JAC444 - Lecture 6

Java Input / Output

Segment 1- Basics

Objectives

Upon completion of this lecture, you should be able to:

- Examine Input / Output classes in Java
- Create and Use I/O Streams in Java
- Distinguish Byte, Character, and Buffered Stream
- Design and Develop File I/O programs

Input / Output

In this lesson you will be learning about:

- Types of Input / Output Stream
- Typical use of IO Streams
- Character and Byte Streams.

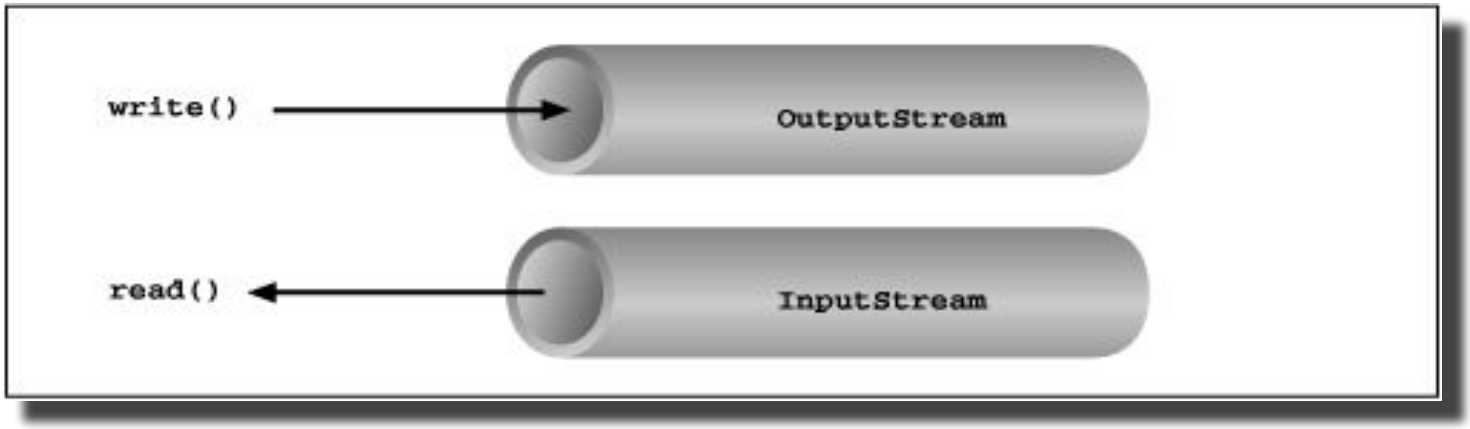
Reading / Writing Data

Reading

Open a stream
while more information
read information
close the stream

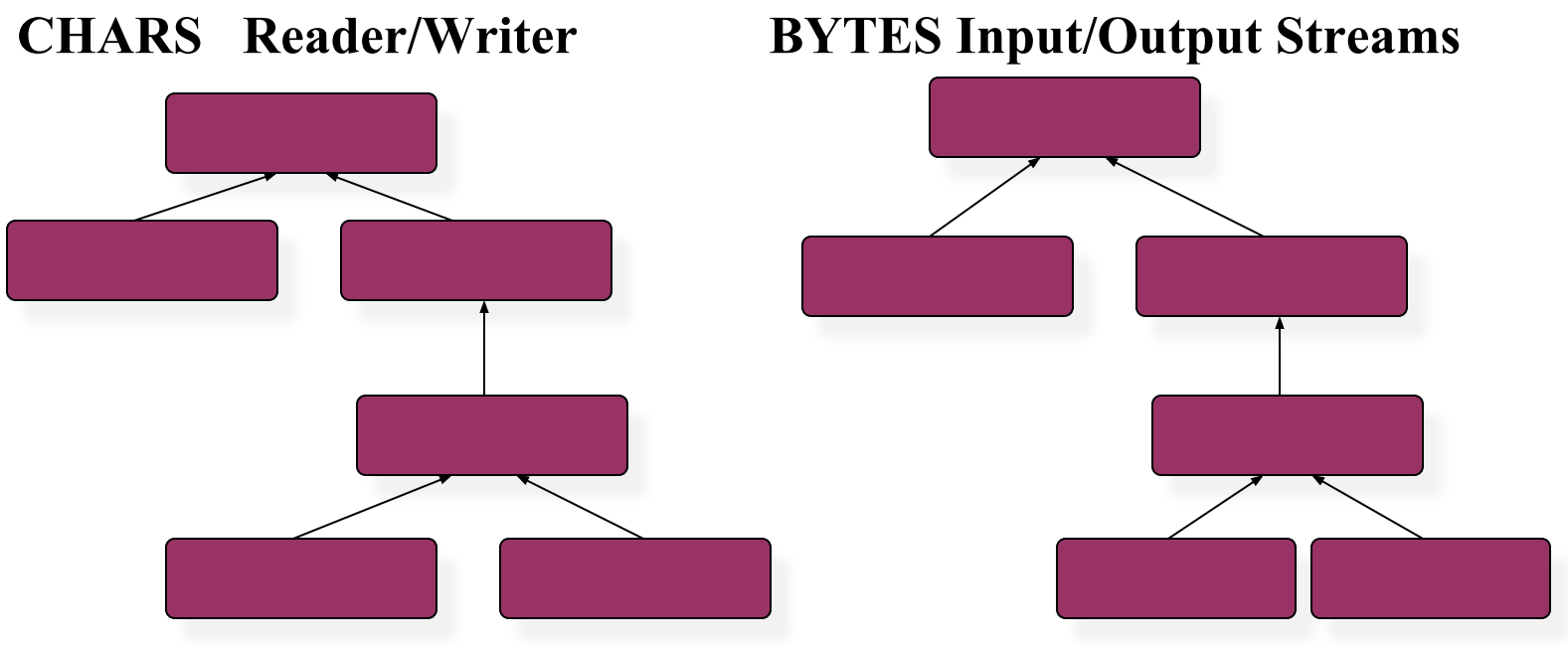
Writing

open a stream
while more information
write information
close the stream

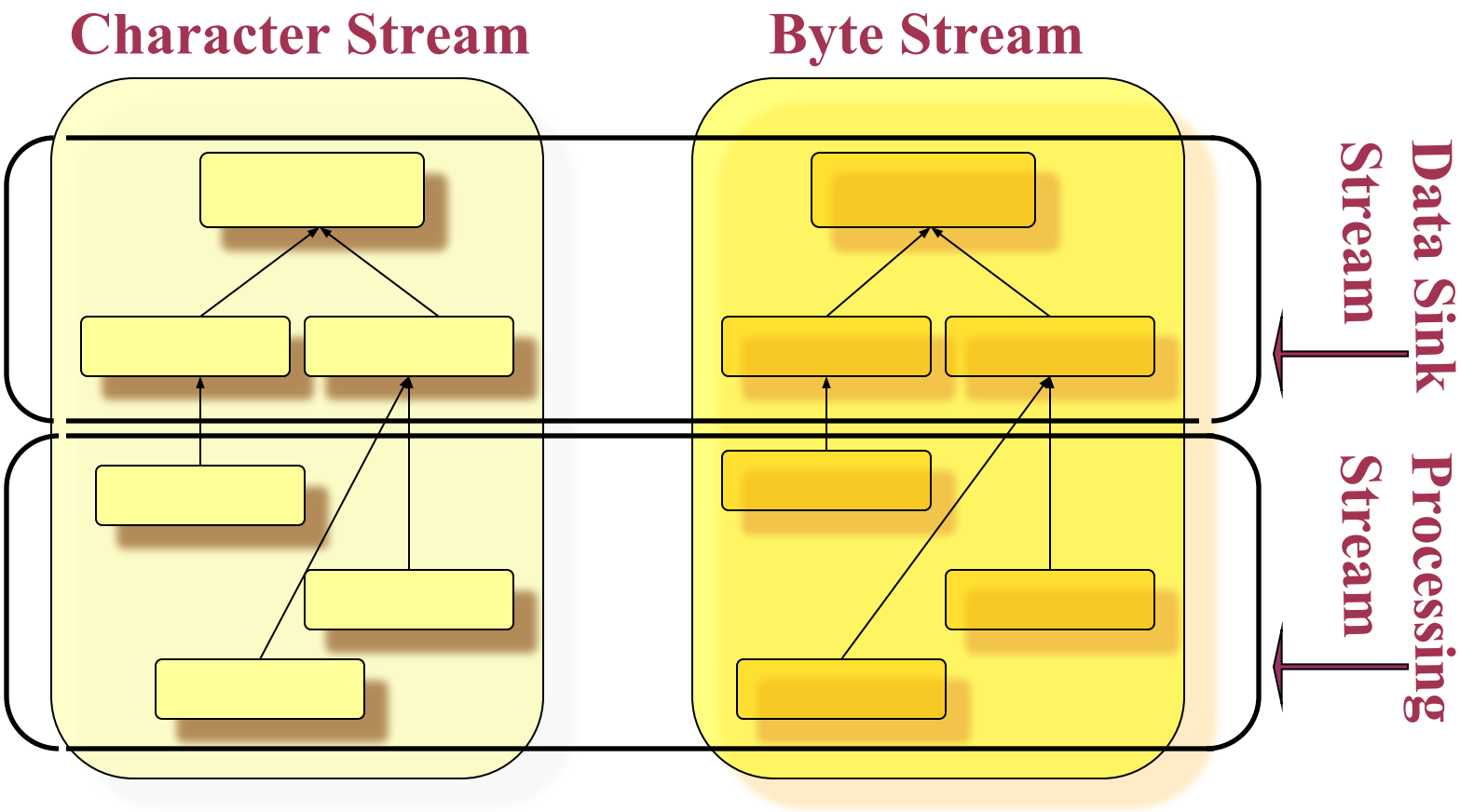


I/O Package

1. Contains a collection of classes that support I/O algorithms.
2. Classes are divided into two class hierarchies based on the data type o
   - `char`
   - `byte`



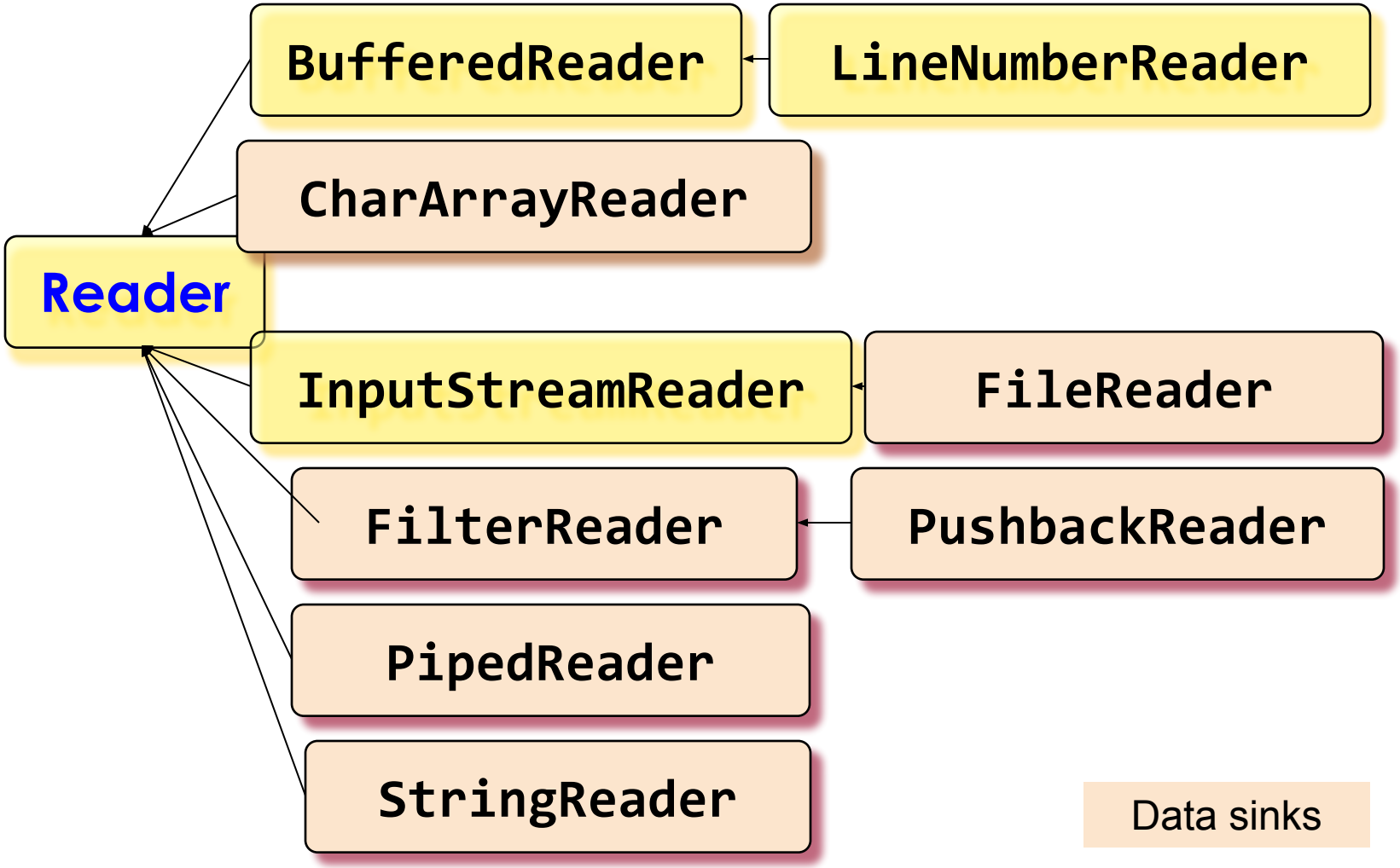
Logical Group of IO Classes



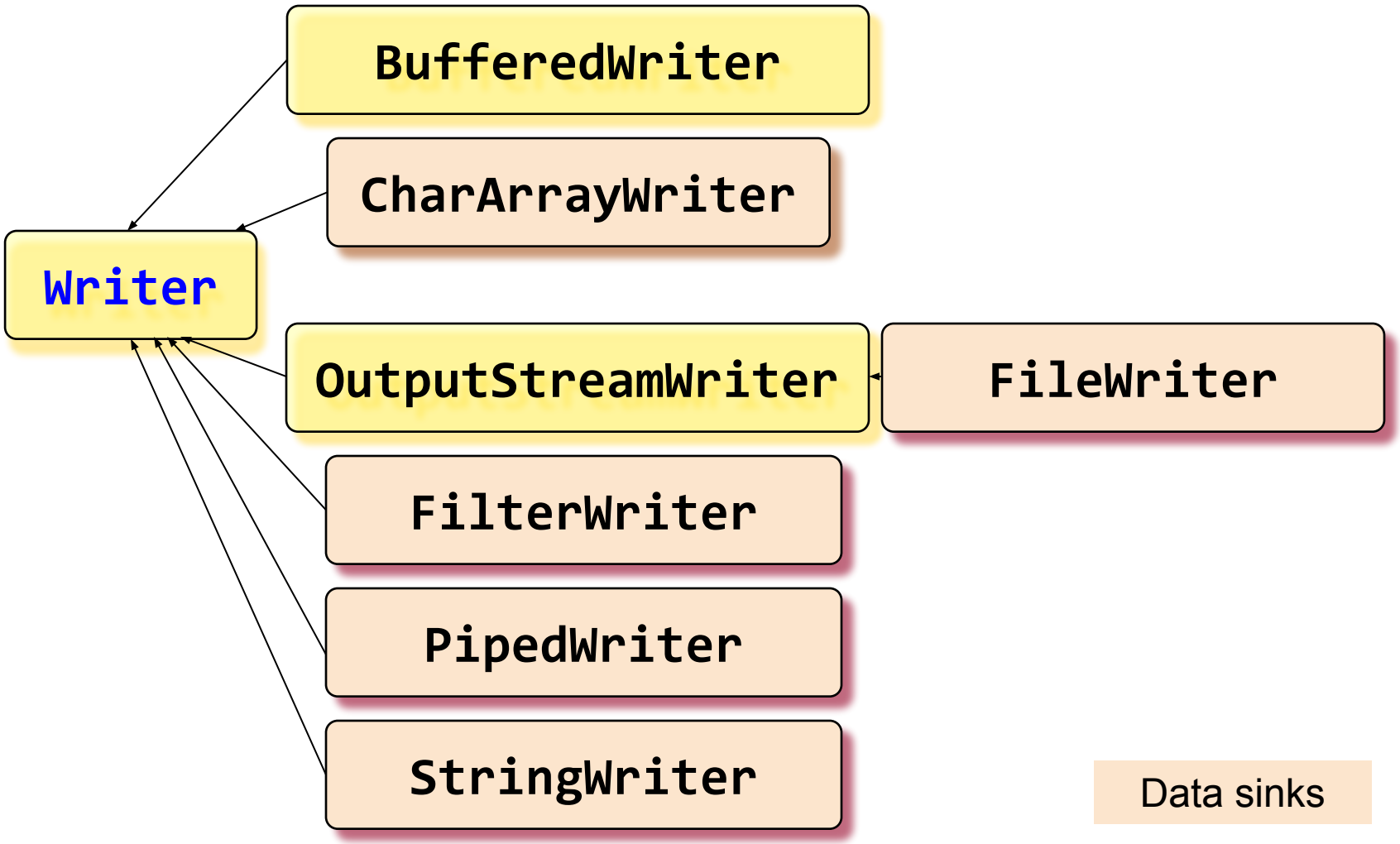
Character Stream

- **`Reader/Writer`** are abstract superclasses for character streams in **`java.io`** package.
- **`Reader`** Abstract class for reading character streams and provides methods for reading 16-bit characters.
- The only methods that a subclass must implement are **`read(char[],int, int)`** and **`close()`**.
- **`Writer`** Abstract class for writing to character streams and provides methods for writing 16-bit characters.
- The only methods that a subclass must implement are **`write(char[], int, int), flush(), and close()`**.

Reader


BufferedReader
LineNumberReader
CharArrayReader
Reader
InputStreamReader
FileReader
FilterReader
PushbackReader
PipedReader
StringReader
Data sinks

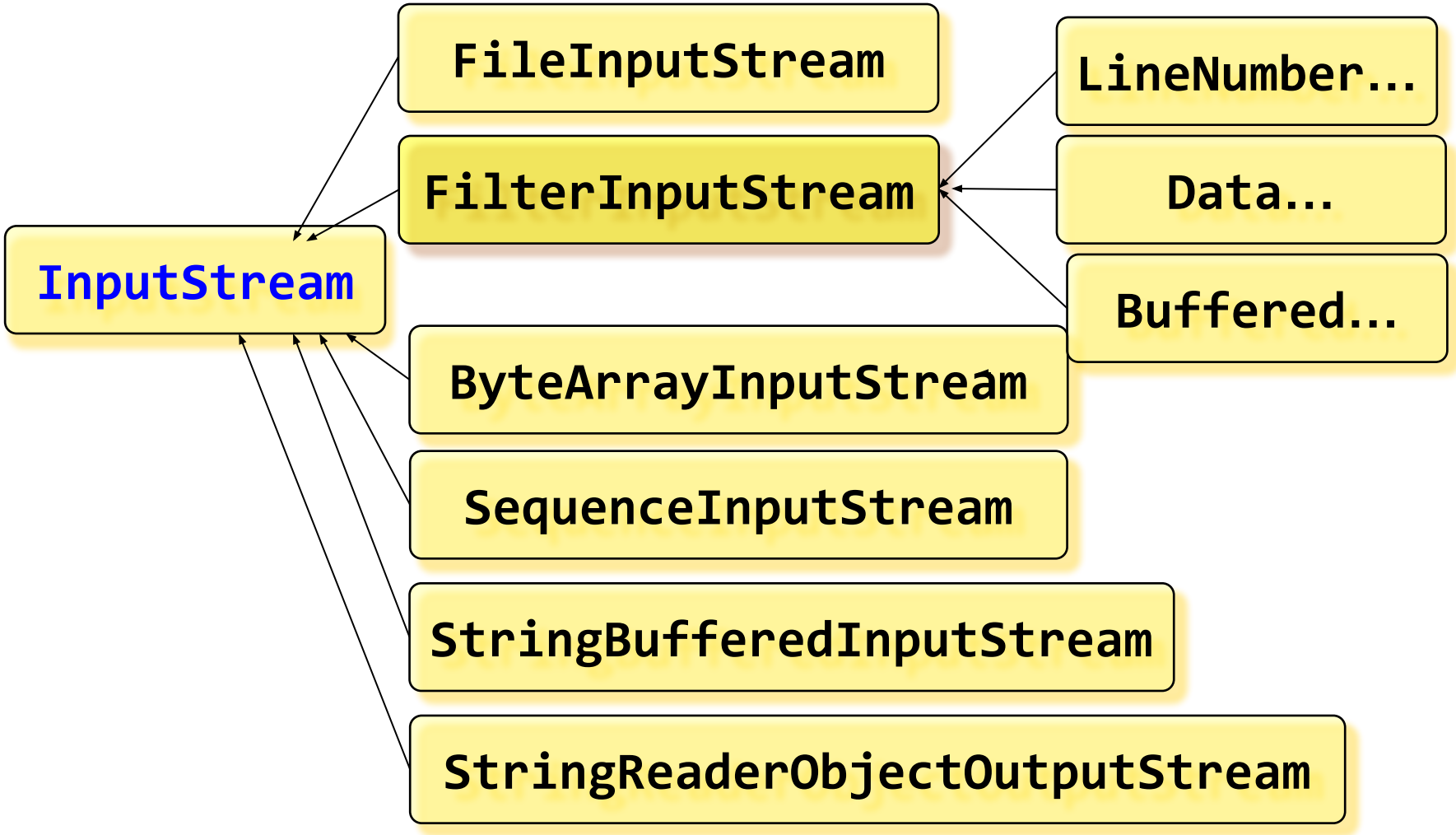
Writer


BufferedWriter
CharArrayWriter
Writer
OutputStreamWriter
FileWriter
FilterWriter
PipedWriter
StringWriter
Data sinks

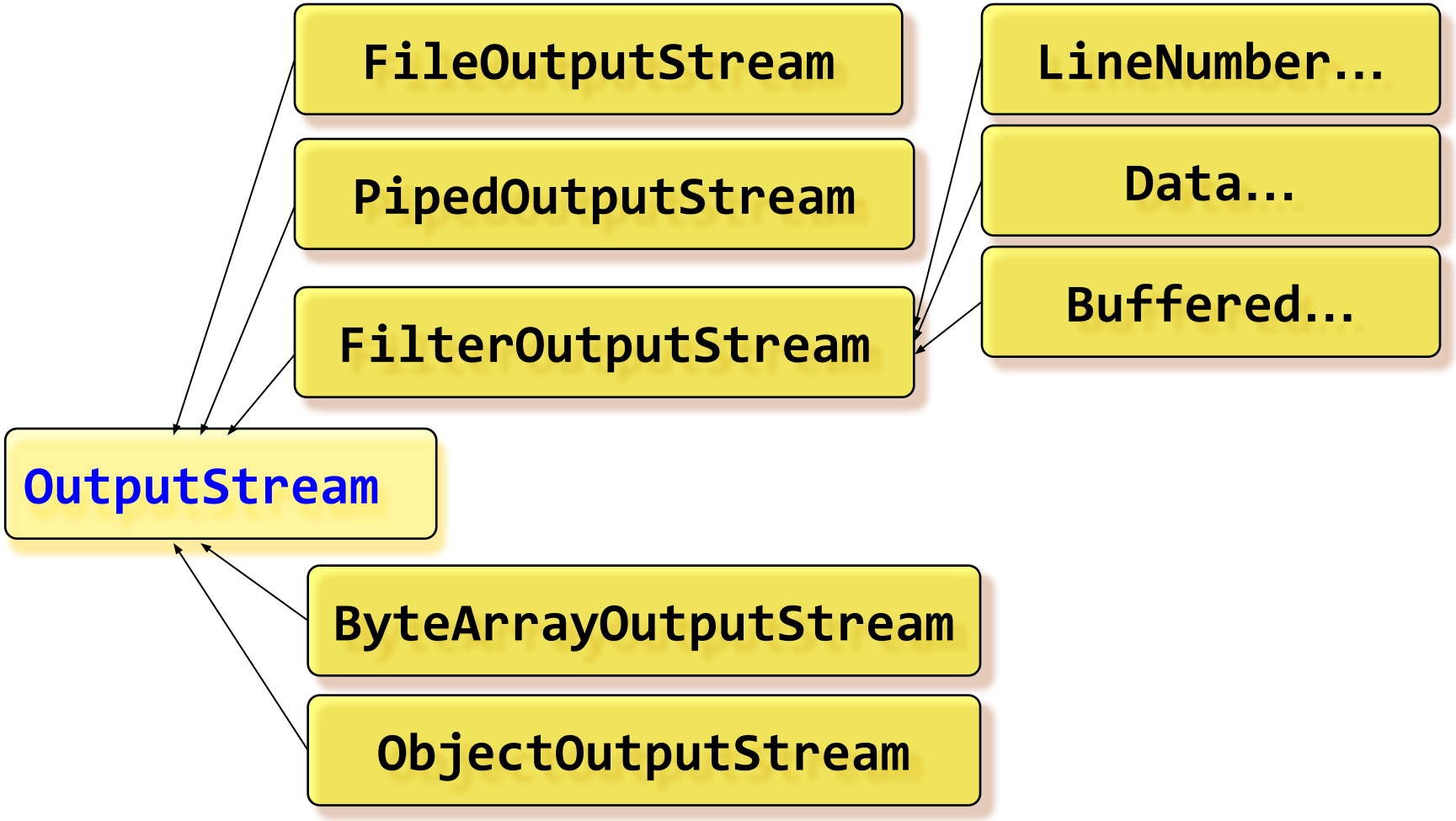
Byte Streams

- All byte stream classes are descended from **`InputStream`** and **`OutputStream`**
- **`InputStream`** and **`OutputStream`** provide the methods and some implementation for read and write 8 bit bytes.
- Streams are typically used to read and write binary data such images and sounds
- Input/Output subclasses provide specialized I/O for streams

Input Stream



Output Stream



Byte Stream Question

- **`InputStream`** and **`OutputStream`** provide the methods and some implementation for read and write 8 bit bytes.

- **`int read() throws IOException`**

  It returns: the next byte of data, or -1 if the end of the stream is reached

  Question: The value of a byte b is in the range `-128 <= b < 127`

  *When you invoke **`read`**() method and the returned value is -1, how do you know that this is the end of the stream or is the byte value from your stream*