# Exception (OHOHOH)

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# try-catch

```
1       try{
2         your_original_code();
3       }
4       catch(Exception e){
5         listen_to_complaint();
6       }
```

- when `your_original_code` "ohohoh", `listen_to_complaint` part will **handle** it

# try-catch

```
1        try{
2          line_1;
3          line_2;
4          line_3;
5        }
6        catch(Exception e){
7          line_4;
8          line_5;
9        }
```

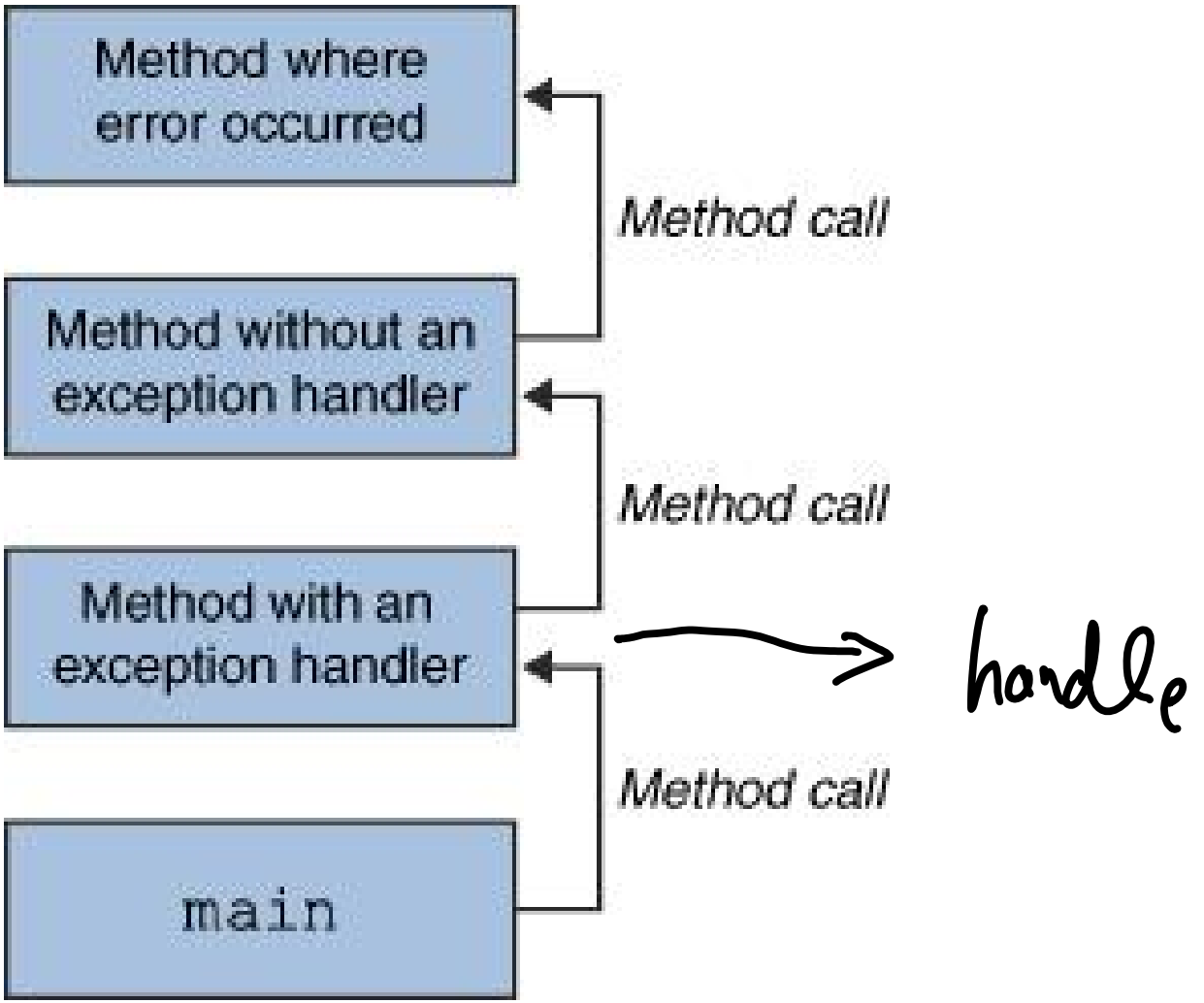
- when **exception** happens at line_1: [1], 4, 5
- when **exception** happens at line_2: 1, [2], 4, 5
- when **exception** happens at line_3: 1, 2, [3], 4, 5
- when **exception** happens at line_1 and line_4: [1], [4], ?

# try-throw-catch

```
1   try{
2     line_1;
3     line_2;
4     Exception e = new Exception("ohohohohohoh");
5     throw e;
6     //or throw new Exception("ohohohohohoh");
7     line_3;
8   }
9   catch(Exception e){
10    line_4;
11    line_5;
12  }
```

- if no other exception happens: 1, 2, 4, 5

# Exceptions in Method Calls (from Java Tutorial)



# try-throw-catch-catch

```
1   //class NullPointerException extends Exception
2   try{
3     line_1;
4     throw new Exception("ohohohohohoh");
5     line_2;
6   }
7   catch(NullPointerException n){
8     line_3;
9     line_4;
10  }
11  catch(Exception e){
12    line_5;
13  }
```

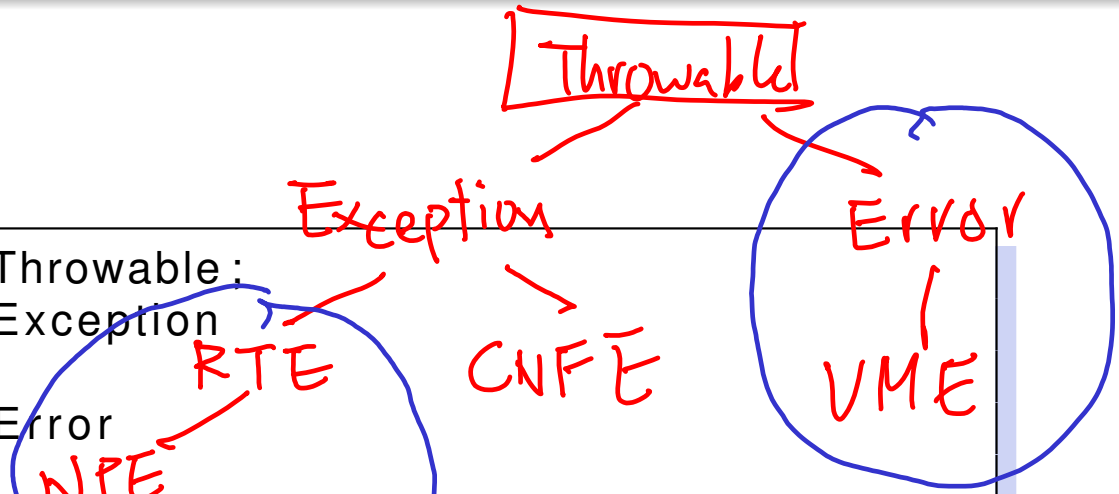
- if NPE happens at line 1: [1], 3, 4
- if Exception happens at line 1: [1], 5
- if no exception happens at line 1: 1, 5
- if exception happens at line 2? no way, compiler knows

# try-throw-catch-catch

```
1   try{
2     line_1;
3     throw new Exception("ohohohohohoh");
4     line_2;
5   }
6   catch(Exception e){
7     line_5;
8   }
9   catch(NullPointerException n){
10    line_3;
11    line_4;
12  }
```

- if NPE happens at line 1: [1], 5
- if Exception happens at line 1: [1], 5
- “need to catch more specific exceptions first” (hahaha if not)

# Exception Class Hierachy




```
1  public class java.lang.Throwable;
2  public class java.lang.Exception
3    extends Throwable;
4  public class java.lang.Error
5    extends Throwable;
6  public class java.lang.RuntimeException
7    extends Exception;
8  public class java.lang.NullPointerException
9    extends RuntimeException;
10 public class java.lang.ClassNotFoundException
11   extends Exception;
12 public abstract class java.lang.VirtualMachineError
13   extends Error;
```

# try-throw-catch-finally

```
1   try{
2     line_1;
3     throw new RuntimeException("ohohohohohoh");
4     line_2;
5   }
6   catch(NullPointerException e){
7     line_3;
8   }
9   catch(RuntimeException e){
10    line_4;
11  }
12  finally{
13    line_5;
14  }
```

- if NPE happens at line 1: [1], 3, 5
- if RTE happens at line 1: [1], 4, 5

What is the difference between the `finally` block and just putting lines afterwards?

# try-throw-catch-finally

```
1   try{
2     line_1;
3     throw new Exception("ohohohohohoh");
4     line_2;
5   }
6   catch(NullPointerException e){
7     line_3;
8   }
9   catch(RuntimeException e){
10    line_4;
11  }
12  finally{
13    line_5;
14  }
15  line_6;
```

- if NPE happens at line 1: [1], 3, 5, 6
- if nothing at line 1: 1, 5, caller-exception-handlers

# A More Complicated Example

```
1   for(int i = 0; i < 2; i++){
2     try{
3       System.out.println("try");
4       if (i > 0) throw new Exception();
5     }
6     catch(Exception e){
7       System.out.println("catch");
8       return; //continue? break?
9     }
10    finally{
11      System.out.println("finally");
12    }
13
14    System.out.println("afterwards");
15  }
```

# Putting It All Together (from Java Tutorial)

```
1   public void WriteList(){
2     PrintWriter out = null;
3
4     try {
5       System.out.println("try");
6       out = new PrintWriter(
7                   new FileWriter("output.txt");
8                   );
9       for(i=0;i<10;i++)
10        out.println(vector.elementAt(i));
11    }
12    catch (ArrayIndexOutOfBoundsException e){
13      System.out.println(e);
14    }
15    catch (IOException e){
16      System.out.println("IO Exception:" + e);
17    }
18    finally{
19      if (out != null)
20        out.close();
21    }
```

# throws

```
1   public double divide(int a, int b)
2     throws DivisionByZeroException
3   {
4     if (b == 0)
5       throw new DivisionByZeroException("...");
6   }
7
8   try{
9     divide(m, n);
10  }
11  catch(DivisionByZeroException e){
12  }
```

- "warn" the component user that an exception may be thrown
- compiler helps check if someone handles it (hahaha if not)
- what gets checked? everything other than RuntimeException and Error

# throws

```
1   public double divide(int a, int b)
2     throws DivisionByZeroException, LalalaException
3   {
4     if (b == 0)
5       throw new DivisionByZeroException("...");
6   }
7
8   public void caller() throws LalalaException{
9     try{
10      divide(m, n);
11    }
12    catch(DivisionByZeroException e){
13    }
14  }
```

- if the exception needs checking: caller needs to handle it (catch) or “warn” people (throws)