**Database and file Management Systems** (CIS 2109)

**Lab 9**

**(1) Reference Chapters 5, 6 and 7 in "Modern Database Management"**

**Answer the following questions, using the EER diagram shown here and the corresponding relational schema:**

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ExpenseID references EXPENSE(ExpenseID)

ROOM(BuildinId, RoomNo, RoomCapacity, RoomType)

LAB(*BuildinId, RoomNo*) Ref:ROOM

CLASSROOM(*BuildinId, RoomNo*, BoardType) Ref:ROOM

COMPUTER(CtypeId, ComputerType, TypeDescription, DiskCapacity, ProcessorSpeed)

LABCOMPUTER(*BuildinId, RoomNo, CtypeId*) Ref:COMPUTER and LAB

MEDIA(MtypeId, MediaType, MediaTypeDesc)

ROOMMEDIA(*MtypeId*, *BuildinId, RoomNo*) Ref: ROOM

INSTRUCTOR(EmpId, EmpName, EmpRank, EmpOfficePhone\*)

TRAINED(*EmpId, MtypeId*) Ref: INSTRUCTOR and MEDIA

TIMESLOT(TSId, DayofWeek, StartTime, EndTime)

PREFERS(*EmpId, TSId*) Ref: INSTRUCTOR and TIMESLOT

COURSE(CourseId, CourseDesc, CourseCredits)

PREREQ(*CourseId, PrereqId*) Both Ref: COURSE

SECTION(*CourseId*, SectionId, EnrLimit, Sem, Year, *EmpId*) Ref: COURSE and INSTRUCTOR

SCHEDULE(ScheduleId, *TSId*, *CourseId*, *SectionId, BuildinId, RoomNo*) Ref: ROOM, TIMESLOT and SECTION

**Questions:**

1. In the above relational schema which columns would you create indexes on?
2. In the above relational schema which tables would you partition and how?
3. Do you see any justifiable opportunities for denormalisation?
4. Create the Physical Data Model for the above relational schema. For this purpose you need to create a table with the following information: the table name, column name, description, datatype, primary and foreign key indicators for every single field in the database.

Notice: You don’t really have to do that for all the columns in the relational schema above, just choose 3 tables with at least 10 columns in total and create the physical schema for them.

1. You are given the following query and you are asked to take all the necessary steps to make it faster. What do you do?

SELECT EmpRank, count(\*)

FROM INSTRUCTOR

GROUP BY EmpRank;

1. You are also given the following query and you are asked again to take all the necessary steps to make it faster. What kind of index do you propose?

SELECT EmpName, EmpRank

FROM Artist a

WHERE EmpId = ……. ;

1. You are also given the following query and you are asked again to take all the necessary steps to make it faster. What kind of index do you propose?

SELECT EmpName, EmpRank

FROM ROOM r NATURAL JOIN ROOMMEDIA rm

WHERE MediaType LIKE (P%);

1. What kind of index do you propose for this query?

SELECT \*

FROM TIMESLOT

ORDER BY StartTime **DESC**;

**Part 02**

Now you are ready for the implementation phase. Using the DDL scripts that you created in your previous lab, execute them to create a new set of tables.

**Part 03**

* Now insert at least 1 record in some of the tables that you created in Part 02 (you can make your own records that make sense).
* Create at least 1 index of your choice.
* Drop one of the tables and then recreate the table but this time create a partitioned table (any type of partition that makes sense for your case i.e partition by year, partition by state area (east, northeast, … ), partition by id range,…. )