Gokul Jayan
20BCE1249

Lab Exercise on Exception Handling

Question 1

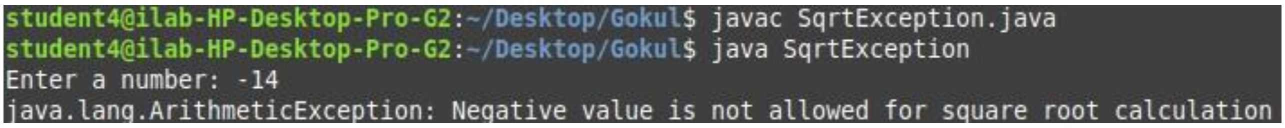
Write an application that throws and catches an ArithmeticException when you attempt to take the square root of a negative value. Prompt the user for an input value and try the Math.sqrt() method on it. The application either displays the square root or catches the thrown Exception and displays an appropriate message. Save the file as SqrtException.java.

CODE:

```
import java.util.Scanner;

public class SqrtException
{
  public static void main(String[] args)
  {
    Scanner in = new Scanner (System.in);
    System.out.print("Enter a number: ");
    double n= in.nextInt();
    try
    {
      if(n<0)
      throw new ArithmeticException("Negative value is not allowed for square root calculation");
      else
      System.out.println("Square root of "+n+": "+Math.sqrt(n));
    }
    catch(ArithmeticException a)
    {
      System.out.println(a);
    }
  }
}
```

OUTPUT:



```
student4@ilab-HP-Desktop-Pro-G2:~/Desktop/Gokul$ javac SqrtException.java
student4@ilab-HP-Desktop-Pro-G2:~/Desktop/Gokul$ java SqrtException
Enter a number: -14
java.lang.ArithmeticException: Negative value is not allowed for square root calculation
```

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Question 2

The Double.parseDouble() method requires a String argument, but it fails if the String cannot be converted to a floating-point number. Write an application in which you try accepting a double input from a user and catch a NumberFormatException if one is thrown. The catch block forces the number to 0 and displays an appropriate error message. Following the catch block, display the number. Save the file as TryToParseDouble.java.

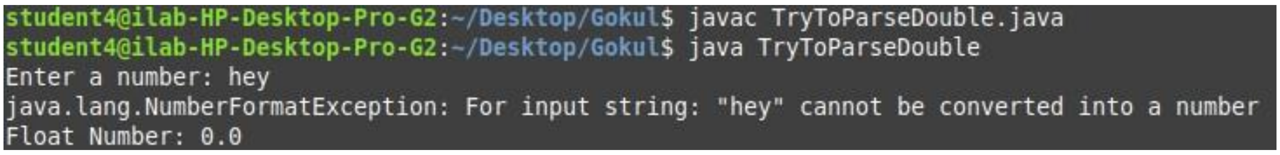
CODE:

```
import  java.util.Scanner;

public class TryToParseDouble
{
  public static void main(String[] args)
  {
    Scanner in = new Scanner (System.in);
    System.out.print("Enter a number: ");
    String s = in.next();
    Double value;
    try
    {
      value=Double.parseDouble(s);

    }
    catch(NumberFormatException obj)
    {
      System.out.println(obj+" cannot be converted into a number");
      value=0.0;
    }
    System.out.println("Float Number: "+value);
  }
}
```

OUTPUT:



```
student4@ilab-HP-Desktop-Pro-G2:~/Desktop/Gokul$ javac TryToParseDouble.java
student4@ilab-HP-Desktop-Pro-G2:~/Desktop/Gokul$ java TryToParseDouble
Enter a number: hey
java.lang.NumberFormatException: For input string: "hey" cannot be converted into a number
Float Number: 0.0
```

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<u>Question 3</u>

Define Employee class with Employee code, name, date of birth and date of appointment. The Employee code must have the format of year-designation-number. The year is a two digit integer such as 87. the designation is a single letter code M for manager, A for Administrative staff, H for HR dept staff, E for Executive staff, and T for Technical staff. The number is a three digit number. The following are some sample employee codes.

82-M-183

76-A-242

71-H-107

Write a Java program to read the employee code, name, date of birth, and date of appointment and validate the employee code. If the employee code is incorrect a suitable user defined exception must be thrown. Then verify if date of birth is before date of appointment. If it is not so, then throw another user defined Exception. If it is correct, then create the Employee object, display the count of employee and display the details of employees.

CODE:

```
import java.util.Scanner;

class InvalidECodeException extends Exception
{
   InvalidECodeException(String msg)
   {
      super(msg);
   }
}

class InvalidDOAException extends Exception
{
   InvalidDOAException(String msg)
   {
      super(msg);
   }
}
class Employee
{
   static String ecode, name, dob, doa;

   Employee(String ecode, String name, String dob, String doa)
   {
      this.ecode=ecode;
      this.name=name;
      this.dob=dob;
      this.doa=doa;
   }
}

public class TestEmployee
{
   public static boolean isNumber(String str)
```

```
    {
        for(int i=0;i<str.length();i++)
        {
            if(str.charAt(i) >= '0' && str.charAt(i) <= '9')
            return true;
        }
        return false;
    }

    public static boolean isAlpha(char c)
    {
        if(c=='M' || c=='A' || c=='H' || c=='E' || c=='T')
        return true;
        else
        return false;
    }

    public static boolean isValid(String ecode) throws InvalidECodeException
    {
        if (ecode.length()==8)
        {
            if(isNumber(ecode.substring(0,2)) && isAlpha(ecode.charAt(3)) &&
isNumber(ecode.substring(5,8)))
            return true;
            else
            throw new InvalidECodeException("Invalid employee code");
        }
        else
        throw new InvalidECodeException("Invalid employee code");
    }

    public static boolean isBefore(String dob, String doa) throws InvalidDOAException
    {
        if (Integer.valueOf(dob.substring(6,10))<Integer.valueOf(doa.substring(6,10)))
        return true;
        else if(Integer.valueOf(dob.substring(6,10))>Integer.valueOf(doa.substring(6,10)))
        throw new InvalidDOAException("DOB is not before DOA");
        else
        {
            if(Integer.valueOf(dob.substring(3,5))<Integer.valueOf(doa.substring(3,5)))
            return true;
            else if(Integer.valueOf(dob.substring(3,5))>Integer.valueOf(doa.substring(3,5)))
            throw new InvalidDOAException("DOB is not before DOA");
            else
            {
                if(Integer.valueOf(dob.substring(0,2))<Integer.valueOf(doa.substring(0,2)))
                return true;
                else
                throw new InvalidDOAException("DOB is not before DOA");
            }
        }
    }


    public static void main(String[] args)
    {
        String ecode, name, dob, doa;
        Scanner in = new Scanner(System.in);
        int count=0, i;
        System.out.print("Enter no:of employees: ");
        int n=in.nextInt();
        Employee[] e= new Employee[n];

        for(i=0;i<n;i++)
        {
            System.out.print("\nEnter ecode: ");
            ecode=in.next();
            System.out.print("Enter name : ");
            name=in.next();

            System.out.print("Enter dob  : ");
            dob=in.next();
            System.out.print("Enter doa  : ");
            doa=in.next();

            try
            {
                if(isValid(ecode) && isBefore(dob,doa))
                {
                    e[count]=new Employee(ecode, name, dob, doa);
                    count++;
                }
            }
            catch (InvalidECodeException e1)
            {
                System.out.println("Exception occured: " + e1);
            }

            catch (InvalidDOAException e2)
            {
                System.out.println("Exception occured: " + e2);
            }

        }

        System.out.println("\nNo: of valid Employees: "+count);
        for(i=0;i<count;i++)
        {
            System.out.println("\nEmployee-"+(i+1)+": ");
            System.out.println("Ecode: "+e[i].ecode);
            System.out.println("Name : "+e[i].name);
            System.out.println("DOB  : "+e[i].dob);
            System.out.println("DOA  : "+e[i].doa);
        }
    }
}
```

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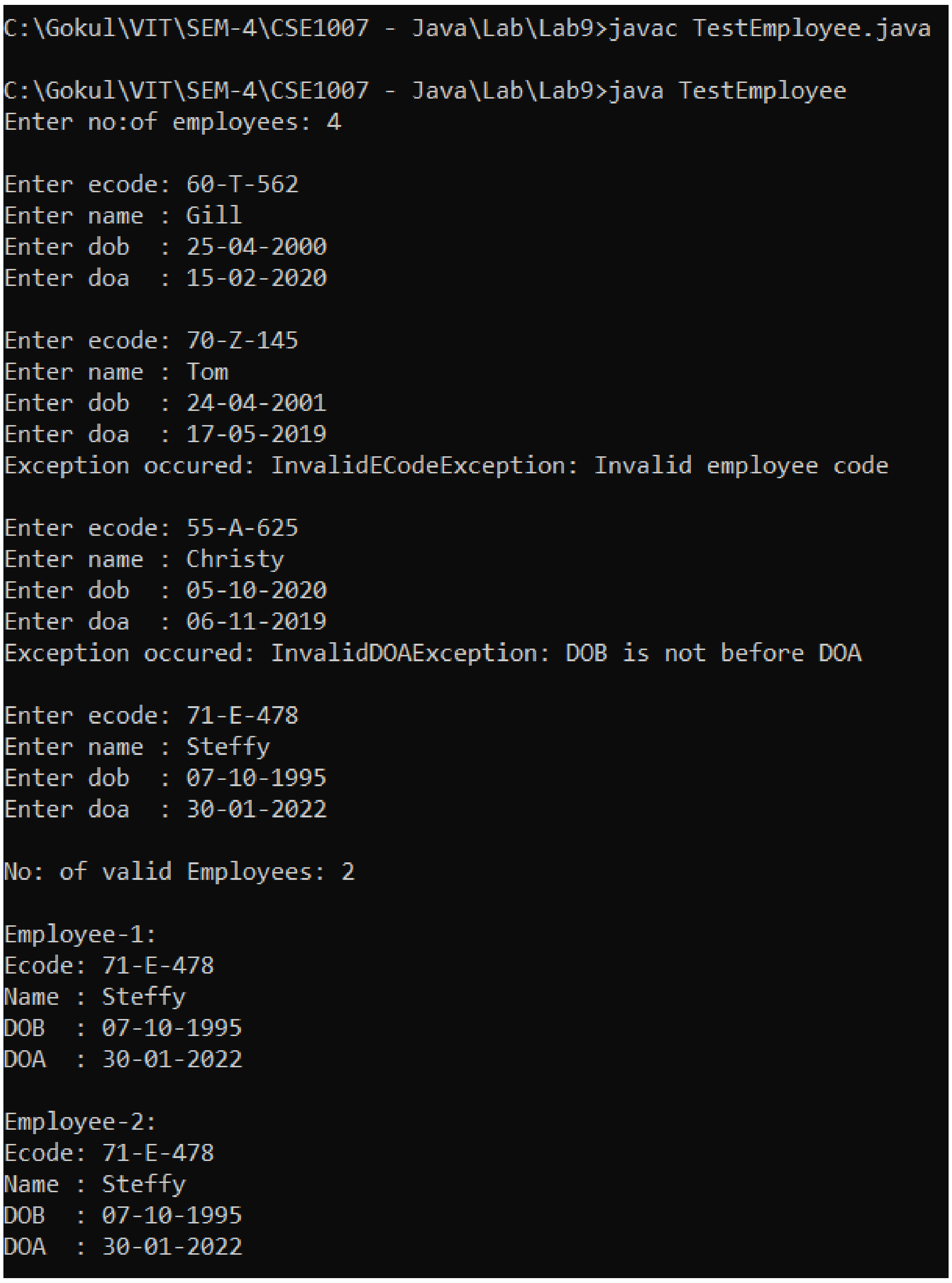
OUTPUT:



```
C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab9>javac TestEmployee.java

C:\Gokul\VIT\SEM-4\CSE1007 - Java\Lab\Lab9>java TestEmployee
Enter no:of employees: 4

Enter ecode: 60-T-562
Enter name : Gill
Enter dob  : 25-04-2000
Enter doa  : 15-02-2020

Enter ecode: 70-Z-145
Enter name : Tom
Enter dob  : 24-04-2001
Enter doa  : 17-05-2019
Exception occured: InvalidECodeException: Invalid employee code

Enter ecode: 55-A-625
Enter name : Christy
Enter dob  : 05-10-2020
Enter doa  : 06-11-2019
Exception occured: InvalidDOAException: DOB is not before DOA

Enter ecode: 71-E-478
Enter name : Steffy
Enter dob  : 07-10-1995
Enter doa  : 30-01-2022

No: of valid Employees: 2

Employee-1:
Ecode: 71-E-478
Name : Steffy
DOB  : 07-10-1995
DOA  : 30-01-2022

Employee-2:
Ecode: 71-E-478
Name : Steffy
DOB  : 07-10-1995
DOA  : 30-01-2022
```