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Lab Manual: 09

Lab Topic: Exception Handling

Course Code: CSE110 (Object Oriented Programming)

Course Instructor: Mahamudul Hasan, Senior Lecturer, CSE

Lab Objective

1. **Learn a** mechanism to handle Exception in Java program

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("ArrayIndexOutOfBounds Exception
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..");
        }
    }
```