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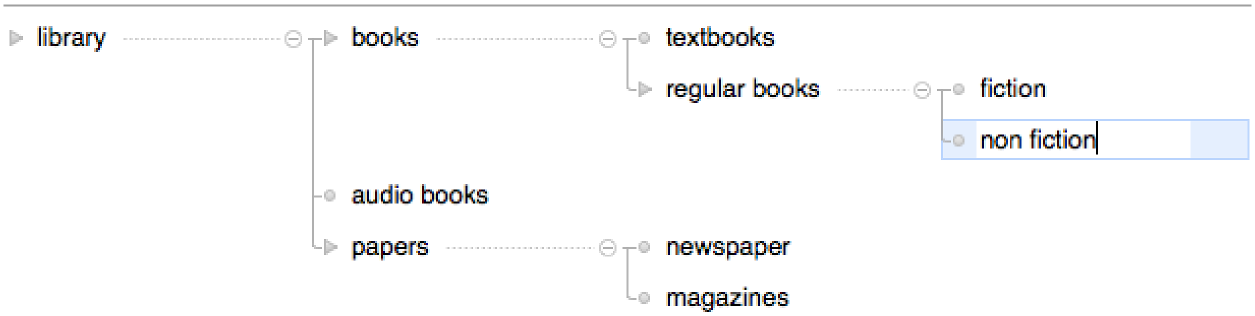
1.



2.

```
public class Library {
        private String title;
        private String id;
        private String author;
        public Library(String title, String id,String author){
                this.title = title;
                this.id = id;
                this.author= author;;
        }
        public String getTitle(){
                return title;
        }
        public void setTitle(String newTitle){
                title = newTitle;
        }
        public String getId(){
                return id;
        }
        public void setId(String newId){
                id=newId;
        }
        public String getAuthor(){
                return author;
        }
        public void setauthor(String newAuthor){
                author = newAuthor;
        }
}
```

6.

```java
import java.util.Scanner;
public class SchoolKid {
    private String name;
    private int age;
    private String teacher;
    private String greeting;

    public void setname(String newName){
        name = newName;
    }
    public void setAge(int newAge){
        age = newAge;
    }
    public void setTeacher(String newTeacher){
        teacher = newTeacher;
    }
    public void setGreeting(String newGreeting){
        greeting = newGreeting;
    }
    public String getName(){
        return name;
    }
    public int getAge(){
        return age;
    }
    public String getTeacher(){
        return teacher;
    }
    public String getGreeting(){
        return greeting;
    }

}
```

7.

```java
public class ExaggertingKid extends SchoolKid {
    public int getAge(){
        int newAge = super.getAge() + 2;
        return newAge;
    }
    public String getGreeting(){
        String greeting = super.getGreeting();
        return greeting + " I am the best";
    }
}
```

8.

```
public abstract class PayCalculator {
        private double payRate;
        public double computePay(int hours){
                return payRate*hours;
        }
        void setPayRate(double payRate){
                this.payRate = payRate;
        }
        public double getPayRate(){
                return payRate;
        }

}
```

9.

```
public class RegularPay extends PayCalculator{
        public RegularPay(double payRate){
                setPayRate(payRate);
        }
}

public class HazardPay extends PayCalculator{
        public HazardPay(double payRate){
                setPayRate(payRate);
        }
        public double computePay(int hours){
                double pay = super.computePay(hours);
                return pay*1.5;
        }
}
```

15.

```
import java.util.Scanner;

public interface MessageEncoder {
        public String encode(String plainText){
                plainText = plainText+"ssss";
                return plainText;
        }

}
```

16.

```
public class SubstitutionCipher implements MessageEncoder {
    private int shift;
    public SubstitutionCipher(int shiftBy){
        shift = shiftBy;
    }
    public String encode(String plainText){
        String encoded="";
        for (int i =0; i<plainText.length();i++){
            char n = plainText.charAt(i);
            encoded = encoded + shift(n,shift);
        }
        return encoded;
    }
}

private char shift(char n, int shiftSpot){
    char shiftN = n;
    if (n >='a' && n <='z'){
        shiftN = (char) ('A'+ (n-'A'+shiftN)%26);
    }
    shiftN;
}
```

17.

```
public class ShuffleCipher implements MessageEncoder {
    private int shuffles;
    public ShuffleCipher(int shuffles){
        this.shuffles = shuffles;
    }
    private String shuffle(String input){
        String shuffled="";
        int midpoint;
        if(input.length()%2==0){
            midpoint= text.length()/2;
        }
        else{
            midpoint= (input.length()+1)/2;
        }
        String first = input.substring(0,midpoint);
        String second = input.substring(midpoint);
        for(int i = 0, j = 0; i<first.length(); i++,j++){
            shuffled = shuffled +first.chartAt(i);
            if( j << second.length()){
                shuffled = shuffled + second.charAt(i);
            }
            return shuffled;
        }
    }
    public String encode(String plainText){
        String ecodedText = plainText;
        for(inti=0;i<shuffles;i++){
            encodedText=shuffle(encodedText);
        }
        return encodedText;
    }

}
```

7.

```
import java.util.Arrays;


public class StudentTester {
    public static void main(String[] args){
        Student[] students=new Student[5];
        students[0]=new Student("Nathaniel", 100);
        students[1]=new Student("Van", 48);
        students[2]=new Student("Norst", 21);
        students[3]=new Student("Alex",22);
        students[4]=new Student("Fallah",101);
        Arrays.sort(students);
        for(Student students:students){
            System.out.print(student);
        }
    }
}

public class Student extends Person implements CompareTo{
    private int studentNumber;
    public Student(String initialName, int initialStudentNumber){
        super(initialName);
        studentNumber = initialStudentNumber;
    }
    public Student(){
        super();
        studentNumber=0;
    }
    public int getStudentNumber(){
        return studentNumber;
    }
    public void setStudentNumber(int newStudentNumber){
        studentNumber=newStudentNumber;
    }
    public int compareTo(Object object){
        if ((object!=null) && (object instanceof Student)){
            Student otherStudent=(Student)object;
            if(getName().compateTo(otherStudent.getname())>0){
                return 1;
                else if(getName().compareTo(otherStudent.getName()),0){
                    return -1;
                }
                else{
                    return 0;
                }
                return -1;
            }
        }
    }
}
```