 **National University**



**of Computer & Emerging Sciences**

**Islamabad**

**Department of Computer Sciences**

**CS1005- Discrete Structures**

**Project Statement**

You are required to design a system in Prolog that will ensure a fair timetable for the student of CS211. You will learn the basics of prolog using the online resources. You may program the project using the environment named SWI-Prolog (https://www.swi-prolog.org/). You will be learning to manage and execute the project using the help provided on the website.

You will be using the following predicates for enforcing the constraints. Each defines a set of courses, their exams, instructors teaching and students following them, as well as a set of rooms and their capacity/availabilities. You will be inserting this information in the system using the data provided herewith to construct the knowledge base. Each specifies the following knowledge:

* A set of students: **student(RollNo,Name)**: A student with unique identifier 'SID' and name 'Name'.
* A set of lecturers: **instructor(emailID,Name)**: A lecturer with unique identifier 'LID' and name 'Name'.
* A set of courses: **course(CID,Title)**: A course with unique identifier 'CID' and name 'Name'.
* A set of section for each course: **coursesection(CID,SecID)**: A course with unique identifier 'CID' andSecID.
* A list of enrollment in CS211 sections: **section(RollNo,SecID)**: A student with RollNumber and SecID for CS211.
* Which instructor teaches which courses: **teaches(emailID,SecID)**: The instructor with 'email' teaches the section with 'SecID'.
* The capacity of rooms: **capacity(RID,Capacity)**: The room with 'RID' can facilitate at most 'Capacity' students.
* The timing of the exam as per given datesheet: exam: **examTime(Date,StartTime,EndTime,CID,RID**)

You will be programming the predicates so that the system will be able to answer the following queries.

1. Give a “Yes” or “No” answer on whether the given student name has two exams in one day.
2. Check if two students given in the query have the same section for a given course name.
3. Check if the two course given in the query have exams at the same time.
4. Check if a student has more than one roll number assigned.
5. Check if the two courses given in the query, have the exam in the same room at the same time.
6. Check if the given instructor is teaching any of the sections of the given course name
7. Check if the given instructor teaches two different courses
8. Check if the exams in the given room can be switched with another given room having same capacity.

Try following the guideline available example [here](https://www-users.york.ac.uk/~sjh1/courses/L334css/swi/swise1.html) to execute your first prolog example

Rubric:

1. Installing correctly SWI prolog (any other Prolog IDE) and executing any prolog project of your choice available online (other than the above example). [20 marks]
2. Successfully Importing all the provided information to knowledge base. [30 marks].
3. Providing correct results for all queries/predicates. [10 marks for each predicate]