Experiment No. 9
Implement a program on Exception handling.
Date of Performance:
Date of Submission:

Aim: Implement a program on Exception handling.

Objective: To able handle exceptions occurred and handle them using appropriate keyword

Theory:

The Exception Handling in Java is one of the powerful mechanisms to handle the runtime errors so that the normal flow of the application can be maintained.

Exception Handling is a mechanism to handle runtime errors such as ClassNotFoundException, IOException, SQLException, RemoteException, etc.

Java Exception Keywords

Java provides five keywords that are used to handle the exception. The following table describes each.

Keyword	Description
try	The "try" keyword is used to specify a block where we should place an exception code. It means we can't use try block alone. The try block must be followed by either catch or finally.
catch	The "catch" block is used to handle the exception. It must be preceded by try block which means we can't use catch block alone. It can be followed by finally block later.
finally	The "finally" block is used to execute the necessary code of the program. It is executed whether an exception is handled or not.
throw	The "throw" keyword is used to throw an exception.
throws	The "throws" keyword is used to declare exceptions. It specifies that there may occur an exception in the method. It doesn't throw an exception. It is always used with method signature.

```
public class JavaExceptionExample{

  public static void main(String args[]){

   try{

      //code that may raise exception

      int data=100/0;
```

```
    }catch(ArithmeticException e){System.out.println(e);}

     //rest code of the program

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

    }

}
```

Output:

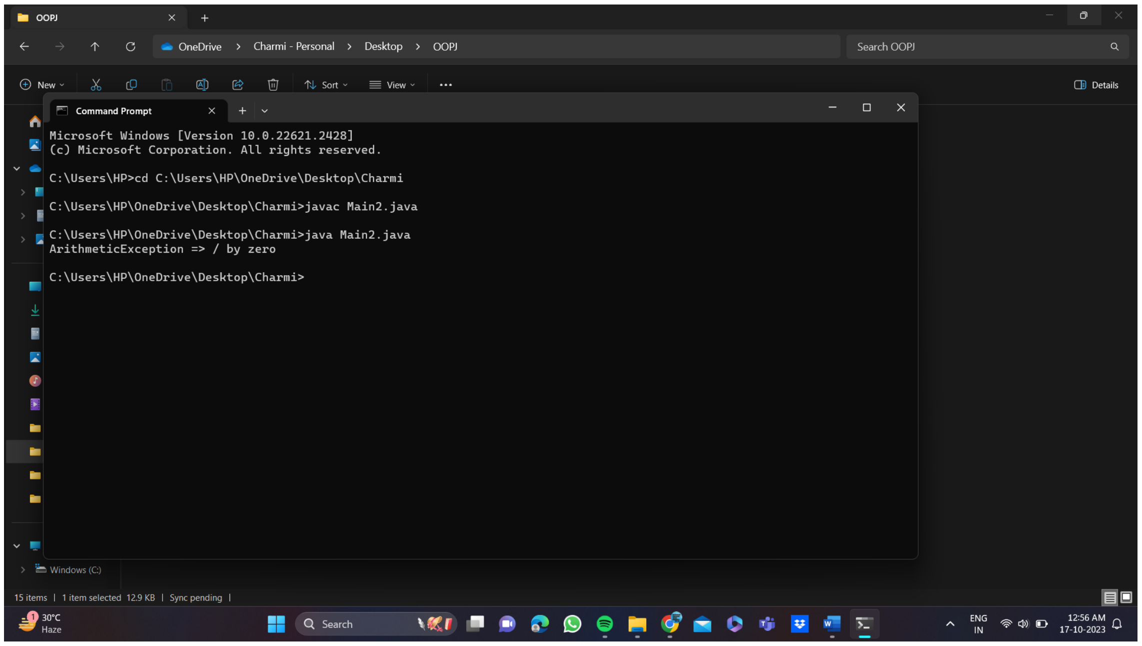
```
Exception in thread main java.lang.ArithmeticException:/ by zero
rest of the code...
```

Code:

1} Try-catch

```
class Main2
{
public static void main(String args[])
{
try{
  int divideByZero = 8/0;
  System.out.println("Rest of code in try block");
    }

    catch (ArithmeticException e) {
      System.out.println("ArithmeticException => " + e.getMessage());
    }
  }
}
```



```
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C:\Users\HP>cd C:\Users\HP\OneDrive\Desktop\Charmi

C:\Users\HP\OneDrive\Desktop\Charmi>javac Main2.java

C:\Users\HP\OneDrive\Desktop\Charmi>java Main2.java
ArithmeticException => / by zero

C:\Users\HP\OneDrive\Desktop\Charmi>
```
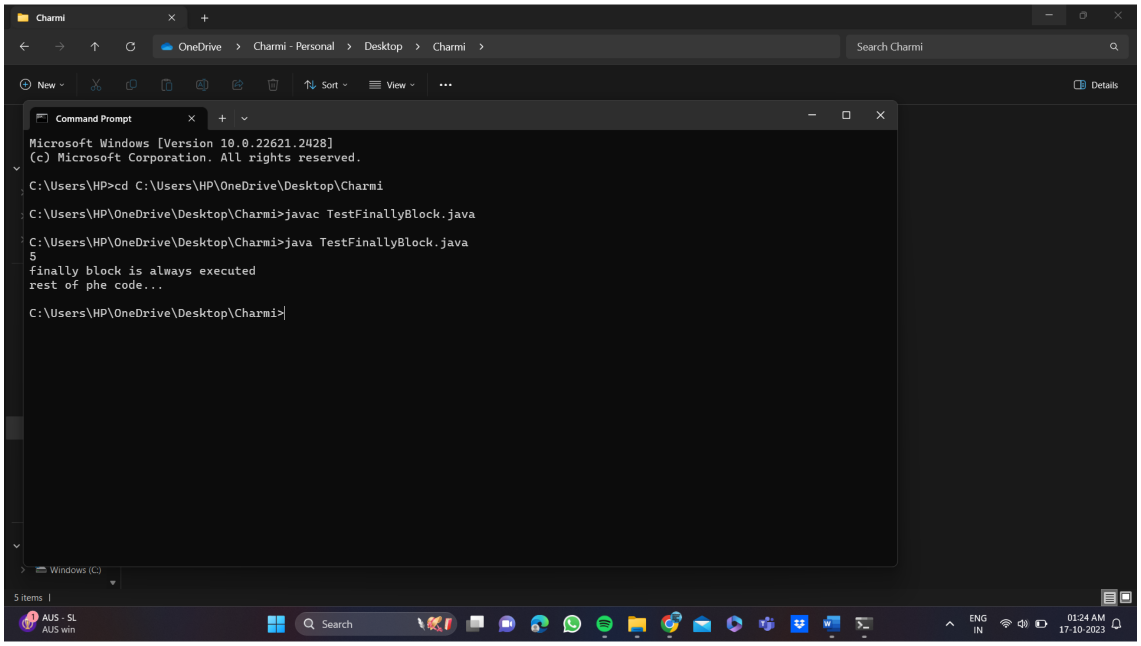

2} finally

```
class TestFinallyBlock {
  public static void main(String args[]){
  try{
   int data=25/5;
   System.out.println(data);
  }
  catch(NullPointerException e){
System.out.println(e);
}
 finally {
System.out.println("finally block is always executed");
}

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



```
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C:\Users\HP>cd C:\Users\HP\OneDrive\Desktop\Charmi

C:\Users\HP\OneDrive\Desktop\Charmi>javac TestFinallyBlock.java

C:\Users\HP\OneDrive\Desktop\Charmi>java TestFinallyBlock.java
5
finally block is always executed
rest of phe code...

C:\Users\HP\OneDrive\Desktop\Charmi>
```
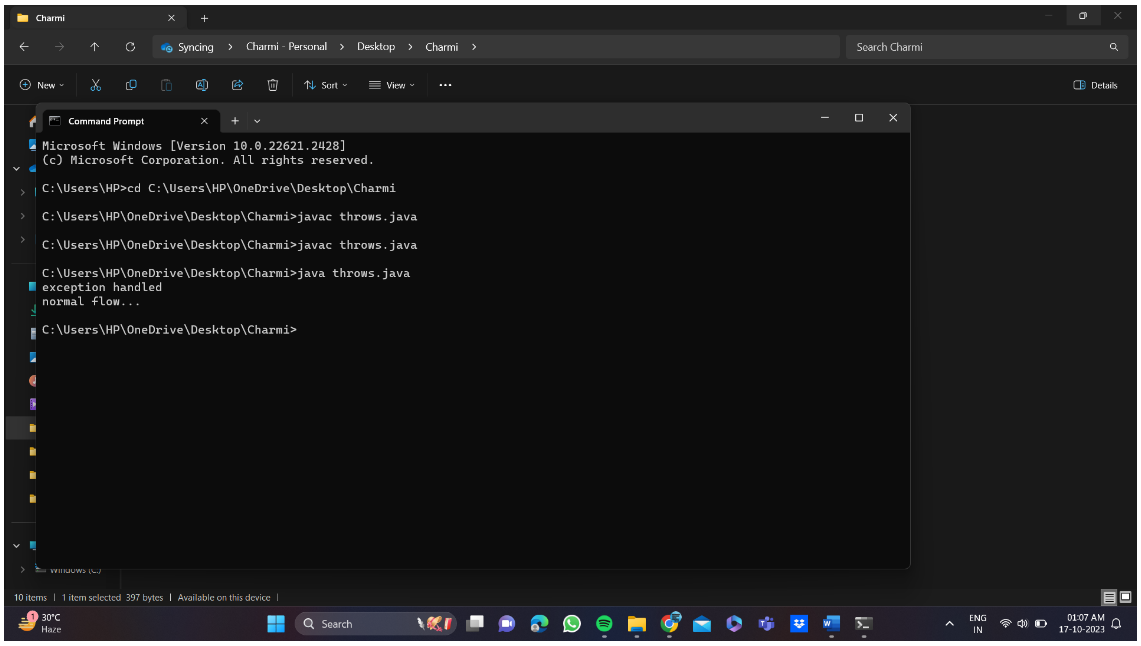

3}throws

```
import java.io.IOException;
 class Testthrows2{
   public static void main(String args[]){
    try{
     M m=new M();
     m.method();
    }catch(Exception e){System.out.println("exception handled");}

    System.out.println("normal flow...");
  }
}
class M {
    void method() throws IOException {
        throw new IOException("device error");
    }
}
```



```
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C:\Users\HP>cd C:\Users\HP\OneDrive\Desktop\Charmi

C:\Users\HP\OneDrive\Desktop\Charmi>javac throws.java

C:\Users\HP\OneDrive\Desktop\Charmi>javac throws.java

C:\Users\HP\OneDrive\Desktop\Charmi>java throws.java
exception handled
normal flow...

C:\Users\HP\OneDrive\Desktop\Charmi>
```
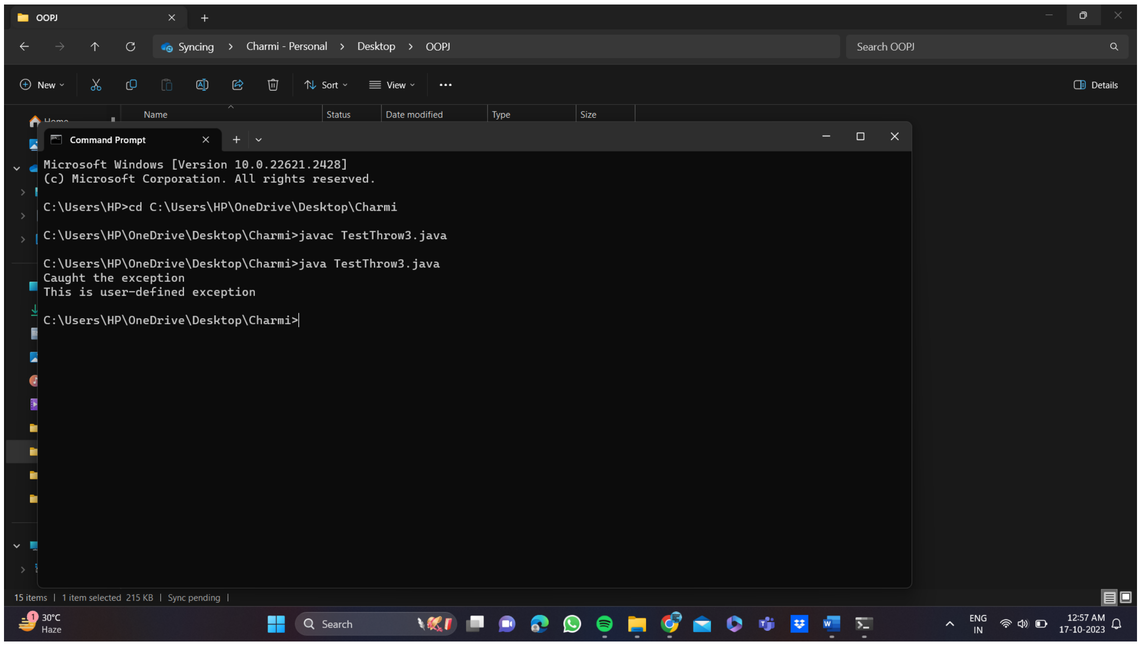

4} throw

```
 class TestThrow3
{
   public static void main(String args[])
   {
       try
       {
           throw new UserDefinedException("This is user-defined exception");
       }
       catch (UserDefinedException ude)
       {
           System.out.println("Caught the exception");
           System.out.println(ude.getMessage());
       }
   }
}
class UserDefinedException extends Exception
{
   public UserDefinedException(String str)
   {
       super(str);
   }
}
```



```
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(c) Microsoft Corporation. All rights reserved.

C:\Users\HP>cd C:\Users\HP\OneDrive\Desktop\Charmi

C:\Users\HP\OneDrive\Desktop\Charmi>javac TestThrow3.java

C:\Users\HP\OneDrive\Desktop\Charmi>java TestThrow3.java
Caught the exception
This is user-defined exception

C:\Users\HP\OneDrive\Desktop\Charmi>
```

Conclusion:

Comment on how exceptions are handled in JAVA.

In Java, the process of managing exceptions involves employing a combination of specific keywords, namely try, catch, finally, and throw. Exception handling is a fundamental practice in Java programming, enabling you to gracefully address runtime errors and ensure the robustness and dependability of your applications.

Try-Catch Blocks (try and catch):

The central technique for exception handling is the use of try-catch blocks. Any code segment that might trigger an exception is enclosed within a try block. Subsequently, one or more catch blocks are provided to deal with distinct types of exceptions that might be thrown.

Finally Block (finally):

Supplementary to the try-catch construct, you can employ a finally block. The code enclosed within the finally block executes unconditionally, regardless of whether an exception occurred or not. It is frequently utilized for post-execution cleanup tasks, such as resource release.

Throwing Exceptions (throw):
The throw keyword permits you to explicitly generate and throw exceptions from your code. This action is typically taken when your program encounters an exceptional circumstance beyond its control, necessitating the transfer of control to an appropriate exception handler.