File I/O

CSE 114 INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING

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Announcements

Today: Exception handling, file I/O

Reading assignment for this slide set: the lecture notes

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Exception handling

Java uses a try-catch block to handle exceptions

Exceptions are events that occur during the execution of programs that disrupt the normal flow of instructions (e.g., divide by zero, array access out of bound, etc.).

In **Java**, an **exception** is an object that wraps an error event that occurred within a method and contains: Information about the error including its type.

See Numbers.java
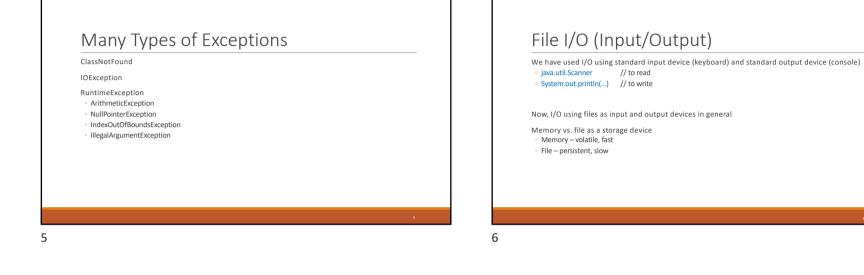
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Using Exceptions

Your own code can throw Exceptions intentionally

Let's consider an example where it is possible to divide by zero
◦ Without exceptions: see Quotient.java
◦ Without exceptions, but using a custom solution to avoid an error: see QuotientWithIf.java
◦ Without exceptions, but using a custom method to avoid an error: see QuotientWithMethod.java
◦ With proper exception handling: see QuotientWithException.java

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Many Types of Exceptions

ClassNotFound

IOException

RuntimeException
◦ ArithmeticException
◦ NullPointerException
◦ IndexOutOfBoundsException
◦ IllegalArgumentException

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File I/O (Input/Output)

We have used I/O using standard input device (keyboard) and standard output device (console)
◦ java.util.Scanner   // to read
◦ System.out.println(…)   // to write

Now, I/O using files as input and output devices in general

Memory vs. file as a storage device
◦ Memory – volatile, fast
◦ File – persistent, slow

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Basic concepts of a file

1. Open a file

2. Read from a file
   • The *'read pointer'* in an open file
   • Reading a byte, character, word, or line at the read pointer position

3. Write to a file
   • The *'write pointer'* in an open file
   • Writing a byte, character, word, or line at the write pointer position

4. Close a file

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Storing objects in an array

See Fio.java (run this program)

See people.in (input file used in Fio.java)

See people.out (output file generated by Fio.java)

See Student.java (class used by Fio.java)

See ArrayTools.java (class used by Fio.java)

Note: input and output file name extensions don't have to be .in and .out. We could have used .txt or others.

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