



# CMSC 131

Fall 2018

# Runtime Errors

## Examples of Runtime Errors

Let's consider a concrete case:

**Example:** `TriangleAreaCalculator.java`

What could go wrong here?

What should be done?

- Error message and terminate?
- Return an “error code”?
- “Throwing an exception”.

# Exceptions

- What is an “exception”?

In Java:

1. When something unexpected occurs, we “throw” an exception
    - Demonstrate with TriangleCalculator.java
  2. JVM looks for “handler”
    - Looks in current method. If not found, pops this frame off the call stack and looks in the next one. Etc.
- If “handler” is found it runs.
- If “handler” is never found, program terminates.

# How does a “Handler” Look?

```
try {  
    <Code that might throw an exception>  
} catch(ExceptionClass e) {  
    <Put handler here>  
}
```

# Common Types for Exceptions

- NullPointerException
- ArithmeticException
- IllegalArgumentException
- RuntimeException (plain vanilla one)
- Many others
- You can create your own!

# Examples

- `TriangleArea.java`
- `findCalories.java`
- `TryCatchExample.java`
- `ExceptionExamples.java`

# Observations

Where are exceptions thrown?

- In code you have written
- In code written by someone else that you are calling
- By the JVM itself, internally

Why is this better than just returning an “error code”?