Types of Errors

Compile Time Error/Syntax errors

These are errors where the compiler finds something wrong with your program, and you can't even try to execute it.

For example, you may have incorrect punctuation, or may be trying to use a variable that hasn't been declared.

Syntax errors are the easiest to find and correct. The compiler will tell you where it got into trouble, and its best guess as to what you did wrong.

```
class PrintingSentence {
    public static void main(String args[])
    {
        String s = "GeeksforGeeks";

        // Missing ';' at the end
        System.out.println("Welcome to " + s)
    }
}
```

Runtime errors

If there are no syntax errors, Java may detect an error while your program is running. You will get an error message telling you the kind of error, and a **stack trace** that tells not only where the error occurred, but also what other method or methods you were in.

Runtime errors are intermediate in difficulty. Java tells you where it discovered that your program had gone wrong, but you need to trace back from there to figure out where the problem originated.

```
class RTErrorDemo {
    public static void main(String args[])
    {
        int arr[] = new int[5];

        // Array size is 5
        // whereas this statement assigns

        // value 250 at the 9th index
        arr[9] = 250;

        System.out.println("Value assigned! ");
    }
}
```

RunTime Error in java code:

```
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: 9
    at RTErrorDemo.main(File.java:10)
```

Logic errors

A logic error, or **bug**, is when your program compiles and runs, but does the wrong thing. The Java system, of course, has no idea what your program is *supposed* to do, so it provides no additional information to help you find the error.

```
class LogicalError {
    public static void main(String args[]){
        int a = 10;

            // if the number is less than 0, the number is negative
         if(a<0){
             System.out.println("The number is positive");
         }
    }
}
```