Lee | Bryan | 38879 | Phys |

Bryan Lee is the chair student of the group G1 Biology. The three tuples also store information of three members.

(a) List all applicable functional dependencies. (Make reasonable assumptions if necessary.)

(b) What are the candidate keys?

(c) What is the highest normal form? Why?

(d) If the highest normal form is not BCNF, can you decompose the relation TD losslessly into component relations in BCNF while preserving functional dependencies? If yes, how. If no, why?