Assignment 1 - SENG 271

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Class Diagram

This diagram shows the relationships between the four classes involved in the program.

Student: Used to represent a student, attends rooms at a school.

- **+credit** : int :: The students current credits. This is frequently mutated by rooms they attend.
- **+currentRoom** : String :: The students current room. This is mutated every time they move to a new room.
- **+path** : ArrayList<String> :: The students previous rooms attended. This is added to whenever the student changes rooms.
- **+motivation** : int :: The students current motivation. This is (currently) directly related to credit. In general school.requiredCredit - student.credit = student.motivation.
- **-plans** : ArrayList<ArrayList<String>> :: This contains all possible paths which lead to graduation. *This is only populated if the student plans ahead!*
- **+vacation** : function() :: Whenever the student passes their credit limit or runs out of motivation they are sent on vacation. This resets the student to when they were just admitted to the school.
- **+planAhead** : function() :: The base caller of **explore()**, it sets up the state to prepare for the function. Calling this will populate the student's "plans" attribute.
- **-explore** : function() :: A recursive function which essentially performs a DFS with each route having a "TTL" since they die off when they go over credits allocated.

Room: Used to represent rooms in a given school.

- **+credits** : int :: The number of credits (and thusly motivation) that the course adds to the student's total (as well as removing the same amount of motivation)
- **+connectors** : String[] :: The rooms which this room connects to. In general these are bi-directional.
- **+name** : String :: The name of the room (For the purpose of addressing it in the hash map)
- **+school** : School :: The school which this room belongs to.
- **+attend** : function() :: Mutates the student, adding credit, removing motivation, and mutating their currentRoom and path as neccessary.

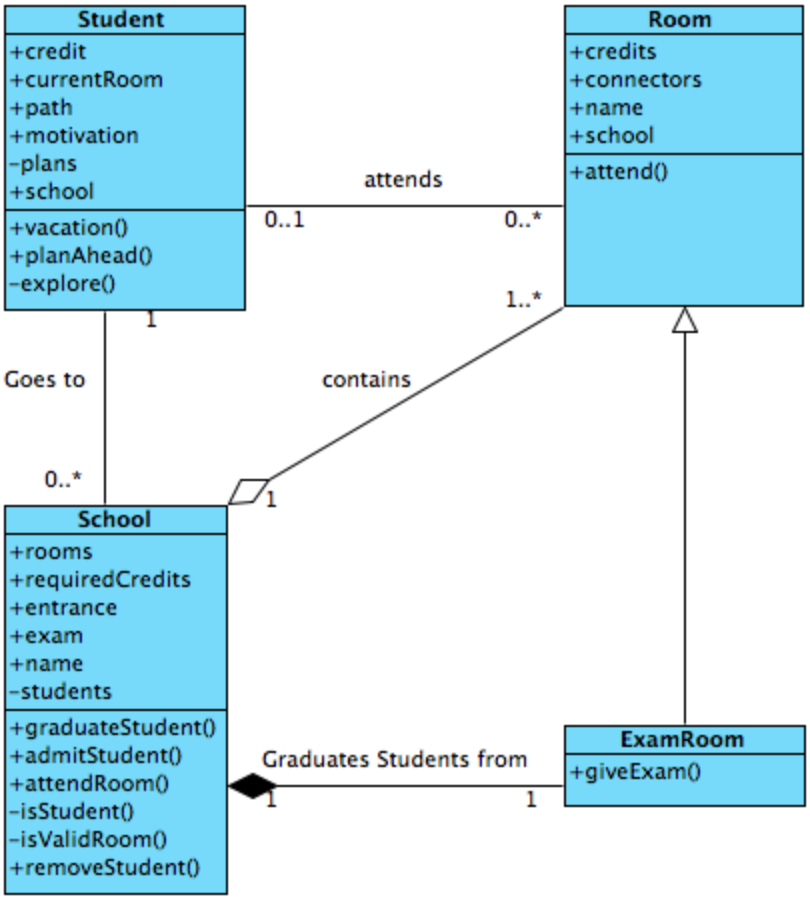
Exam Room: Inherits from Room, has a slightly different attend() method.

- **+attend** : function() :: Graduates or vacations the student as appropriate.

School: The overarching institution. Essentially acts as a control hub. Is able to verify that students are attending, and the rooms are valid.

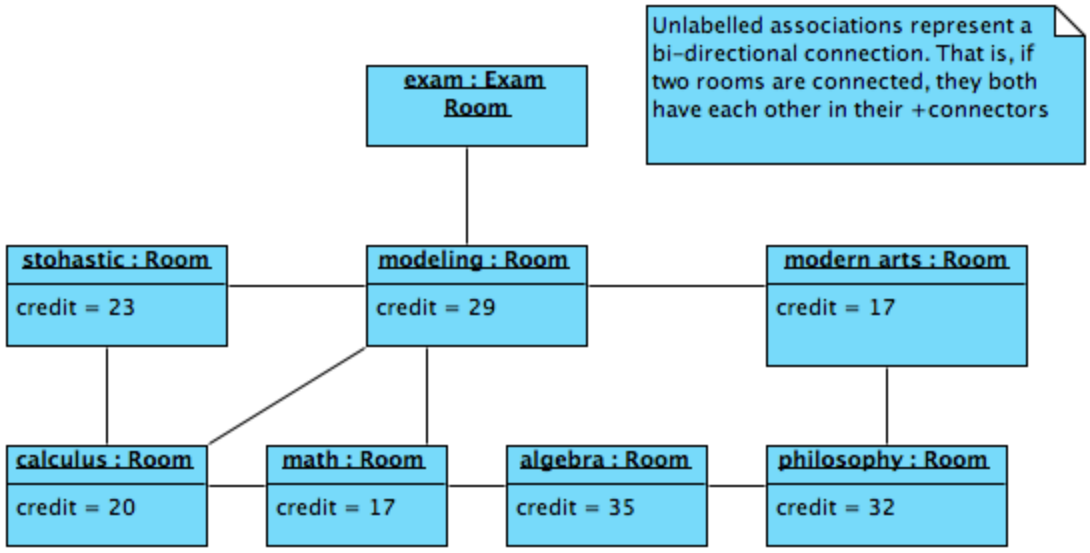
- **+rooms** : Map<String, room> :: A hash map of rooms. This structure was chosen for it's similarity to JSON, which is useful for being able to address using simple strings.
- **+requiredCredits** : int :: The number of credits the school requires to graduate.
- **+entrance** : String :: The entrance of the school. (In the case of Study-Right, this is math)

+exam : String :: The exam room of the school. In case in other schools it is something other than the exam room.
+name : String :: The name of the school.
-students : ArrayList<Student> :: All of the students attending the school at the moment. This can prevent students who are not admitted from joining classes.
+graduateStudent : function() :: Graduates the student and removes them from the school.
+admitStudent : function() :: Sets the student up at the entrance of the school and adds them to the school's roster.
-isStudent : function() :: Determines if the student is a member of that school.
-isValidRoom : function() :: Determines if the room is valid (given the current room)
+removeStudent : function() :: Removes the student from the school.



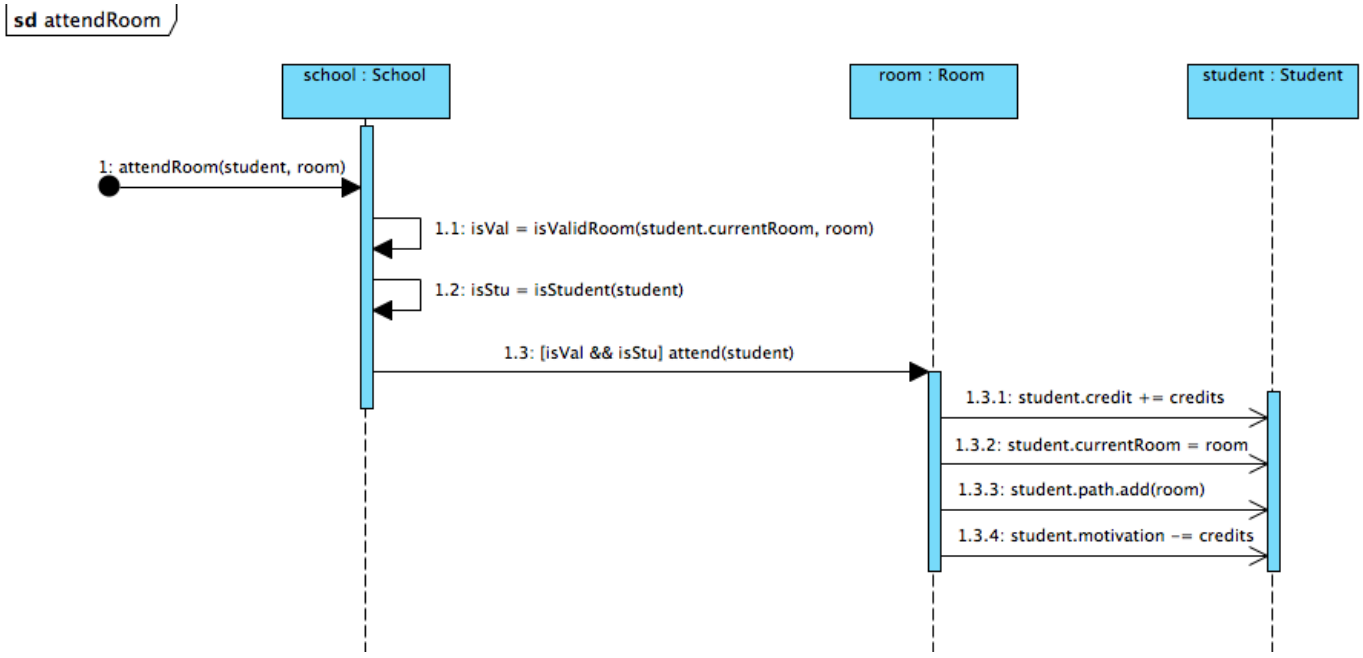
Object Diagram

Displays the links between the various rooms at "Study Right University" as well as their respective credits.



Sequence Diagram 1

This demonstrates the functionality of the attendRoom() function found in the School class. Currently, the function is called from within the main event loop (which prompts the user for their courses etc.)



Sequence Diagram 2

This demonstrates the functionality of the admitStudent() functionality located within the School class this is called when the user agrees that the student should attend study right university.