**Graph database based timetabling system**

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Section 1:

This is a semester 2 project for Graph Theory module of year 3 Software development course. Aim of this project is to develop a prototype timetabling system for GMIT like the one currently used. As this is a graph theory module the Neo4J database will be used to store the timetable data. Neo4j stores data in nodes connected by relationships so the biggest immediate problem is deciding on what data should go into nodes and what sort of relationships should there be between its units.

Section 2:

Looking at the existing database model that is used here in GMIT. I have decided that main data to stored can be separated into these basic units:

1. Room name/number;
2. Course code/name (this is an equivalent of program section in existing timetable);
3. Subject/module name;
4. Lab group ID;

These 4 units of data can be collected into single node “Timeslot” with properties referencing the nodes. The name given to composite node is intentional as it represents a single slot in timetable filled with data.

Section 3:

Database design should be reflecting types of data to be stored in it. Nodes are named after the 4 stored types of data: Room, Course, Subject, Lab Group. The Timeslot node is a composite node that represents unit of time in the timetable. For the sake of prototype database, I decided to pretend one time slot is equal to 1 hour of time.

Relationship is used to connect the data units to Timeslot node. This relationship is called “Assigned\_to” as it implies the unit is assigned to the timeslot during creation of database timetable.

Types of relationships are usually Many-to-Many. Single room can be assigned to many different timeslots and a single timeslot can have many rooms assigned to it for different courses.

Restrictions when grouping nodes apply however. For example:

* Single room can only be assigned once per timeslot;
* Same Lab Group of single course and subject can’t be grouped with multiple different rooms for single timeslot.

Section 4:

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