

COMP 6481

Tutorial 3:

Exception Handling + Review

What is Exception

- ▶ Condition that has occurred in a piece of code
- ▶ Java provides a handling mechanism for Exception by creating different types of objects which describes the cause of exception
- ▶ Exception comes as an object
- ▶ All the Exceptions are instances of Throwable or it's classes down the hierarchy
- ▶ New Exception class can be created by extending Exception

Exception handling

- ▶ Try, catch, throw, throws, finally
- ▶ Exception raised in try, can be caught by catch block.
- ▶ finally will always be executed

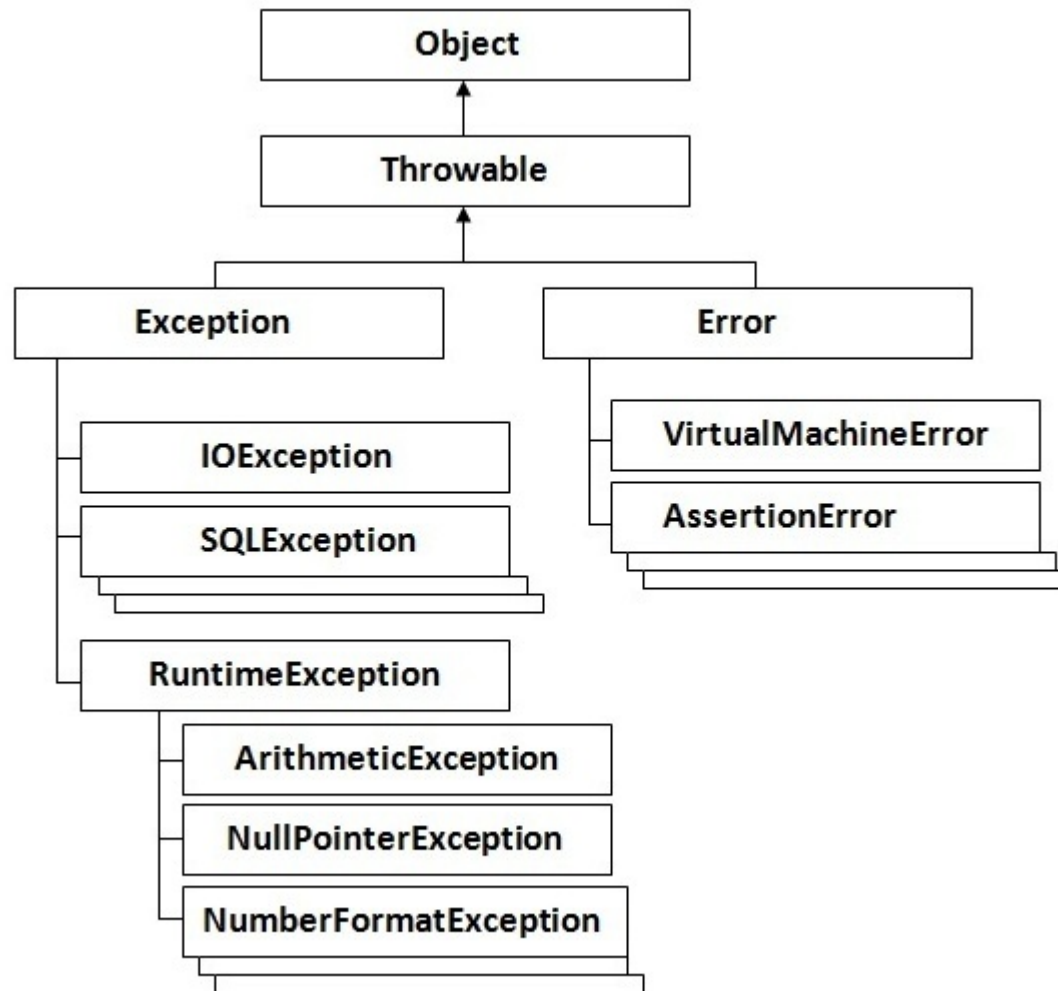
```
try{
    //code
}catch(ExceptionType e1) {
    //Flow 1
}catch(ExceptionType e2){
    //Flow 2
} finally{
    //close file
    //close database connection
    //close network socket
}
```

Powerful catch

- ▶ Exception or any such parent catch block allows Exception to be caught of any child type as well.

```
try{  
    //code  
}catch(Exception e1) {  
    //Flow 1  
}
```

Exception hierarchy



Types

- ▶ Checked - Checked at compile time. The classes that extends the Throwable except RuntimeException and Error.
- ▶ Unchecked - Checked at runtime. Classes extending RuntimeExceptions.
- ▶ Error - Can not be recovered. Eg. OOM

Question 1

Match each situation in the first column with an item in the second column.

- | | |
|--|---------------------|
| 1. <code>int[] A;</code>
<code>A[0] = 0;</code> | 1.Error |
| 2. The Java VM starts running your program, but the VM can't find the Java platform classes. (The Java platform classes reside in <code>classes.zip</code> or <code>rt.jar</code> .) | 2.checked exception |
| 3. A program is reading a stream and reaches the end of stream marker. | 3. Compile Error |
| 4. Before closing the stream and after reaching the end of stream marker, a program tries to read the stream again. | 4.no exception |

Question 2

Match each situation in the first column with an item in the second column.

- | | |
|---|---|
| 1. <code>int a = 30, b = 0;</code>
<code>int c = a/b;</code> | 1. <code>NullPointerException</code> |
| 2. <code>String a = null;</code>
<code>System.out.print(a.charAt(0));</code> | 2. <code>ArrayOutOfBoundsException</code> |
| 3. <code>int num = Integer.parseInt("XYZ");</code>
<code>System.out.print(num);</code> | 3. <code>ArithmeticException</code> |
| 4. <code>int array[] = new int[5];</code>
<code>array[6] = 9;</code> | 4. <code>NumberFormatException</code> |

Question 3

Modify the following cat method so that it will compile:

```
public static void cat(File named) {  
    RandomAccessFile input = null;  
    String line = null;  
    try {  
        input = new RandomAccessFile(named, "r");  
        while ((line = input.readLine()) != null) {  
            System.out.println(line);  
        }  
        return;  
    } finally {  
        if (input != null) {  
            input.close();  
        }  
    }  
}
```

Question 4

Modify the following method so that it will compile:

```
package data;

import java.io.File;
import java.io.IOException;
import java.sql.SQLException;

public class BadIO {
    public static void cat(File named) {
        BadIO obj_IO = new BadIO();

        try{
            obj_IO.fileBlowUp();
            obj_IO.databaseBlowUp();
        } //INSERT CODE HERE
    }

    void databaseBlowUp() throws SQLException {
        throw new SQLException();
    }

    void fileBlowUp() throws IOException {
        throw new IOException();
    }
}
```

Question 5

What is the output of the following program?

```
class Base {
    public void print() {
        System.out.println("Base");
    }
}
class Derived extends Base {
    public void print() {
        System.out.println("Derived");
    }
}
class Main{
    public static void doPrint( Base o ) {
        o.print();
    }
    public static void main(String[] args) {
        Base x = new Base();
        Base y = new Derived();
        Derived z = new Derived();
        doPrint(x);
        doPrint(y);
        doPrint(z);
    }
}
```

Question 6

What are the errors in the following program and how they can be fixed ?

```
public class A {  
    private int a = 100;  
    public void setA( int value) {  
        a = value;  
    }  
    public int getA() {  
        return a;  
    }  
}  
  
    public class OOPExercises {  
        public static void main(String[] args) {  
            A objA = new A();  
            System.out.println("in main(): ");  
            System.out.println("objA.a = "+objA.a);  
            objA.a = 222;  
        }  
    }
```