

COL106 Assignment1

Name: Dipen Kumar

Entry Number: 2018CS50098

Group Number: 3

Instructions followed by me:

I have only used java.io.* for this assignment.

I have used all the interface given in question without any changes.

In main method contained in public class Assignment1, I have created three new object of LinkedList class with parameter <Hostel>, <Dept> and <Course> and referred them by allHostels, allDepts and allCourses respectively.

Along with these above mentioned LinkedList, I have created one more object of LinkedList<Student> and referred it by allStudents.

My plan was to fill these LinkedList with the data I will be getting from two input files named "students.txt" and "courses.txt".

I called getData method from main method both in public class Assignment1. I gave it total of 6 arguments. First four were LinkedLists- all Hostel, allDepts, allCourses, allStudents. Last two were two string value contained in arg[0] and arg[1] taken from command line. These two string value were students.txt and courses.txt.

What is getData(allHostels,allDepts,allCourses,allStudents,args[0],args[1]) doing?

It is reading first file i.e. students.txt (I have used FileReader and BufferedReader for this purpose) word by word.

How I achieved word by word reading technique-

I first read the first line by .readLine() and then I broke it in to words separated by " ". I stored these words into a array and used it one by one.

While reading students.txt file- first line contained four words-

Entry_No, Name, Branch, Hostel

I am iterating over allHostels and whenever I find the Hostel same as read from file I put this student in that hostel. For this I create a new object of Student class and initialize its field (name, entryNo, hostel, department) with the value I read from file. And this object I give it to that Hostel to which student belong. As mentioned in question each hostel maintain LinkedList of its students. I also give this new object to allStudents LinkedList. In this way I am maintaing list of all students in a single list.

As mentioned above I was iterating over allHostels. Now the question arises that what if we don't find a Hostel in the List. In this case we will add a new

Hostel to this list. For this I will create a new object of Hostel class and initialize its field name with hostel_name. I will add this object in LinkedList allHostels because allHostels is LinkedList of <Hostel>. Now the same Student object we have in allStudents LinkedList and hostel LinkedList say hostel name is Shivalik. It will be in shivalik LinkedList of <Student> where Shivalik is further in allHostels LinkedList of <Hostel>. Same way I was giving that same Student object to department list of <Student> which in turn was in LinkedList of <Depts> named allDepartments.

In this way I have completed reading students.txt. Now I have allStudents which contain students with name, entryNo, hostel and department.

Next file to read is courses.txt. I again read first line and break it into words- First word of each line is entry_number of student I iterate over allStudents to search this student when I find this it edit it (NOTE: I am editing. I am not creating new object) with the data I get from the file. I create a object of CourseGrade and update it with course_code, course_grade, course_name. I add this CourseGrade object to list of courses taken by that student.

After doing editing I add that object to say COL106 list if the course was COL106. COL106 in turn is in allCourses. If COL106 was not in allCourses then in that case I would have created a new object of <Course> and initialized its name filed by COL106 and then add it to allCourses.

In this way I finishe reading second file i.e. allCourses.txt as well.

I have completed my four LinkedList- allHostels, allDepts, allCourses and allStudents. Note Detail of a student is in an object of class Student and the same object is available to a hostel of allHostels, a department of allDepts, a course of allCourses and allStudents.

How am I answering query file with the help of answerQueries(allHostels,allDepts,allCourses,allStudents,args[2]) method?

This method is taking allHostels, allDepts, allCourses, allStudents and arg[2] as argument. Query.txt is in arg[2]. I am reading file word by word.

If I get INFO as query, I will ask for next word and expect name or entry number of a student. I will iterate over allStudents and find this student. Once I find this student I will store its information to be printed in a string and push that string in to a array A of string. NOTE while store its courses with grade obtained I have to store it in lexicographical order. For that I will store its courses name in a array of string and bubble sort that array. Similarly I move further and again read next word. Suppose that this time I get SHARE as query. I will iterate over allHostels also allDepts also allCourses and if I find that the entity name in these LinkedLists matches the input received from query file as next word then I will iterate over student list of that entity and

store(lexicographical order with help of array and bubble sort mentioned above) their entry number in a string except the one with whom they are sharing the entity. And push back this string in array A of string. Finally If the query type is COURSETITLE I will iterate over allCourses and if I matches the course code of the input received from next word, I will store its course_name in a string and push this string in array A of string. Finally I will println all these strings in array A in reverse order of input.

In class Course implements Entity, I have used a field of type “string” named “form” which stores the course full title of its corresponding course.