Illustrate the usage of Collection and Generics through a sample program – Develop an application that manipulates Student Data in an Institution. Ensure that your messages are properly logged in a log file

Main – Application.java

**package** Pranav\_221047001;

**import** java.util.Scanner;

**public** **class** Application {

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

{

**int** ch;

Studentarray student=**new** Studentarray();

**do**

{

System.***out***.println("1. Add Student Record");

System.***out***.println("2. View Student Record");

System.***out***.println("3. Search Student Record");

System.***out***.println("4. Delete Student Record");

System.***out***.println("5. Update Student Record");

System.***out***.println("0. Exit");

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

ch = sc.nextInt();

**switch** (ch){

**case** 1:

student.addStudent();

**break**;

**case** 2:

student.viewStudent();

**break**;

**case** 3:

student.searchStudent();

**break**;

**case** 4:

student.deleteStudent();

**break**;

**case** 5:

student.updateStudent();

**break**;

**default**:**break**;

}

}**while**(ch !=0);

}

}

Studentarray.java

**package** Pranav\_221047001;

**import** java.io.IOException;

**import** java.util.ArrayList;

**import** java.util.Iterator;

**import** java.util.List;

**import** java.util.ListIterator;

**import** java.util.Scanner;

**import** java.util.logging.FileHandler;

**import** java.util.logging.Logger;

**import** java.util.logging.SimpleFormatter;

**import** java.util.logging.Level;

**public** **class** Studentarray {

**private** **static** **final** Logger ***logger*** = Logger.*getLogger*(Studentarray.**class**.getName());

**private** **static** **void** configureRootLogger() {

**try** {

FileHandler fh = **new** FileHandler("StudentLogFile.log");

fh.setFormatter(**new** SimpleFormatter());

Logger.*getLogger*("").addHandler(fh);

} **catch** (IOException e) {

***logger***.warning("Could not add handler to log to file");

}

}

List<Student> c=**new** ArrayList<Student>();

**int** studID;

String studName,course;

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

Scanner s1 = **new** Scanner(System.***in***);

Iterator<Student> i=c.iterator();

**boolean** found;

**public** **void** addStudent()

{

*configureRootLogger*();

**try** {

***logger***.setLevel(Level.***FINE***);

System.***out***.println("1. Enter Student ID: ");

studID = sc.nextInt();

***logger***.info("ID:- "+studID+"");

System.***out***.println("2. Enter Student Name");

studName = s1.next();

***logger***.info("Name:- "+studName+"");

System.***out***.println("3. Enter Student course");

course = s1.next();

***logger***.info("Course:- "+course+"");

c.add(**new** Student(studID,studName,course));

***logger***.info("Student Details added successfully");

}

**finally**{

***logger***.info("Added successfully");

}

}

**public** **void** viewStudent()

{

*configureRootLogger*();

Iterator<Student> i2=c.iterator();

**try** {

**while**(i2.hasNext())

{

***logger***.setLevel(Level.***FINE***);

Student s1=i2.next();

System.***out***.println(s1);

}

***logger***.info("Viewing student records");

}

**finally** {

***logger***.info("View Successful");

}

}

**public** **void** searchStudent()

{

*configureRootLogger*();

found=**false**;

System.***out***.println("Enter StudentID to search");

studID=sc.nextInt();

i=c.iterator();

***logger***.info("Searching....");

**while**(i.hasNext())

{

Student s=i.next();

**if**(s.getstudID()==studID)

{

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

found=**true**;

}

}

***logger***.info("Searching student record");

**if**(!found)

{

***logger***.info("Record not found");

}

}

**public** **void** deleteStudent()

{

*configureRootLogger*();

found=**false**;

**try** {

System.***out***.println("Enter StudentID to delete");

studID=sc.nextInt();

i=c.iterator();

**while**(i.hasNext())

{

Student s=i.next();

**if**(s.getstudID()==studID)

{

i.remove();

found=**true**;

}

}

***logger***.info("Deleting student record");

**if**(!found)

{

***logger***.info("Record not found");

}

}

**finally** {

***logger***.info("Student Details Deleted"+studID+"");

}

}

**public** **void** updateStudent()

{

*configureRootLogger*();

found=**false**;

**try** {

System.***out***.println("Enter StudentID to update");

studID=sc.nextInt();

ListIterator<Student> l= c.listIterator();

**while**(l.hasNext())

{

Student p=l.next();

**if**(p.getstudID()==studID)

{

System.***out***.print("Enter new Student name");

studName=s1.next();

***logger***.info("Student Name updated:"+studName+"");

System.***out***.print("Enter course");

***logger***.info("Student Course updated :"+course+"");

course=s1.next();

l.set(**new** Student(studID,studName,course));

found=**true**;

}

}

***logger***.info("Updating student record");

**if**(!found)

{

***logger***.info("Record not found");

}

**else**

{

***logger***.info("Record updated");

}

}**finally**

{

***logger***.info("Student Details updated :" +studID+"");

}

}

}

Student.java

**package** Pranav\_221047001;

**public** **class** Student

{

**private** **int** studID;

**private** String studName,course;

**public** Student(**int** studID, String studName, String course) {

**this**.studID = studID;

**this**.studName = studName;

**this**.course=course;

}

**public** **int** getstudID() {

**return** studID;

}

**public** **void** setrollno(**int** studID) {

**this**.studID = studID;

}

**public** String getstudName() {

**return** studName;

}

**public** String getcourse() {

**return** course;

}

**public** String toString()

{

**return** studID+" "+studName+" " +course;

}

**public** **void** setstudName(String studName) {

**this**.studName = studName;

}

**public** **void** setcourse(String course) {

**this**.course = course;

}

}