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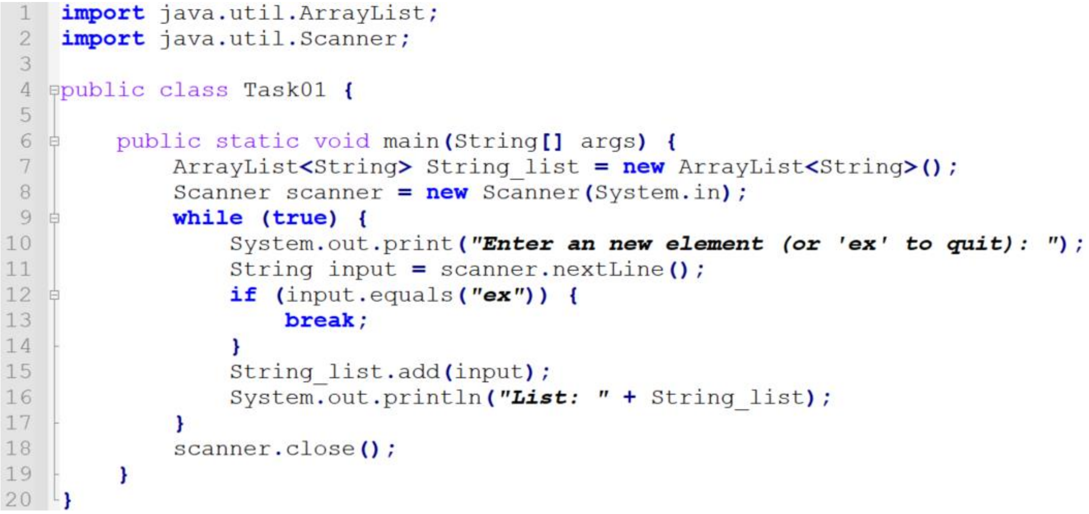
8 Mai 1945 - Sidi-Bel-Abbès

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي والبحث العلمي
المدرسة العليا للإعلام الآلي
8 ماي 1945 - سيدي بلعباس

TP 05-Correction

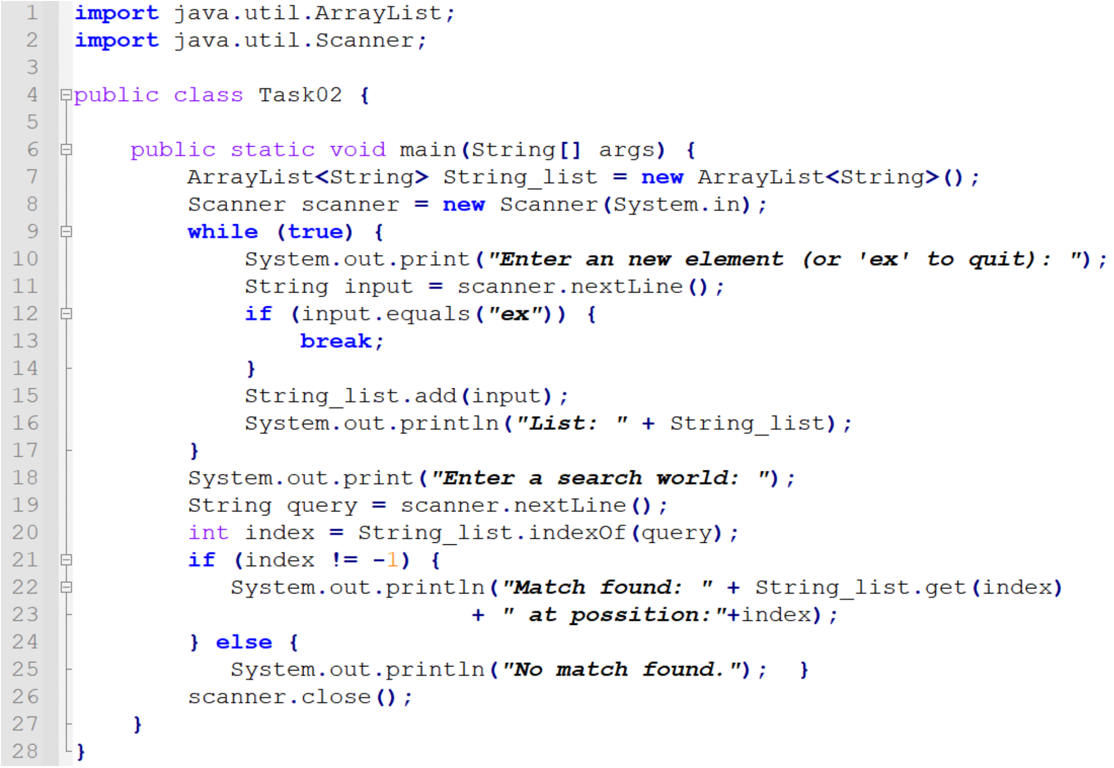
Part One: (ArrayList) ★★★★☆

Task 01➔ Write a Java program to create a new ArrayList (of type String), then ask a user to enter some element, and print out the collection after each entry.



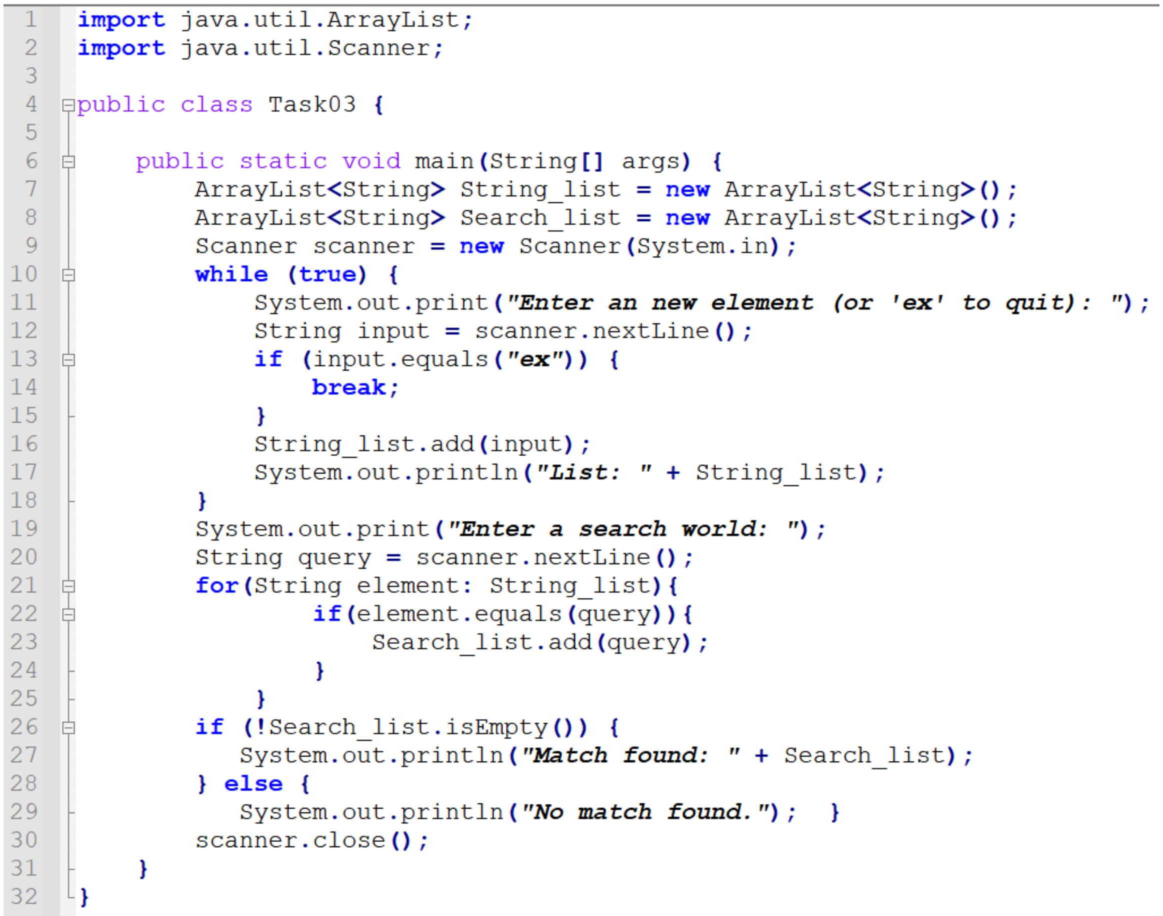
```java
import java.util.ArrayList;
import java.util.Scanner;

public class Task01 {

    public static void main(String[] args) {
        ArrayList<String> String_list = new ArrayList<String>();
        Scanner scanner = new Scanner(System.in);
        while (true) {
            System.out.print("Enter an new element (or 'ex' to quit): ");
            String input = scanner.nextLine();
            if (input.equals("ex")) {
                break;
            }
            String_list.add(input);
            System.out.println("List: " + String_list);
        }
        scanner.close();
    }
}
```

Task 02➔ Add to the past program a Search method that look in the in ArrayList and return the element that match



```java
import java.util.ArrayList;
import java.util.Scanner;

public class Task02 {

    public static void main(String[] args) {
        ArrayList<String> String_list = new ArrayList<String>();
        Scanner scanner = new Scanner(System.in);
        while (true) {
            System.out.print("Enter an new element (or 'ex' to quit): ");
            String input = scanner.nextLine();
            if (input.equals("ex")) {
                break;
            }
            String_list.add(input);
            System.out.println("List: " + String_list);
        }
        System.out.print("Enter a search world: ");
        String query = scanner.nextLine();
        int index = String_list.indexOf(query);
        if (index != -1) {
           System.out.println("Match found: " + String_list.get(index)
                            + " at possition:"+index);
        } else {
           System.out.println("No match found.");   }
        scanner.close();
    }
}
```

Task 03➔ Add to the past program a Search method Search in ArrayList and return a sub list (in case of same element is duplicated)



```java
import java.util.ArrayList;
import java.util.Scanner;

public class Task03 {

    public static void main(String[] args) {
        ArrayList<String> String_list = new ArrayList<String>();
        ArrayList<String> Search_list = new ArrayList<String>();
        Scanner scanner = new Scanner(System.in);
        while (true) {
            System.out.print("Enter an new element (or 'ex' to quit): ");
            String input = scanner.nextLine();
            if (input.equals("ex")) {
                break;
            }
            String_list.add(input);
            System.out.println("List: " + String_list);
        }
        System.out.print("Enter a search world: ");
        String query = scanner.nextLine();
        for(String element: String_list){
                if(element.equals(query)){
                    Search_list.add(query);
                }
            }
        if (!Search_list.isEmpty()) {
           System.out.println("Match found: " + Search_list);
        } else {
           System.out.println("No match found.");   }
        scanner.close();
    }
}
```

In rest of the following tasks, our objective is to create a java program that digitizes the student list and their TP notes:

Task 04➔ Create a student class that contain the following attributes: student id (int and auto generated in the constructor), name, student TP note. This class contain only one method that print student information.

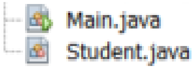
Task 05➔ Create a separate Main class that contain a main method to run our program and a static ArrayList of type Student.

Task 06➔ In the Main class, add the following functionalities and methods:

- Allow a user to enter a student information, create a new student object and then add to the ArrayList.
- Allow a user to search a Student by its name.
- Allow a user to search a set Students that have a similar names.

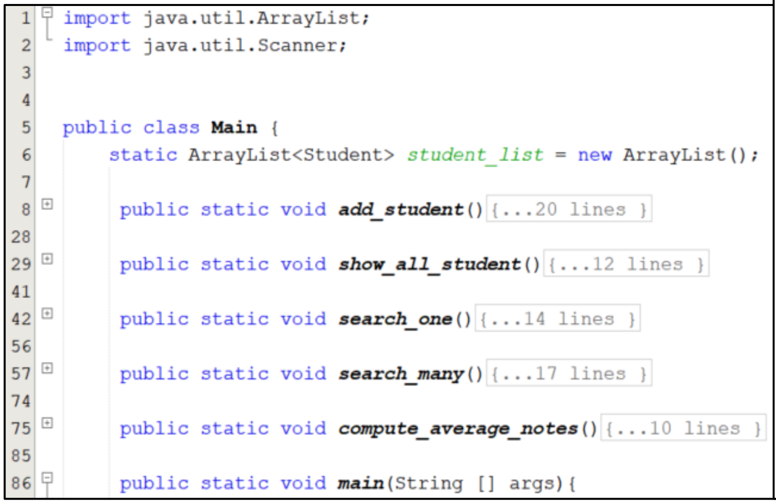
- Allow a user to enter a student TP note.
- Allow a user get average of all classe.

Note: Solution should have these two files

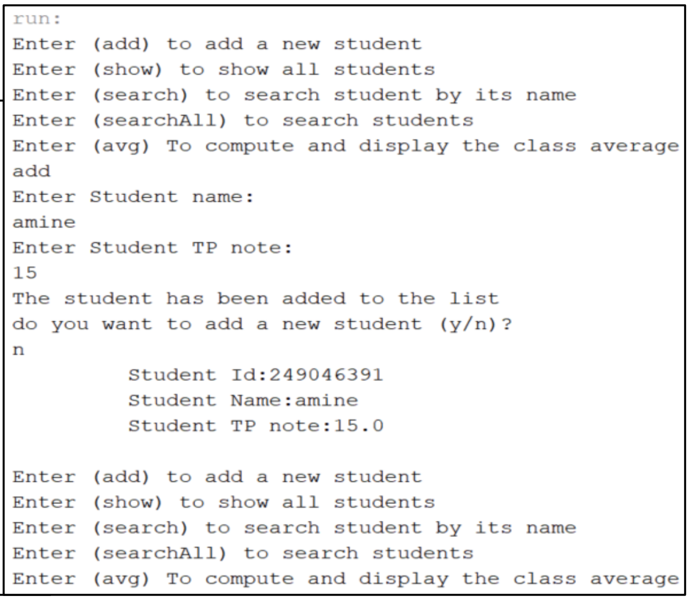


```
Main.java
Student.java
```

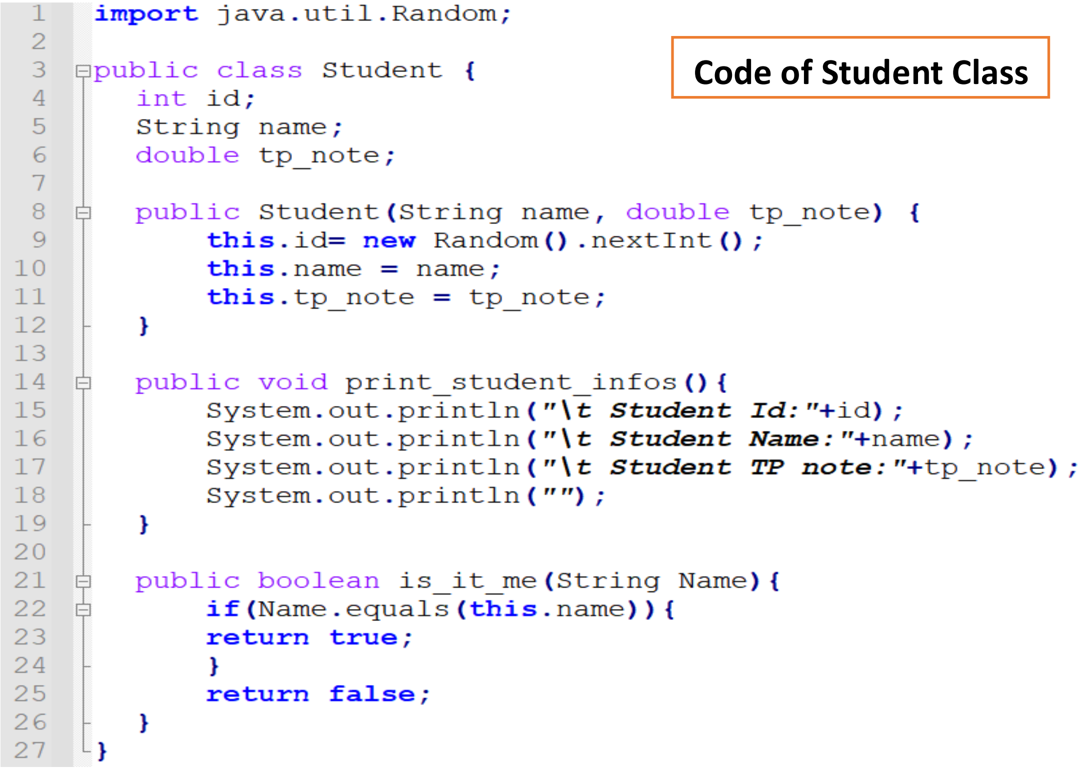
A Part of the Main class sample:



```java
import java.util.ArrayList;
import java.util.Scanner;


public class Main {
    static ArrayList<Student> student_list = new ArrayList();

     public static void add_student() {...20 lines }

     public static void show_all_student() {...12 lines }

     public static void search_one() {...14 lines }

     public static void search_many() {...17 lines }

     public static void compute_average_notes() {...10 lines }

     public static void main(String [] args){
```



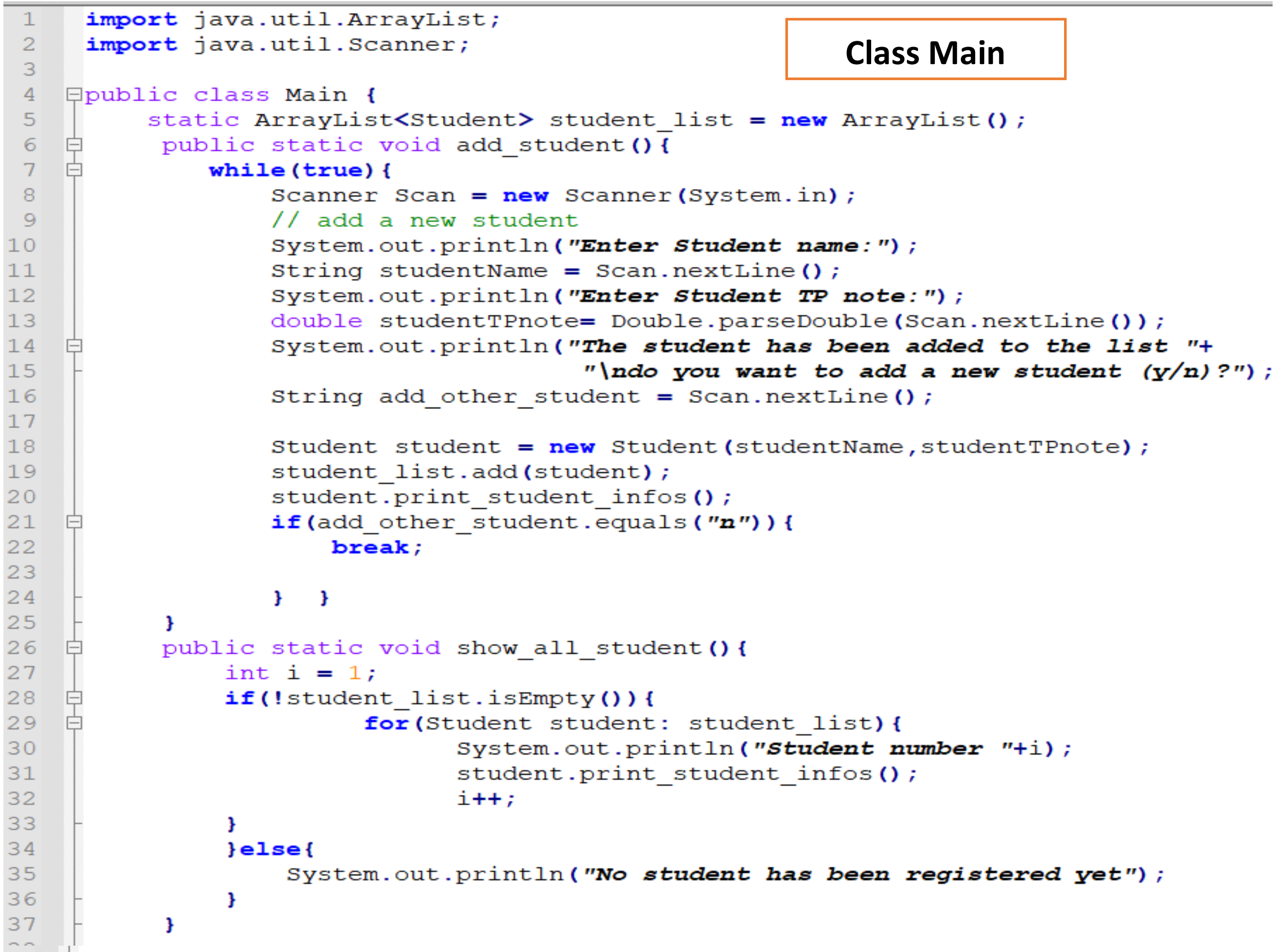
```
run:
Enter (add) to add a new student
Enter (show) to show all students
Enter (search) to search student by its name
Enter (searchAll) to search students
Enter (avg) To compute and display the class average
add
Enter Student name:
amine
Enter Student TP note:
15
The student has been added to the list
do you want to add a new student (y/n)?
n
         Student Id:249046391
         Student Name:amine
         Student TP note:15.0

Enter (add) to add a new student
Enter (show) to show all students
Enter (search) to search student by its name
Enter (searchAll) to search students
Enter (avg) To compute and display the class average
```



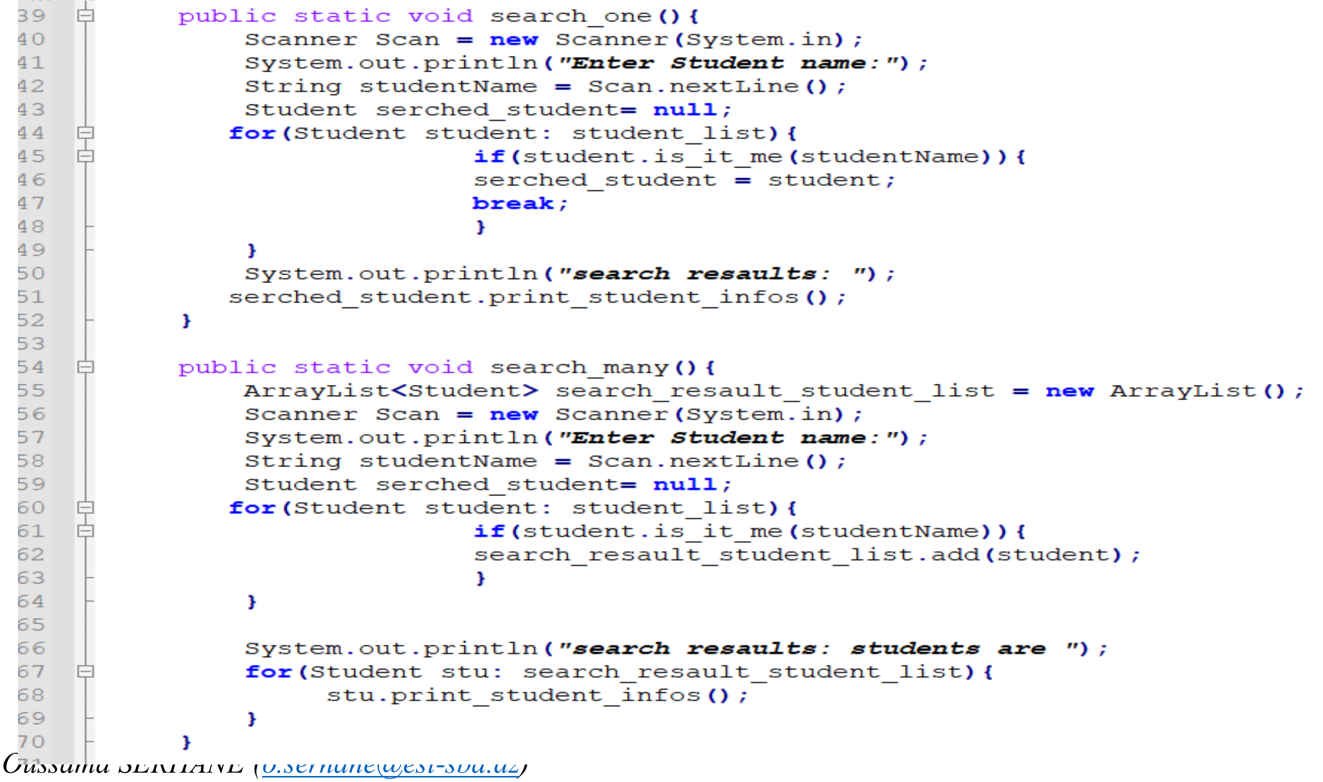
Code of Student Class

```java
import java.util.Random;

public class Student {
   int id;
   String name;
   double tp_note;

   public Student(String name, double tp_note) {
        this.id= new Random().nextInt();
        this.name = name;
        this.tp_note = tp_note;
   }

   public void print_student_infos(){
        System.out.println("\t Student Id:"+id);
        System.out.println("\t Student Name:"+name);
        System.out.println("\t Student TP note:"+tp_note);
        System.out.println("");
   }

   public boolean is_it_me(String Name){
        if(Name.equals(this.name)){
        return true;
        }
        return false;
   }
}
```

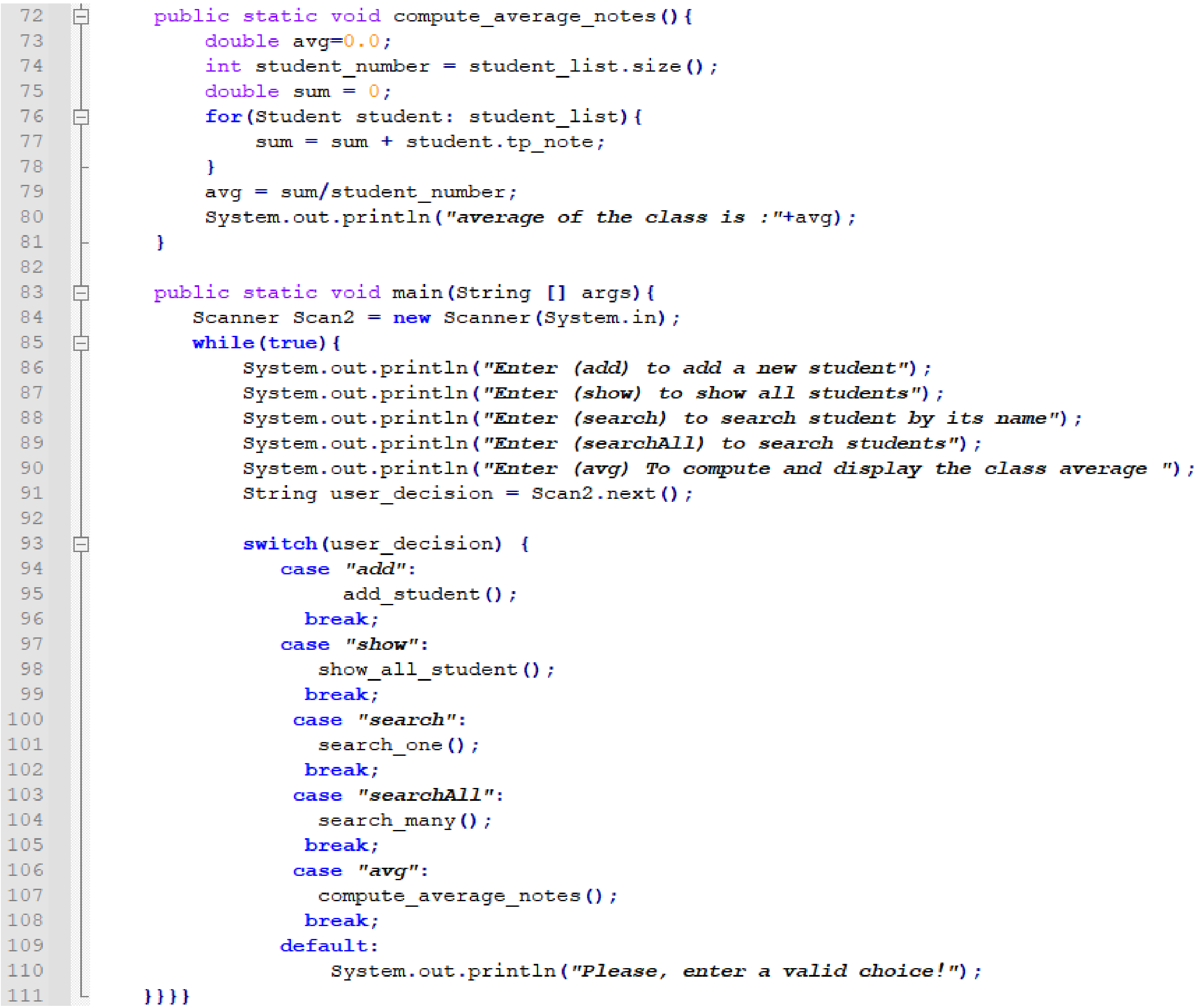
Class Main



```
import java.util.ArrayList;
import java.util.Scanner;

public class Main {
    static ArrayList<Student> student_list = new ArrayList();
     public static void add_student(){
        while(true){
            Scanner Scan = new Scanner(System.in);
            // add a new student
            System.out.println("Enter Student name:");
            String studentName = Scan.nextLine();
            System.out.println("Enter Student TP note:");
            double studentTPnote= Double.parseDouble(Scan.nextLine());
            System.out.println("The student has been added to the list "+
                                "\ndo you want to add a new student (y/n)?");
            String add_other_student = Scan.nextLine();

            Student student = new Student(studentName,studentTPnote);
            student_list.add(student);
            student.print_student_infos();
            if(add_other_student.equals("n")){
                break;

            }   }
     }
     public static void show_all_student(){
         int i = 1;
         if(!student_list.isEmpty()){
                  for(Student student: student_list){
                        System.out.println("Student number "+i);
                        student.print_student_infos();
                        i++;
         }
         }else{
             System.out.println("No student has been registered yet");
         }
     }
```



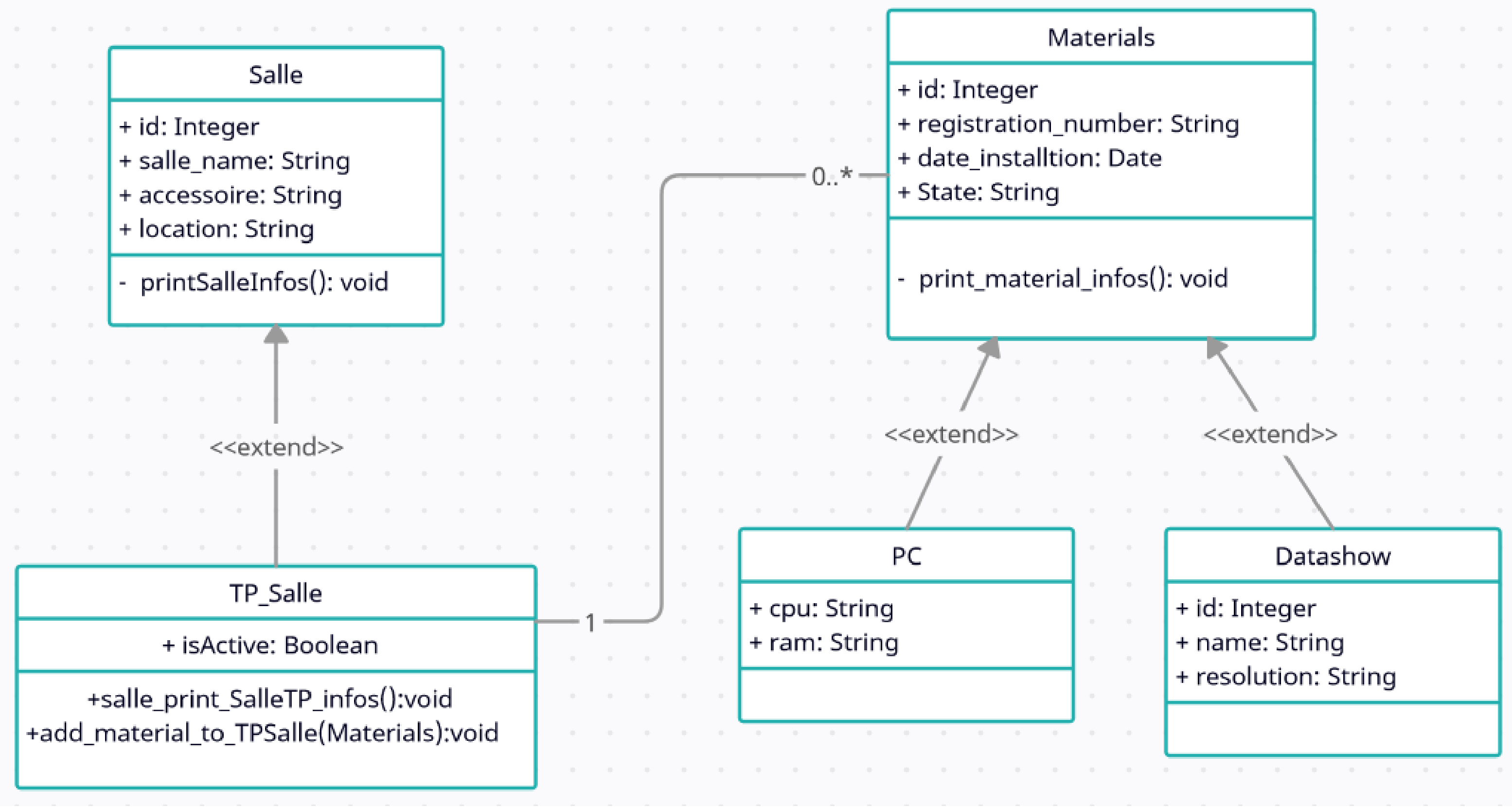
```
     public static void search_one(){
         Scanner Scan = new Scanner(System.in);
         System.out.println("Enter Student name:");
         String studentName = Scan.nextLine();
         Student serched_student= null;
        for(Student student: student_list){
                        if(student.is_it_me(studentName)){
                        serched_student = student;
                        break;
                        }
         }
         System.out.println("search resaults:  ");
        serched_student.print_student_infos();
     }

     public static void search_many(){
         ArrayList<Student> search_resault_student_list = new ArrayList();
         Scanner Scan = new Scanner(System.in);
         System.out.println("Enter Student name:");
         String studentName = Scan.nextLine();
         Student serched_student= null;
        for(Student student: student_list){
                        if(student.is_it_me(studentName)){
                        search_resault_student_list.add(student);
                        }
         }

         System.out.println("search resaults: students are  ");
         for(Student stu: search_resault_student_list){
              stu.print_student_infos();
         }
     }
```



```
 public static void compute_average_notes(){
     double avg=0.0;
     int student_number = student_list.size();
     double sum = 0;
     for(Student student: student_list){
         sum = sum + student.tp_note;
     }
     avg = sum/student_number;
     System.out.println("average of the class is :"+avg);
 }

 public static void main(String [] args){
    Scanner Scan2 = new Scanner(System.in);
    while(true){
        System.out.println("Enter (add) to add a new student");
        System.out.println("Enter (show) to show all students");
        System.out.println("Enter (search) to search student by its name");
        System.out.println("Enter (searchAll) to search students");
        System.out.println("Enter (avg) To compute and display the class average ");
        String user_decision = Scan2.next();

        switch(user_decision) {
           case "add":
                add_student();
             break;
           case "show":
              show_all_student();
             break;
            case "search":
              search_one();
             break;
            case "searchAll":
              search_many();
             break;
            case "avg":
              compute_average_notes();
             break;
           default:
               System.out.println("Please, enter a valid choice!");
}}}}
```

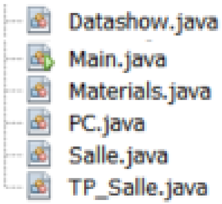
<u>Part Two:</u> Inheritance ★★★★☆

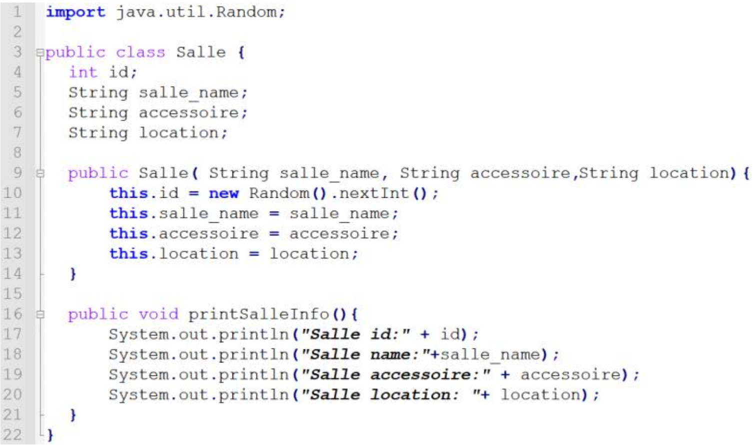
Task 01➔ Using NetBeans, give the java code of the following diagram:



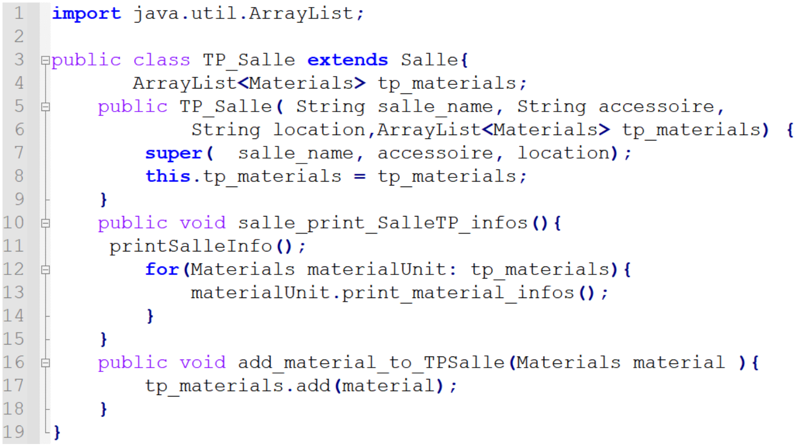
Task 02 <<Optional>> ➔ propose a test for example: create TP_Salle with a set of materials.

The result should be the following classes (files):

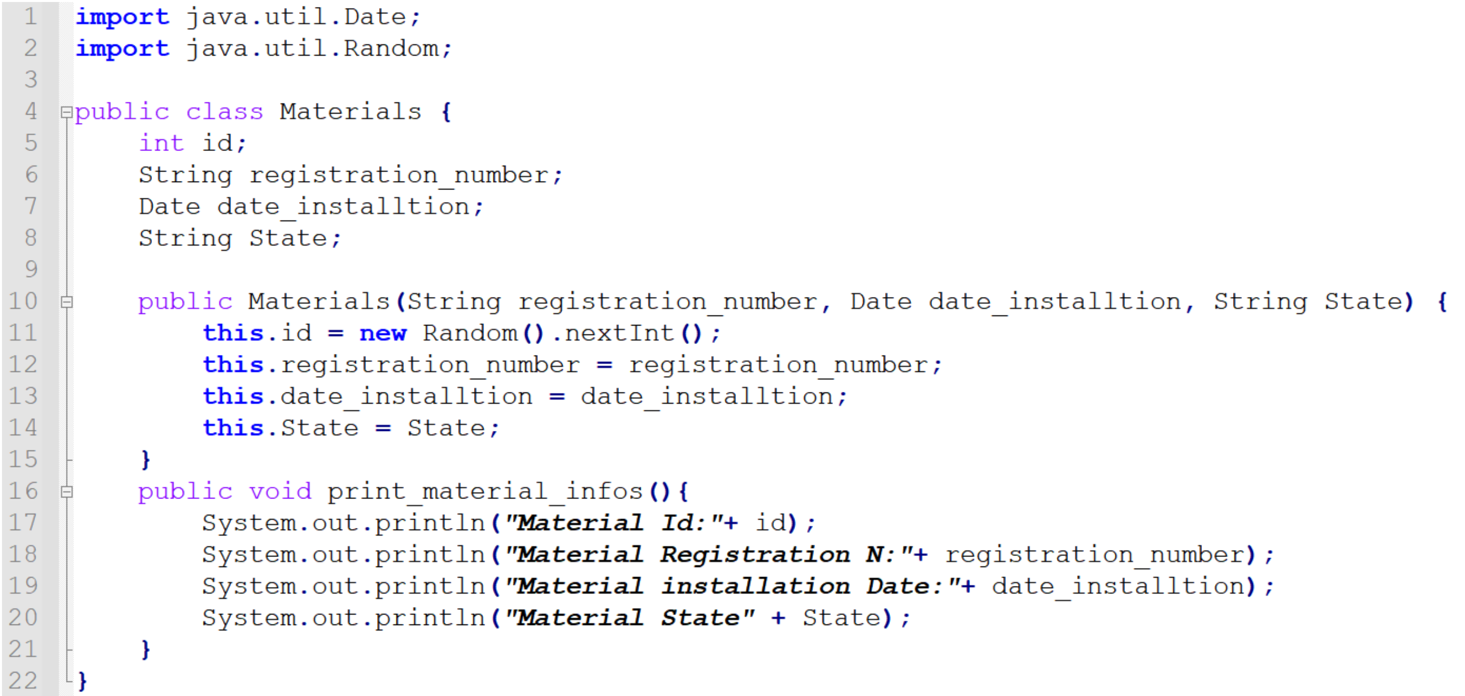

Datashow.java
Main.java
Materials.java
PC.java
Salle.java
TP_Salle.java



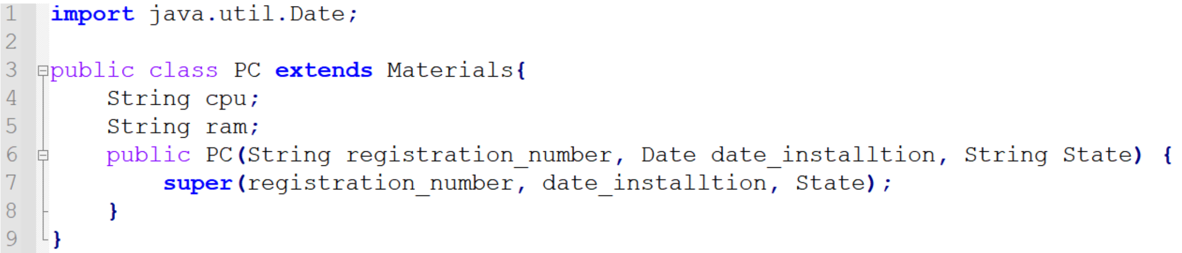
```java
import java.util.Random;

public class Salle {
    int id;
    String salle_name;
    String accessoire;
    String location;

    public Salle( String salle_name, String accessoire,String location) {
        this.id = new Random().nextInt();
        this.salle_name = salle_name;
        this.accessoire = accessoire;
        this.location = location;
    }

    public void printSalleInfo(){
        System.out.println("Salle id:" + id);
        System.out.println("Salle name:"+salle_name);
        System.out.println("Salle accessoire:" + accessoire);
        System.out.println("Salle location:  "+ location);
    }
}
```



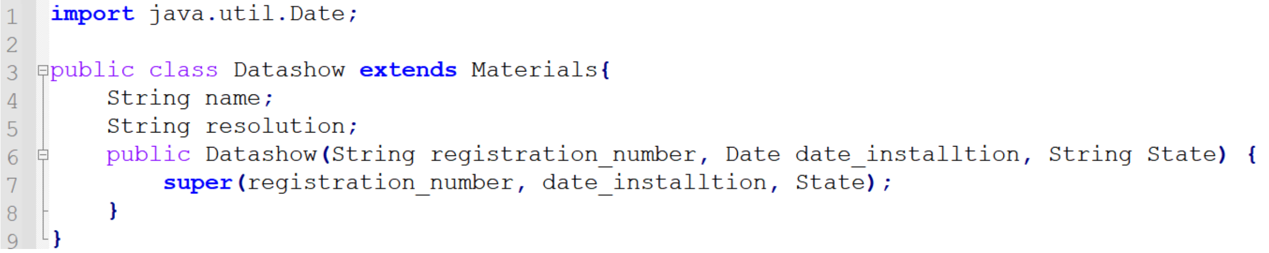
```java
import java.util.ArrayList;

public class TP_Salle extends Salle{
       ArrayList<Materials> tp_materials;
    public TP_Salle( String salle_name, String accessoire,
           String location,ArrayList<Materials> tp_materials) {
        super(  salle_name, accessoire, location);
        this.tp_materials = tp_materials;
    }
    public void salle_print_SalleTP_infos(){
     printSalleInfo();
        for(Materials materialUnit: tp_materials){
            materialUnit.print_material_infos();
        }
    }
    public void add_material_to_TPSalle(Materials material ){
        tp_materials.add(material);
    }
}
```



```java
import java.util.Date;
import java.util.Random;

public class Materials {
    int id;
    String registration_number;
    Date date_installtion;
    String State;

    public Materials(String registration_number, Date date_installtion, String State) {
        this.id = new Random().nextInt();
        this.registration_number = registration_number;
        this.date_installtion = date_installtion;
        this.State = State;
    }
    public void print_material_infos(){
        System.out.println("Material Id:"+ id);
        System.out.println("Material Registration N:"+ registration_number);
        System.out.println("Material installation Date:"+ date_installtion);
        System.out.println("Material State" + State);
    }
}
```



```java
import java.util.Date;

public class PC extends Materials{
    String cpu;
    String ram;
    public PC(String registration_number, Date date_installtion, String State) {
        super(registration_number, date_installtion, State);
    }
}
```



```java
import java.util.Date;

public class Datashow extends Materials{
    String name;
    String resolution;
    public Datashow(String registration_number, Date date_installtion, String State) {
        super(registration_number, date_installtion, State);
    }
}
```