

File I/O

CSE 114 INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING

Announcements

Today: Exception handling, file I/O

Reading assignment for this slide set: the lecture notes

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](#)

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](#)

Many Types of Exceptions

ClassNotFoundException

IOException

RuntimeException

- ArithmeticException
- NullPointerException
- IndexOutOfBoundsException
- IllegalArgumentException

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

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

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.