**TASK DESCRIPTION**

This is a program is basically a student details program that stores student details like student id and student name in text file. This program allows user to add new student data, search for existing student by student id and also can display all students. New student can be added only if student id follows 6 digits numeric string and does not exist in student details data.

1. To perform this program, two class files are created. One file being student class file having fields’ id and name. Methods like get name (to get the name), set name (to set the name), get id (to get the id), set id (to set the id), to string (displays string representation of student details), is valid (checks if id requirements are matched), id exists (checks if id is unique and does not already exist in student details) etc.
2. Another class called as test student has been created to follow the other requirements of program.
3. All the existing data is collected from text file and stored in array list. And again all the data has been written in text file to create the consistent formatting.
4. Then system displays what user wants to do out of add, search, display and quit options.
5. If user chooses add option then it allows user to add new student details in text file by inputting student id and student name. Student id has to pass is valid and id exist method.
6. If user chooses search option then it allows user to search for particular student by its id.
7. If user chooses display option then details of all the student is displayed.
8. If user chooses quit then programs ends.

**TASK OUTPUT**

|  |  |
| --- | --- |
| **Test Data** | **Screenshot** |
| Choose option 1 to display all students |  |
| Choose options 2 to search student with student id |  |
| Choose option 3 to add new student |  |
| Try to add student with wrong id and then existing id |  |
| Student text file |  |

**TASK CODE**

**Student Class**

**import** java.util.ArrayList;

**public** **class** Student {

// declaring data fields to store student name and student id

String studentName;

String studentId;

// declaring no-arg/default constructor

**public** Student()

{

}

// creating get method to get student name

**public** String getName()

{

**return** studentName;

}

// creating set method to change student name

**public** **void** setName(String newStudentName)

{

studentName = newStudentName;

}

// creating get method to get student id

**public** String getId()

{

**return** studentId;

}

// creating set method to change student id

**public** **void** setId(String newId)

{

studentId = newId;

}

// creating a method to represents string format of student id with student name

**public** String toString()

{

String newStudentId = getId();

String newStudentName = getName();

**return** newStudentId + " " + newStudentName;

}

// creating method to validate student id input by user that should contain exact 6 digits in string format

**public** **boolean** isValidId(String newId)

{

// checking if student id is exact 6 digits

**if** (newId.length() == 6 && newId.matches("[0-9]+"))

{

**return** **true**;

}

**else**

{

**return** **false**;

}

}

// creating method to check if student id input by user, already exists in text file or not

// this method takes two arguments, array list that contains student details and student id given by user

**public** **boolean** IdExists(ArrayList<String> studentList, String id)

{

// using for loop in each student data in array list to match the id

**for**(String str:studentList)

{

**if**(str.contains(id))

{

**return** **false**;

}

}

**return** **true**;

}

}

**TestStudent Class**

**import** java.util.\*;

**import** java.io.\*;

**public** **class** TestStudent {

**public** **static** **void** main(String[] args) **throws** IOException

{

// creating object for class student to do different operations

Student student1 = **new** Student();

// using scanner class to get input from user

Scanner userInput = **new** Scanner(System.***in***);

// reading data from text file

File studentFile = **new** File("students.txt");

// using scanner class to read data from text file

Scanner getStudentDetails = **new** Scanner(studentFile);

// creating array list that takes and stores all the data from text file in specific format

ArrayList<String> studentList = **new** ArrayList<String>();

// using while loop to read each line in text file

**while**(getStudentDetails.hasNext())

{

// removes pre and post spaces from the line and separates data by space in middle

String[] studentDetails = ((getStudentDetails.nextLine()).trim()).split("\\s+");

// storing student id from text file in student id variable

String studentId = studentDetails[0];

String studentName = "";

// using for loop to get student name

**for**(String s:studentDetails)

{

**if** (s.matches("[a-zA-Z]+"))

{

studentName = studentName + " " + s;

}

}

// setting student name

student1.setName(studentName);

// setting student id

student1.setId(studentId);

// adding each student details in array list in string representation format defined in

// student class by calling tostring method

studentList.add(student1.toString());

}

// writes all the data stored in array list to text file with new formatting by calling writeStudents method

*writeStudents*(studentList);

**boolean** loop = **true**;

// using while loop to start the program and asks user options until user quit the program manually

**while**(loop)

{

// starts the program by displaying options to customer

System.***out***.print("Welcome to student details program..! \n");

System.***out***.print("1: Display the students list \n2. Search a student \n3. Add a new student \n4. Quit \nChoose option from above: ");

// stores user input in variable

String option = userInput.nextLine();

System.***out***.println("\n");

// checking if user chose option 1, that is to display students list

**if**(option.equals("1"))

{

// displays student list by using for loop

**for**(String str: studentList)

{

System.***out***.println(str);

}

System.***out***.println("\n");

}

// checking if user chose option 2 that is to display student details with student id input by user

**else** **if**(option.equals("2"))

{

// asking user to input student id that needs to be searched

System.***out***.print("Enter student id you want to search for: ");

String searchId = userInput.nextLine();

// using for loop to get all data in array list

**for**(String str:studentList)

{

// checking if id is valid and matches the requirement and is inside the student details

**if**(str.contains(searchId) && student1.isValidId(searchId))

{

// if found, displays the student details with that id

System.***out***.println(str);

System.***out***.println("\n");

**break**;

}

**else**

{

**continue**;

}

}

}

// checking if user chose option 3 that is to add new student data

**else** **if**(option.equals("3"))

{

String cont = "Y";

// using while to continue adding students until user says no

**while**(cont.equals("Y"))

{

String id;

String name;

// getting new student id

System.***out***.print("Input student id(should be 6 digits only): ");

id = userInput.nextLine();

// getting new student name

System.***out***.print("Input student name: ");

name = " " + userInput.nextLine();

{

// checking if id formatting is valid by calling isvalidid method from student class

**if**(student1.isValidId(id) == **false**)

{

System.***out***.println("Student id is not valid id. Please write 6 digits only for student id.");

**continue**;

}

**else**

{

// checking if id exists by calling idexists method from student class

**if**(student1.IdExists(studentList, id) == **false**)

{

System.***out***.println("Student with this id already exists. Please try again with different id");

**continue**;

}

// if both the criteria are approved then goes further else ends

**else**

{

// setting new student name

student1.setName(name);

// setting new student id

student1.setId(id);

// adding new student details to array list

studentList.add(student1.toString());

// writes all the students details from array list to text file

*writeStudents*(studentList);

// asking user if want to add another student

System.***out***.print("Student data added successfully. Do you want to add another student?(Y/N): ");

String ans = (userInput.nextLine()).toUpperCase();

// if user chooses yes then continues the whole process again

**if**(ans.equals("Y"))

{

**continue**;

}

// if user says no then option 3 ends here and breaks the loop

**else**

{

System.***out***.println("Thank You");

cont = "N";

**break**;

}

}

}

}

}

}

// if user chose option 4 or any unknown option typed by user then program quits and breaks out of loop

**else**

{

System.***out***.println("Thank you. Program ends here.");

loop = **false**;

**break**;

}

}

}

// creating write method to write data from array list to text file

// it takes one arguments, array list with student details

**public** **static** **void** writeStudents(ArrayList<String> studentList) **throws** IOException

{

// calling file writer method to open the file and write the data in it

FileWriter writer = **new** FileWriter("students.txt");

**for**(String str: studentList)

{

// writes each student details line by line with consistent formatting

writer.write(str);

writer.write("\n");

}

writer.close();

}

}