COMSATS UNIVERSITY ISLAMABAD, LAHORE CAMPUS



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Registration No: FA22-BSE-160

Class: Object Oriented Programming

Assignment: Assignment No 2

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Task 1:

Note: Perform the following operations and after each operation print the list.

 Create an arraylist of strings named student and apply given methods on array list.

o Add name of students in arrayList

 Ali

 Ahmad

 Umar

 Talha

 Add two more students at the end of students list using students.add()

o 1)Tooba 2) Waleed

 Print the size of list.

 Add “Hamza” in the start of students.

 Add “Rizwan” as second element of list.

 Sort list of students (using Collections.sort())

 Remove “Tooba” from list.

 Remove the last element from list.

 Display the second element from list.

 Update the name of first student. New name should be “Muhammad Waleed”

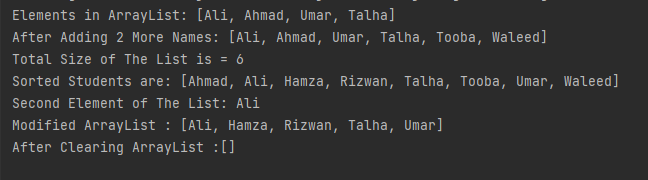
 Remove the first name.

 Remove all elements from the list.

**CODE:**

import java.util.\*;  
  
public class Assign2\_Task1 {  
 public static void main(String[] args) {  
 ArrayList<String> student = new ArrayList<>();  
  
 //Adding names in the arraylist  
  
 student.add("Ali");  
 student.add("Ahmad");  
 student.add("Umar");  
 student.add("Talha");  
 System.*out*.println("Elements in ArrayList: "+student);  
 //Adding Two More Names at the end  
 student.add("Tooba");  
 student.add("Waleed");  
  
 System.*out*.println("After Adding 2 More Names: "+student);  
  
 //Printing Size of List  
 System.*out*.println("Total Size of The List is = "+student.size());  
  
 //Adding Name in the start  
 student.add(0,"Hamza");  
 student.add(1,"Rizwan");  
  
 //Sorting Here  
 Collections.*sort*(student);  
 System.*out*.println("Sorted Students are: "+student);  
  
 student.remove("Tooba");  
  
 student.remove(student.size()-1);  
 //Student at 2nd Element of ArrayList  
 System.*out*.println("Second Element of The List: "+student.get(1));  
  
 student.set( 0 ,"Muhammad Waleed");  
  
 //Removing First Element  
 student.remove(0);  
 System.*out*.println("Modified ArrayList : "+student);  
  
 //Removing All Elements from the list  
 student.clear();  
 System.*out*.println("After Clearing ArrayList :"+student);  
  
  
  
 }  
  
}

**OUTPUT:**



Task 2:

Create a Student class with the following attributes: name (String), id (int), gpa (double), and

major (String). Then, create an ArrayList of Student objects and implement the following

functionality:

Add new students as Objects to the ArrayList.

Print out the details of all students in the ArrayList (each student should be displayed in one line

– use enhanced for loop for printing).

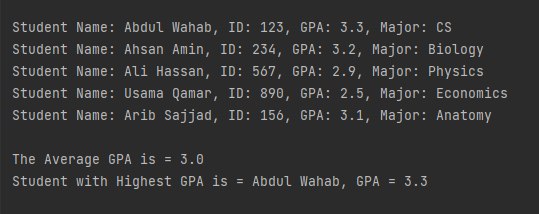
Calculate and print the average GPA of all students in the ArrayList.

Find and print the student with the highest GPA in the ArrayList

**CODE:**

import java.util.\*;  
  
public class Assign2\_Task2 {  
 public static void main(String[] args) {  
  
 ArrayList<Student> students = new ArrayList<>();  
  
 //Creating Objects with Different Data  
 Student s1 = new Student("Abdul Wahab",123,3.3,"CS");  
 Student s2 = new Student("Ahsan Amin",234,3.2,"Biology");  
 Student s3 = new Student("Ali Hassan",567,2.9,"Physics");  
 Student s4 = new Student("Usama Qamar",890,2.5,"Economics");  
  
 //Adding Data to ArrayList  
 students.add(s1);  
 students.add(s2);  
 students.add(s3);  
 //We can add by this way too  
 students.add(new Student("Usama Qamar",890,2.5,"Economics"));  
 students.add(new Student("Arib Sajjad", 156, 3.1,"Anatomy"));  
  
 //Using Enhanced For Loop Here for Printing  
 System.*out*.println();  
 for( Student stu: students){  
  
 System.*out*.println("Student Name: "+stu.getName()+", ID: "+stu.getId()+  
 ", GPA: "+stu.getGpa()+", Major: "+stu.getMajor());  
  
  
 }  
  
 //Now Finding The Average GPA  
  
 double sum = 0 ,average = 0;  
  
 for (int i=0;i<students.size();i++){  
  
 sum += students.get(i).getGpa();  
 }  
 average = sum / students.size();  
 System.*out*.println();  
 System.*out*.println("The Average GPA is = "+average);  
  
 //Finding Max GPA Now  
  
 Student max = students.get(0);  
  
 for (int j=0;j<students.size();j++){  
  
 if (max.getGpa() < students.get(j).getGpa()){  
 max = students.get(j);  
 }  
  
 }  
 System.*out*.println("Student with Highest GPA is = "+max.getName()+", GPA = "+max.getGpa());  
  
 }  
  
}  
  
class Student{  
  
 private String Name;  
 private int id;  
 private double gpa;  
 private String Major;  
  
 //Creating Constructor here for all attributes  
 public Student(String name, int id, double gpa, String major) {  
 Name = name;  
 this.id = id;  
 this.gpa = gpa;  
 Major = major;  
 }  
  
 //Getter and Setter of Private Attributes  
  
 public String getName() {  
 return Name;  
 }  
  
 public void setName(String name) {  
 Name = name;  
 }  
  
 public int getId() {  
 return id;  
 }  
  
 public void setId(int id) {  
 this.id = id;  
 }  
  
 public double getGpa() {  
 return gpa;  
 }  
  
 public void setGpa(double gpa) {  
 this.gpa = gpa;  
 }  
  
 public String getMajor() {  
 return Major;  
 }  
  
 public void setMajor(String major) {  
 Major = major;  
 }  
}

**OUTPUT:**

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