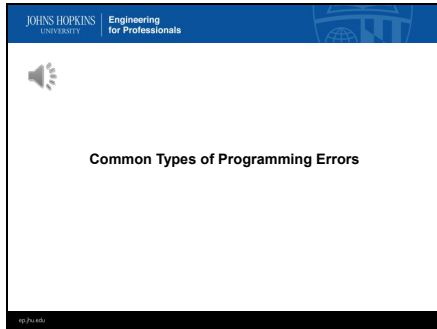
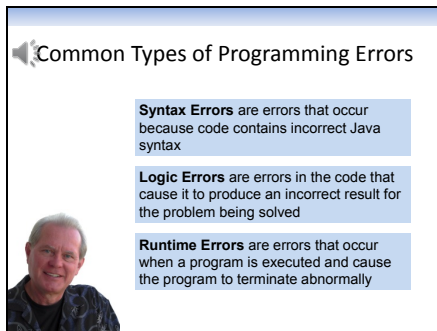


1



In this lecture you will learn about three basic types of programming errors.

2



There are three common types of programming errors experienced by Java programmers...syntax errors, logic errors, and runtime errors.

Syntax errors are errors that occur because the code contains incorrect Java syntax. Examples of syntax errors include writing a programming statement that does not follow Java rules...or...perhaps referencing a Java class that does not exist.

If a program has a syntax error it will not compile and therefore will not be able to be executed until the syntax error is corrected.

Logic errors are errors in the code that cause the program to produce an incorrect result for the problem it is supposed to solve. The program runs and terminates normally but the results are not correct. An example of a logic error might be coding an incorrect formula for a computation.

Runtime errors are errors that occur when a program is executed and which cause a program to terminate abnormally.

Runtime errors often occur because the programmer didn't anticipate and check for specific conditions.

An example of a runtime error would be a programming statement that divided an expression by a number that had a zero value.

3

### Syntax Errors

This program has a **syntax error**. The semicolon that is needed to terminate the `System.out.println()` statement is missing.

```
public class SyntaxErrorDemo1
{
    public static void main( String [] args )
    {
        int x = 10;
        System.out.println( "The value of x is " + x )
    }
}
```

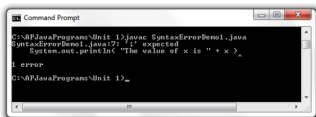
This program has a syntax error...can you find it?  
(pause)

The semicolon is missing from the  
`System.out.println()` statement.

Let's see what happens when we try to compile the  
program.

4

### Command Line Syntax Errors



```
C:\AF\JavaPrograms>cd C:\AF\JavaPrograms\SyntaxErrorDemo1
C:\AF\JavaPrograms\SyntaxErrorDemo1>javac SyntaxErrorDemo1.java
SyntaxErrorDemo1.java:7: error:
  System.out.println( "The value of x is " + x )
  error:
C:\AF\JavaPrograms\SyntaxErrorDemo1>
```

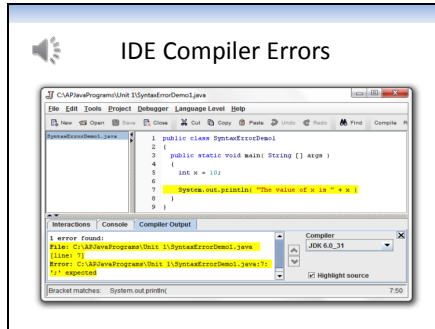
I went ahead and compiled the  
program from the command line...and  
this was the resulting output.

Notice that the error message  
explained that there was a syntax error  
and also provided the line number that  
it thinks the error is located on, as well  
as a display of the programming  
statement and where it thinks the error  
is located on that statement.

Now...syntax errors won't always be  
this clear...but they will at least give you  
a good hint about what the problem  
appears to be.

In order to fix this problem we have to  
back to our source code, find line 7,  
and provide the correct syntax.

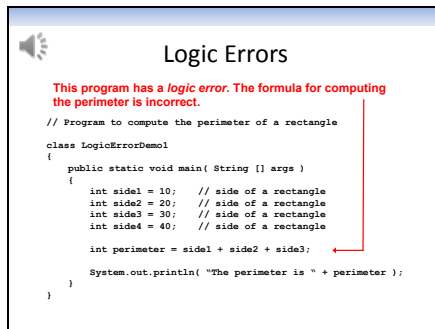
5



Here's what happens when I compile the program using the DrJava IDE.

Notice how the DrJava tool gives a description of the error as well as highlights the actual programming statement where the error occurs. This makes it a lot easier to find and correct the syntax error...compared to compiling from the command line.

6

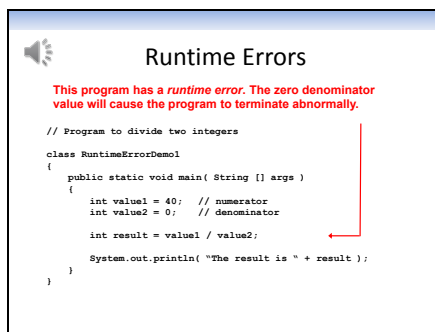


This program contains a logic error...can you find it??

The logic error is that the formula for computing the perimeter is incorrect. The formula takes the sum of only three of the four sides. The correct formula would be to sum all four sides.

This program would certainly run...and produce an output...but the output would be incorrect.

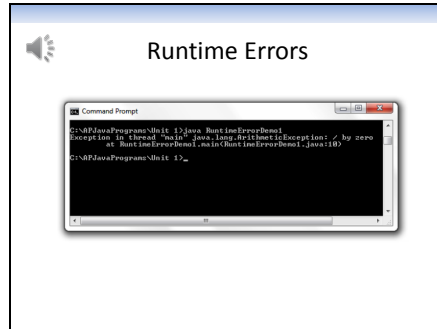
7



This program contains a runtime error.

The value of the denominator is zero...and dividing something by zero will cause a program to terminate abnormally.

8

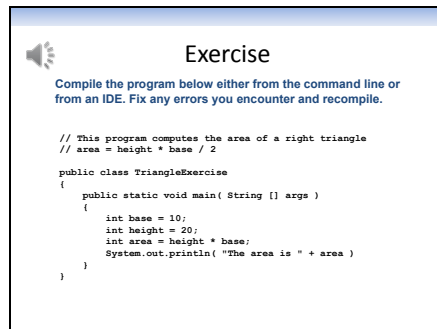


If we compile the program used in the last example...it will compile correctly.

The problem...that is...the runtime error...occurs when we execute the program as can be seen here.

Because of the runtime error the program terminates abnormally.

9



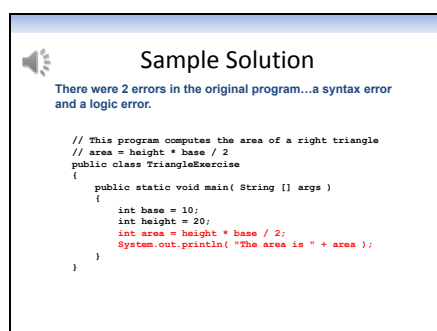
At this point I'd like you to do a short exercise.

I'd like you to compile this program either from the command line or from an IDE and examine the result.

If you find any errors, please fix them so that the program compiles and runs correctly.

Please pause this lecture now...and resume it once you have completed the exercise.

10



Hopefully, you found that the original program had two errors.

There was one syntax error...the semicolon for the `System.out.println()` method call was missing...and there was one logic error...the formula for the area was programmed incorrectly.

