

Kadir Has University
Department of Computer Engineering
CE 242 - Data Structures and Algorithms
Spring 2010 – Ahmet Ardal
Project Assignment 2

1. Implement the `insertStudent()` method. It should create a new `MultiListNode` of type `STUDENT_NODE` and insert it to the end of the students list using the "right" pointers of `MultiListNode`. Note that all linked lists in `CourseStudentMap` data structure are circular linked lists, so the insertion must be a circular insertion.

Method signature:

```
public void insertStudent(String studentName)
```

2. Implement the `insertCourse()` method. It should create a new `MultiListNode` of type `COURSE_NODE` and insert it to the end of the courses list using the "down" pointers of `MultiListNode`. Note that all linked lists in `CourseStudentMap` data structure are circular linked lists, so the insertion must be a circular insertion.

Method signature:

```
public void insertCourse(String courseName)
```

3. Implement the `insertRelation()` method. It should create a new `MultiListNode` of type `LINK_NODE`. This node should be inserted into two lists. One is the horizontal list following the course node with "nodeName" "courseName", and other is the vertical list following the student node with "nodeName" "studentName". Both insertions must be circular insertions. The method should return the created new node.

Method signature:

```
public MultiListNode insertRelation(String courseName, String studentName)
```

4. Implement the `printCoursesByStudent()` method. It should print all the courses the student with name "studentName" takes.

Method signature:

```
public void printCoursesByStudent(String studentName)
```

5. Implement the `printStudentsByCourse()` method. It should print all the students who take the course with name "courseName".

Method signature:

```
public void printStudentsByCourse(String courseName)
```

6. Implement the `printStudents()` method. It should print all the students in `CourseStudentMap` data structure.

Method signature:

```
public void printStudents()
```

7. Implement the `printCourses()` method. It should print all the courses in `CourseStudentMap` data structure.

Method signature:

```
public void printCourses()
```

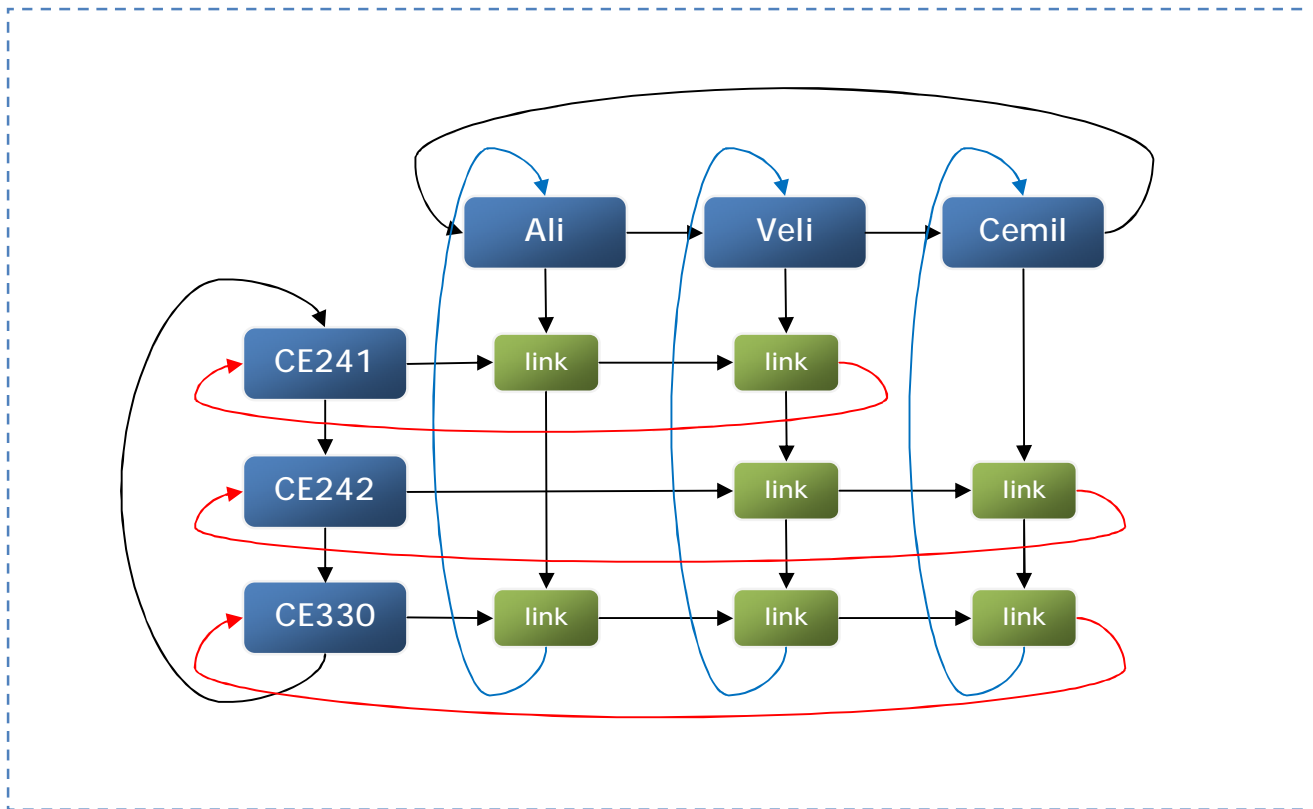


Figure 1 - A sample visualization of CourseStudentMap data structure.

Notes:

- Problem definitions and explanations in this document are not sufficient for you to fully understand and solve the problem. So you are strongly recommended to attend lab classes in order to gain a comprehensive understanding of the problem.
- All of the methods you are asked to implement should be written into the method bodies of the corresponding method definitions in the Java source file named "CourseStudentMap.java".
- All the source code is provided on the Blackboard as a Netbeans project folder. You should download it and work on it.
- After writing your code and making the required modifications, you should compress the project folder as one file (.rar or .zip) and then submit it.