

Reading and Writing Bytes



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Agenda



Introducing InputStream and OutputStream implementations

- basic operations
- opening and closing
- buffering and flushing
- readers and writers
- data and object streams

Reading Bytes and Buffering

Demo



Discovering concrete InputStream:

FileInputStream

ByteArrayInputStream



InputStream key points:

- an input stream must be closed
- exceptions may be thrown
- it can read bytes
- it may support marking
- bytes can be skipped

Writing Bytes and Buffering

Demo



Discovering concrete OutputStream:

FileOutputStream

ByteArrayOutputStream



OutputStream key points:

- it must be closed
- it can be flushed
- it can write bytes

Reading Characters from Bytes



Reading **and** writing characters **from** bytes:

- InputStreamReader **is a** Reader
- OutputStreamWriter **is a** Writer

An `InputStreamReader` is a `Reader`
that is built on an `InputStream`

An OutputStreamWriter is a Writer
that is built on an OutputStream

Demo



**InputStreamReader and
OutputStreamWriter in action!**



One key point:

InputStreamReader **and** OutputStreamWriter
both know their encoding

Writing and Reading Primitive Types

Demo



Streams of primitive types:

- **DataInputStream**
- **DataOutputStream**

Writing and Reading Objects

Demo



Streams of object:

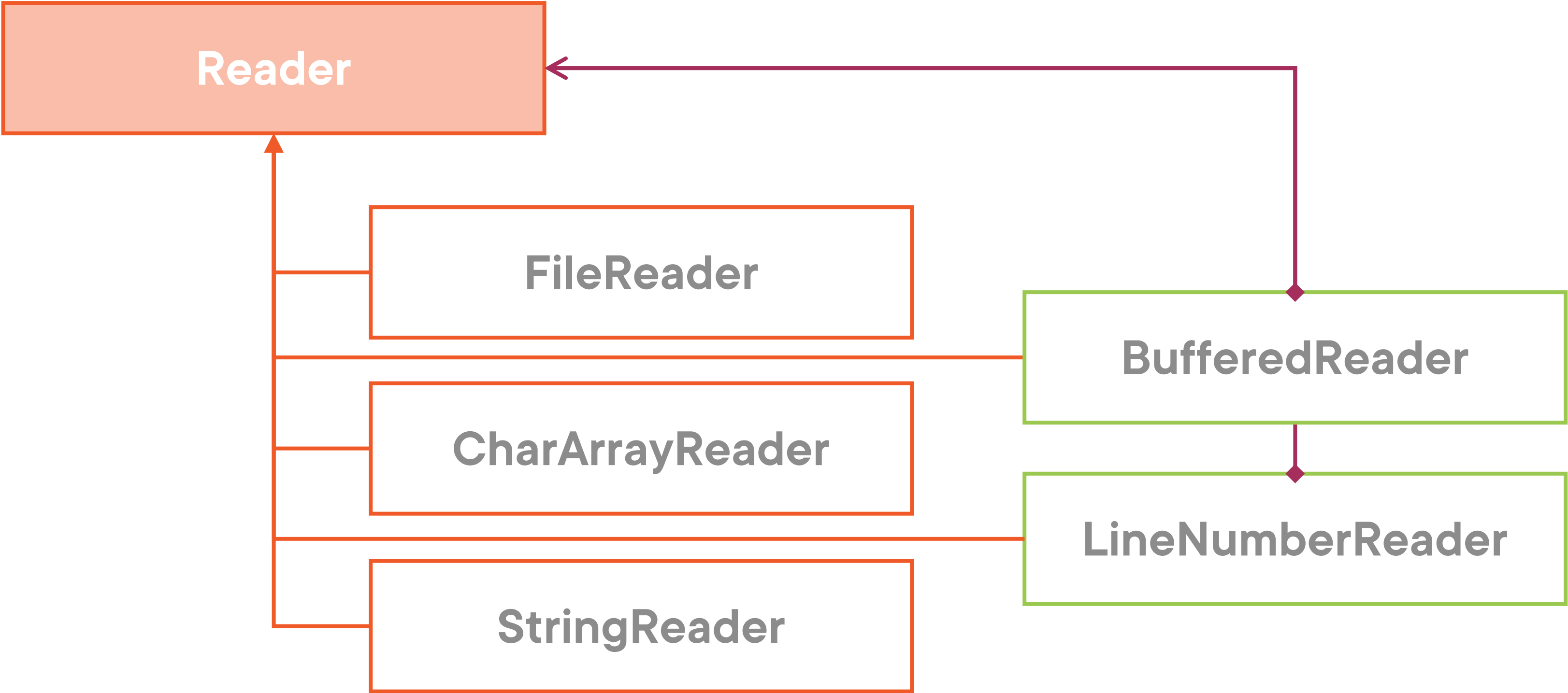
- **ObjectInputStream**
- **ObjectOutputStream**



Serialization key points:

- only Serializable objects can be written
- no method in Serializable
- a Serializable class can define a serialVersionUID
- deserializing an object may lead to partially reconstructed objects

Low Level and High Level Classes



Low level readers

High level readers

Java I/O Classes

Feature	Abstract Class	Low level implementation	High level implementation
Reading chars	Reader	FileReader CharArrayReader StringReader	BufferedReader LineNumberReader InputStreamReader
Writing chars	Writer	FileWriter CharArrayWriter StringWriter PrintWriter	BufferedWriter OutputStreamWriter
Reading bytes	InputStream	FileInputStream ByteArrayInputStream	BufferedInputStream DataInputStream ObjectInputStream
Writing bytes	OutputStream	FileOutputStream ByteArrayOutputStream PrintStream	BufferedOutputStream DataOutputStream ObjectOutputStream

Module Wrap Up



What did you learn?

Reading and writing bytes!

InputStream and OutputStream

Can be buffered

Streams of primitive types

Streams of objects, Serialization

Hybrid streams

Low level / high level classes

Up Next: Using the Console
