

Question: 1:

Create Java classes having suitable attributes for Library management system. Use OOPs concepts in your design. Also try to use interfaces and abstract classes.

```
package javaAssignment2;

class Books{
    int bookId;
    String authorName;
    String bookName;
}

abstract class User{
    int id;
    String name;

    User(int id,String name){
        this.name = name;
        this.id = id;
    }
}

class Librarian extends User{
    String phoneNo;
    Librarian(int id,String name,String phoneNo){
        super(id,name);
        this.phoneNo = phoneNo;
    }

    void issueBook(){}
    void addNewBooks(){}
    void removeOldBooks(){}
    void recieveIssuedBooks(){}
    float addFine(){}
}

class Student extends User{
    String phoneNo;
    Student(int id,String name,String phoneNo){
        super(id,name);
        this.phoneNo = phoneNo;
    }

    void getBooks(){}
    void returnBooks(){}
    float payFine(){}
}

public class Ques1 {
}
```

Question: 2:

WAP to sorting string without using string Methods?.

```
package javaAssignment2;

import java.util.Scanner;

public class Ques2 {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        String str = in.nextLine();
        Ques2 obj = new Ques2();
        String sortedString = obj.sort(str.toCharArray());
        System.out.println(sortedString);
    }

    String sort(char[] str) {
        for (int i = 1; i < str.length; i++) {
            char key = str[i];
            int j = i - 1;
            while (j >= 0 && Character.toLowerCase(str[j]) > Character.toLowerCase(key)) {
                str[j + 1] = str[j];
                j = j - 1;
            }
            str[j + 1] = key;
        }
        return String.valueOf(str);
    }
}

/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
JavaTraining
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Process finished with exit code 0
|
```

Question: 3:

WAP to produce NoClassDefFoundError and ClassNotFoundException exception.

```
package javaAssignment2;

public class Ques3 {
    public static void main(String[] args) {
        NoDef obj = new NoDef();
    }
}
```

```
class NoDef{
}
|
```

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
Exception in thread "main" java.lang.NoClassDefFoundError: javaAssignment2/NoDef
    at javaAssignment2.Ques3.main(Ques3.java:5)
Caused by: java.lang.ClassNotFoundException: javaAssignment2.NoDef
    at java.net.URLClassLoader.findClass(URLClassLoader.java:382)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:419)
    at sun.misc.Launcher$AppClassLoader.loadClass(Launcher.java:352)
    at java.lang.ClassLoader.loadClass(ClassLoader.java:352)
    ... 1 more
```

Process finished with exit code 1

```
package javaAssignment2;

public class Ques3 {
    public static void main(String[] args) throws ClassNotFoundException {
        Class.forName("Hello");
    }
}
```

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...  
Exception in thread "main" java.lang.ClassNotFoundException: Hello  
    at java.net.URLClassLoader.findClass(URLClassLoader.java:382)  
    at java.lang.ClassLoader.loadClass(ClassLoader.java:419)  
    at sun.misc.Launcher$AppClassLoader.loadClass(Launcher.java:352)  
    at java.lang.ClassLoader.loadClass(ClassLoader.java:352)  
    at java.lang.Class.forName0(Native Method)  
    at java.lang.Class.forName(Class.java:264)  
    at javaAssignment2.Ques3.main(Ques3.java:5)
```

Process finished with exit code 1

Question: 4:

WAP to create singleton class.

```
package javaAssignment2;  
public class Ques4 {  
    private static Ques4 instance = null;  
  
    public String str;  
  
    private Ques4() { this.str = "Singelction"; }  
  
    public static Ques4 getInstance() {  
        if (instance == null)  
            instance = new Ques4();  
        return instance;  
    }  
}  
  
class A{  
    public static void main(String[] args) {  
        Ques4 obj = Ques4.getInstance();  
        Ques4 obj1 = Ques4.getInstance();  
        Ques4 obj2 = Ques4.getInstance();  
  
        System.out.println(obj.str);  
        System.out.println(obj1.str);  
        System.out.println(obj2.str);  
  
        obj.str = "Hello";  
        obj2.str = "World";  
  
        System.out.println(obj.str);  
        System.out.println(obj1.str);  
        System.out.println(obj2.str);  
    }  
}
```

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...  
Singeltion  
Singeltion  
Singeltion  
World  
World  
World
```

Process finished with exit code 0

Question: 5:

WAP to show object cloning in java using cloneable and copy constructor both.

```
package javaAssignment2;  
  
class Dummy implements Cloneable{  
    int i;  
    Dummy(int i){  
        this.i = i;  
    }  
  
    public Object clone() throws CloneNotSupportedException{  
        return super.clone();  
    }  
}  
  
class Dummy2{  
    int i;  
  
    Dummy2(int i){  
        this.i = i;  
    }  
    Dummy2(Dummy2 obj){  
        this.i = obj.i;  
    }  
}
```

```

public class Ques5 {
    public static void main(String[] args) {
        Dummy obj = new Dummy( 7 );
        Dummy obj2 = null;
        System.out.println("Using Cloneable");
        try{
            obj2 = (Dummy) obj.clone();
            System.out.println("Obj :"+ obj.i );
            System.out.println("Cloned Obj :"+ obj2.i );
        } catch (CloneNotSupportedException e){
            e.printStackTrace();
        }

        System.out.println("\nUsing Copy Constructor");
        Dummy2 obj3 = new Dummy2( 8 );
        Dummy2 obj4 = new Dummy2(obj3);
        System.out.println("Obj :"+ obj3.i );
        System.out.println("Cloned Obj :"+ obj4.i );
    }
}

```

```

/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
Using Cloneable
Obj :7
Cloned Obj :7

Using Copy Constructor
Obj :8
Cloned Obj :8

Process finished with exit code 0
|

```

Question: 6:

WAP showing try, multi-catch and finally blocks.

```

package javaAssignment2;
import java.util.InputMismatchException;
import java.util.Scanner;

public class Ques6 {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        try {
            int n = in.nextInt();
            float div = 100/n;
            System.out.println(div);
        } catch (InputMismatchException e) {
            System.out.println("Integer value not found");
            e.printStackTrace();
        } catch (ArithmeticException e){
            System.out.println("Airthmetic Exception"+ e.getMessage());
            e.printStackTrace();
        } catch (Exception e){
            System.out.println(e.getMessage());
            e.printStackTrace();
        } finally {
            System.out.println("Finally Block");
        }
    }
}

```

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
```

hello

Integer value not found

Finally Block

```

java.util.InputMismatchException
    at java.util.Scanner.throwFor(Scanner.java:864)
    at java.util.Scanner.next(Scanner.java:1485)
    at java.util.Scanner.nextInt(Scanner.java:2117)
    at java.util.Scanner.nextInt(Scanner.java:2076)
    at javaAssignment2.Ques6.main(Ques6.java:9)

```

Process finished with exit code 0

|

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
```

0

Airthmetic Exception/ by zero

Finally Block

```

java.lang.ArithmeticException: / by zero
    at javaAssignment2.Ques6.main(Ques6.java:10)

```

Process finished with exit code 0

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...  
5  
20.0  
Finally Block  
  
Process finished with exit code 0  
|
```

Question: 7:

WAP to convert seconds into days, hours, minutes and seconds.

```
package javaAssignment2;  
  
import java.util.Scanner;  
  
public class Ques7 {  
    public static void main(String[] args) {  
        Scanner in = new Scanner(System.in);  
        int sec = in.nextInt();  
        int day, hour, min, remSec;  
        day = sec / (24 * 3600);  
        sec %= (24 * 3600);  
        hour = sec / 3600;  
        sec %= 3600;  
        min = sec / 60;  
        sec %= 60;  
        remSec = sec;  
  
        System.out.println("Day:" + day + "\n" + "hour:" + min + ":" + remSec);  
    }  
}
```

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...  
93661  
Day:1  
2:1:1  
  
Process finished with exit code 0  
|
```

Question: 8:

WAP to read words from the keyboard until the word done is entered. For each word except done, report whether its first character is equal to its last character. For the required loop, use a

a)while statement

b)do-while statement

```
package javaAssignment2;

import java.util.Scanner;

public class Ques8 {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        String str = "";
        while(!str.equals("done")){
            str = in.nextLine();
            if(str.charAt(0)==str.charAt(str.length()-1)){
                System.out.println("Char first is equal to Char last");
            }
        }

        System.out.println("While Loop Ends");

        str = "";
        do {
            str = in.nextLine();
            if(str.charAt(0)==str.charAt(str.length()-1)){
                System.out.println("Char first is equal to Char last");
            }
        } while(!str.equals("done"));
    }
}
```

```
/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
```

```
hello
world
helloh
Char first is equal to Char last
donw
done
While Loop Ends
hello
world
helloolleh
Char first is equal to Char last
done
```

```
Process finished with exit code 0
```

Question: 9:

Design classes having attributes for furniture where there are wooden chairs and tables, metal chairs and tables. There are stress and fire tests for each products.

```
package javaAssignment2;

abstract class Furniture{
    String material;
    Double stressResistance;
    boolean isFlamable;
    Furniture(String material){
        this.material = material;
    }
    void stressTest(Double stressResistance){
        this.stressResistance = stressResistance;
    }
    void fireTest(boolean isFlamable){
        this.isFlamable = isFlamable;
    }
}

class Chair extends Furniture{
    float height;
    float width;
    float armRestHeight;

    Chair(String material, float height, float width, float armRestHeight) {
        super(material);
        this.height = height;
        this.width = width;
        this.armRestHeight = armRestHeight;
    }
}

class Table extends Furniture{
    float height;
    float width;

    Table(String material, float height, float width){
        super(material);
        this.height = height;
        this.width = width;
    }
}

public class Ques9 {
}
```

Question: 10:

Design classes having attributes and method(only skeleton) for a coffee shop. There are three different actors in our scenario and i have listed the different actions they do also below

* Customer

- Pays the cash to the cashier and places his order, get a token number back
- Waits for the intimation that order for his token is ready
- Upon intimation/notification he collects the coffee and enjoys his drink
(Assumption: Customer waits till the coffee is done, he wont timeout and cancel the order. Customer always likes the drink served. Exceptions like he not liking his coffee, he getting wrong coffee are not considered to keep the design simple.)

* Cashier

- Takes an order and payment from the customer
- Upon payment, creates an order and places it into the order queue
- Intimates the customer that he has to wait for his token and gives him his token
(Assumption: Token returned to the customer is the order id. Order queue is unlimited. With a simple modification, we can design for a limited queue size)

* Barista

- Gets the next order from the queue
- Prepares the coffee
- Places the coffee in the completed order queue
- Places a notification that order for token is ready

```
package javaAssignment2;

public class Ques10 {

class Customer{
    String name;
    String phoneNo;
    Customer(String name,String phoneNo){
        this.name = name;
        this.phoneNo = phoneNo;
    }
    void placeOrder(){ }
    void requestForBill(){ }
    void makePayemnt(){ }
}

class Cashier{
    int empId;
    String name;

    Cashier(int empId,String name){
        this.empId = empId;
        this.name = name;
    }

    float takeOrderAndprepareBill(){ }
    int acceptPayment(){ }
    void addOrderToOrderQueue(){ }
}
```

```

class Barista {
    int empId;
    String name;

    Barista(int empId, String name){
        this.empId = empId;
        this.name = name;
    }
    void prepareCoffee(){}
    void addOrderToCompletedQueue(){}
    int notifyOrderCompletedForToken(){}
}

class Orders{
    private static Orders instance = null;

    int orderIdx = 0; // For OrderId and Token
    int completedOrderIdx = 0; // For Completed Orders
    int[] orderQueue = new int[10000000];
    int[] completedQueue = new int[10000000];

    private Orders() { }

    public static Orders getInstance() {
        if (instance == null)
            instance = new Orders();
        return instance;
    }
}

```

Question: 11:

Convert the following code so that it uses nested while statements instead of for statements:

```

int s = 0;
int t = 1;
for (int i = 0; i < 10; i++)
{
    s = s + i;
    for (int j = i; j > 0; j--)
    {
        t = t * (j - i);
    }
    s = s * t;
    System.out.println("T is " + t);
}
System.out.println("S is " + s);

```

```

package javaAssignment2;

public class Ques11 {
    public static void main(String[] args) {
        int s = 0;
        int t = 1;
        int i = 0;
        while (i < 10) {
            int j = i;
            s = s + i;
            while (j > 0)
            {
                t = t * (j - i);
                j--;
            }
            s = s * t;
            System.out.println("T is " + t);
            i++;
        }
        System.out.println("S is " + s);
    }
}

```

```

/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...
T is 1
T is 0
T is 0
T is 0
T is 0
T is 0
T is 0
T is 0
T is 0
T is 0
T is 0
S is 0

```

Question: 12:

What will be the output on new Child(); ?

```

class Parent extends Grandparent {

    {
        System.out.println("instance - parent");
    }

    public Parent() {
        System.out.println("constructor - parent");
    }

    static {
        System.out.println("static - parent");
    }
}

```

```
class Grandparent {  
  
    static {  
        System.out.println("static - grandparent");  
    }  
  
    {  
        System.out.println("instance - grandparent");  
    }  
  
    public Grandparent() {  
        System.out.println("constructor - grandparent");  
    }  
}  
  
class Child extends Parent {  
  
    public Child() {  
        System.out.println("constructor - child");  
    }  
  
    static {  
        System.out.println("static - child");  
    }  
  
    {  
        System.out.println("instance - child");  
    }  
}
```

```

package javaAssignment2;

public class Ques12 {
    public static void main(String[] args) {
        Child obj = new Child();
    }
}

class Parent extends Grandparent {
    {
        System.out.println("instance - parent");
    }

    public Parent() {
        System.out.println("constructor - parent");
    }

    static {
        System.out.println("static - parent");
    }
}

```

```

package javaAssignment2;

public class Ques11 {
    public static void main(String[] args) {
        int s = 0;
        int t = 1;
        int i = 0;
        while (i < 10) {
            int j = i;
            s = s + i;
            while (j > 0)
            {
                t = t * (j - i);
                j--;
            }
            s = s * t;
            System.out.println("T is " + t);
            i++;
        }
        System.out.println("S is " + s);
    }
}

```



```

class Grandparent {
    static {
        System.out.println("static - grandparent");
    }

    {
        System.out.println("instance - grandparent");
    }

    public Grandparent() {
        System.out.println("constructor - grandparent");
    }
}

class Child extends Parent {
    public Child() {
        System.out.println("constructor - child");
    }

    static {
        System.out.println("static - child");
    }

    {
        System.out.println("instance - child");
    }
}

```

/home/ankit/.sdkman/candidate... Calculating... -zulu/bin/java ...

```

static - grandparent
static - parent
static - child
instance - grandparent
constructor - grandparent
instance - parent
constructor - parent
instance - child
constructor - child

```

Process finished with exit code 0

Question: 13:

Create a custom exception that do not have any stack trace.

```

import java.util.Scanner;

class MyCustomEvenException extends Exception{
    MyCustomEvenException(String message,boolean flag){
        super(message,null,flag,!flag);
    }
}

public class Ques13 {
    public static void main(String[] args) {
        System.out.println("Enter Even Value");
        try {
            Scanner in = new Scanner(System.in);
            int evenValue = in.nextInt();
            if(evenValue%2!=0){
                throw new MyCustomEvenException("Integer is not even",true);
            } else{
                System.out.println("Even Integer");
            }
        } catch (MyCustomEvenException e){
            e.printStackTrace();
        }
    }
}

```

```

/home/ankit/.sdkman/candidates/java/8.0.242-zulu/bin/java ...

```

```

Enter Even Value

```

```

7

```

```

javaAssignment2.MyCustomEvenException: Integer is not even

```

```

Process finished with exit code 0

```