

Lab Activities:

A. Built-in Exceptions Handle

```
class ArithmeticException_Demo
{
    public static void main(String args[])
    {
        try {
            int a = 30, b = 0;
            int c = a/b;
            System.out.println ("Result = " + c);
        }
        catch(ArithmeticException e) {
            System.out.println (e);
            System.out.println ("Can't divide a number by 0");
        }
    }
}

Class Testthrows1 {
    Void m () throws IOException
    {
        throw new IOException("device error");//checked exception
    }
}
```

Lab problem 1:

- Write a program that creates a *Calculator* class. The class contains two variables of integer type. Design a constructor that accepts two values as parameter and set those values.
- Design four methods named *Add ()*, *Subtract ()*, *multiply ()*, *Division ()* for performing addition, subtraction, multiplication and division of two numbers.
- For addition and subtraction, two numbers should be positive. If any negative number is entered then throw an exception in respective methods. So design an exception handler (*ArithmeticException*) in *Add ()* and *Subtract ()* methods respectively to check whether any number is negative or not.
- For division and multiplication two numbers should not be zero. If zero is entered for any number then throw an exception in respective methods. So design an exception handler (*ArithmeticException*) in *multiply ()* and *Division ()* methods respectively to check whether any number is zero or not.
- Write a main class and declare four objects of *Calculator* class. Perform addition (obj1), subtraction (obj2), multiply (obj3) and division (obj4) operations for these objects. If any non integer values are provided as input; then you should throw an exception (*NumberFormatException*) and display a message that informs the user of the wrong input before exiting.

B. User Defined Exceptions Handle

Lab problem 2:

- Create a exception class named *MyException* that extend a base class named *Exception*
- Design a constructor in your class that accepts a string value set it to the super class constructor to display the exception message.
- Create a main class named *product*. Write a method inside the class called *productCheck(int weight)* that accepts weight of the product. Inside the method, if the weight is less than 100 then throw an exception "Product is invalid" otherwise print the weight of the product.
- Inside the main method declare single object of the product class and call the *productCheck()* method to display the weight of the product.

C. Java Multi-catch block

- At a time only one exception occurs and at a time only one catch block is executed.
- All catch blocks must be ordered from most specific to most general, i.e. catch for *ArithmeticException* must come before catch for *Exception*.

```
public class MultipleCatchBlock1 {  
  
    public static void main(String[] args) {  
  
        try{  
            int a[]=new int[5];  
            a[5]=30/0;  
        }  
        catch(ArithmeticException e)  
        {  
            System.out.println("Arithmetic Exception occurs");  
        }  
        catch(ArrayIndexOutOfBoundsException e)  
        {  
            System.out.println("ArrayIndexOutOfBoundsException  
occurs");  
        }  
        catch(Exception e)  
        {  
            System.out.println("Parent Exception occurs");  
        }  
        System.out.println("rest of the code");  
    }  
}
```

- Try for the following code:

```
1. try{  
    int a[]=new int[5];  
    System.out.println(a[10]);  
}  
2.  
try{  
    int a[]=new int[5];  
    a[5]=30/0;  
    System.out.println(a[10]);  
}  
3.  
try{  
    String s=null;  
    System.out.println(s.length());  
}
```

4.

```
class MultipleCatchBlock5{
    public static void main(String args[]){
        try{
            int a[]=new int[5];
            a[5]=30/0;
        }
        catch(Exception e){System.out.println("common task completed");}
        catch(ArithmeticException e){System.out.println("task1 is completed");}
        catch(ArrayIndexOutOfBoundsException e){System.out.println("task 2 completed");}

        System.out.println("rest of the code...");
    } }
}
```

- Grouping exception in catch block

```
catch (NoSuchPaddingException | NoSuchAlgorithmException
      | InvalidKeyException | BadPaddingException
      | IllegalBlockSizeException | IOException ex) {
    System.err.println(ex);
}
```

D. Java Nested try block

```
class Excep6{
    public static void main(String args[]){
        try{
            try{
                System.out.println("going to divide");
                int b =39/0;
            }
            catch(ArithmeticException e)
            {System.out.println(e);}

            try{
                int a[]=new int[5];
                a[5]=4;
            }
            catch(ArrayIndexOutOfBoundsException e)
            {System.out.println(e);}
            System.out.println("other statement");
        }
        catch(Exception e)
        {System.out.println("handeled");}
        System.out.println("normal flow..");
    }
}
```