

CHANGE THE WORLD FROM HERE

Exception Handling CS 272 Software Development

Credit: Professor Sophie Engle Department of Computer Science

Java Exception Handling

- Program can operate even if exceptions occur
 - Warn and continue, or terminate gracefully \bigcirc
- Allows for grouping of types of exceptions
- Separates exception handling logic from normal igodolfunctionality

https://docs.oracle.com/javase/tutorial/essential/exceptions/advantages.html

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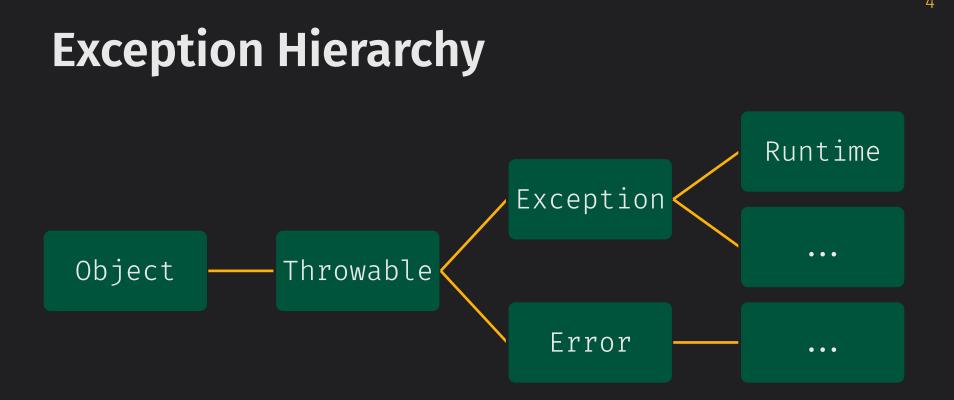
Types of Exceptions

Туре	Description	Catch/Throw?
Error	Problem occurred external to application (in the JVM)	Not Usually
Runtime Exception	Programs cannot anticipate or recover from, usually a bug	Optional
Checked Exception	Programs should anticipate and recover from	Required

https://docs.oracle.com/javase/tutorial/essential/exceptions/catchOrDeclare.html

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https://docs.oracle.com/javase/tutorial/essential/exceptions/throwing.html

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Errors

- Indicate a serious problem external to program (in the JVM) occurred
- Usually not addressed by simple programs igodol
- For example, an **IOError** from hard drive failure while reading an open file

https://docs.oracle.com/javase/tutorial/essential/exceptions/throwing.html

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Runtime Exceptions

- Includes all Exception subclasses under **RuntimeException**
- Can be caught or thrown, but not required
- Often indicates code defects
 - e.g. accessing an array out of bounds \bigcirc

https://docs.oracle.com/javase/tutorial/essential/exceptions/catchOrDeclare.html

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Common Runtime Exceptions

- ArithmeticException
- IndexOutOfBoundException
 - o ArrayIndexOutOfBoundsException
 - StringIndexOutOfBoundsException
- NegativeArraySizeException
- NullPointerException

https://www.cs.usfca.edu/~cs272/javadoc/api/java.base/java/lang/RuntimeException.html

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Checked Exceptions

- Includes all Exception subclasses except those under RuntimeException
- Should be anticipated by programmer
- Must be handled by application
 - e.g. trying to open an non-existent file

https://docs.oracle.com/javase/tutorial/essential/exceptions/catchOrDeclare.html

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Common IO Exceptions

- EOFException
- FileNotFoundException
- FileSystemException
- NoSuchFileException
- CharacterCodingException
- MalformedInputException

https://www.cs.usfca.edu/~cs272/javadoc/api/java.base/java/io/IOException.html

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Handling Checked Exceptions

- Use **try**, **catch**, **finally** blocks to handle
- Use **try**-with-resources blocks
 - Added in Java 7 to auto-close resources
- Use **throws** keyword and **catch** elsewhere
 - Catch where makes sense to handle exception



Catching Exceptions

- Any exception type (even unchecked) can be caught
- Can specify multiple catch blocks for each try
 - Will execute first matching catch block
- Related to inheritance, discussed more later
- Can catch more than one exception per handler
- Can throw exceptions within handlers



API Example

nextInt

public int nextInt()

Scans the next token of the input as an int.

An invocation of this method of the form nextInt() behaves in exactly the same way as the invocation nextInt(radix), where radix is the default radix of this scanner.

Returns:

the int scanned from the input

Throws:

InputMismatchException - if the next token does not match the Integer regular expression, or is out of range

NoSuchElementException - if input is exhausted

IllegalStateException - if this scanner is closed

https://www.cs.usfca.edu/~cs272/javadoc/api/java.base/java/util/Scanner.html#nextInt()

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Questions?

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