



# Java Programming I

*Session 9*

Streams

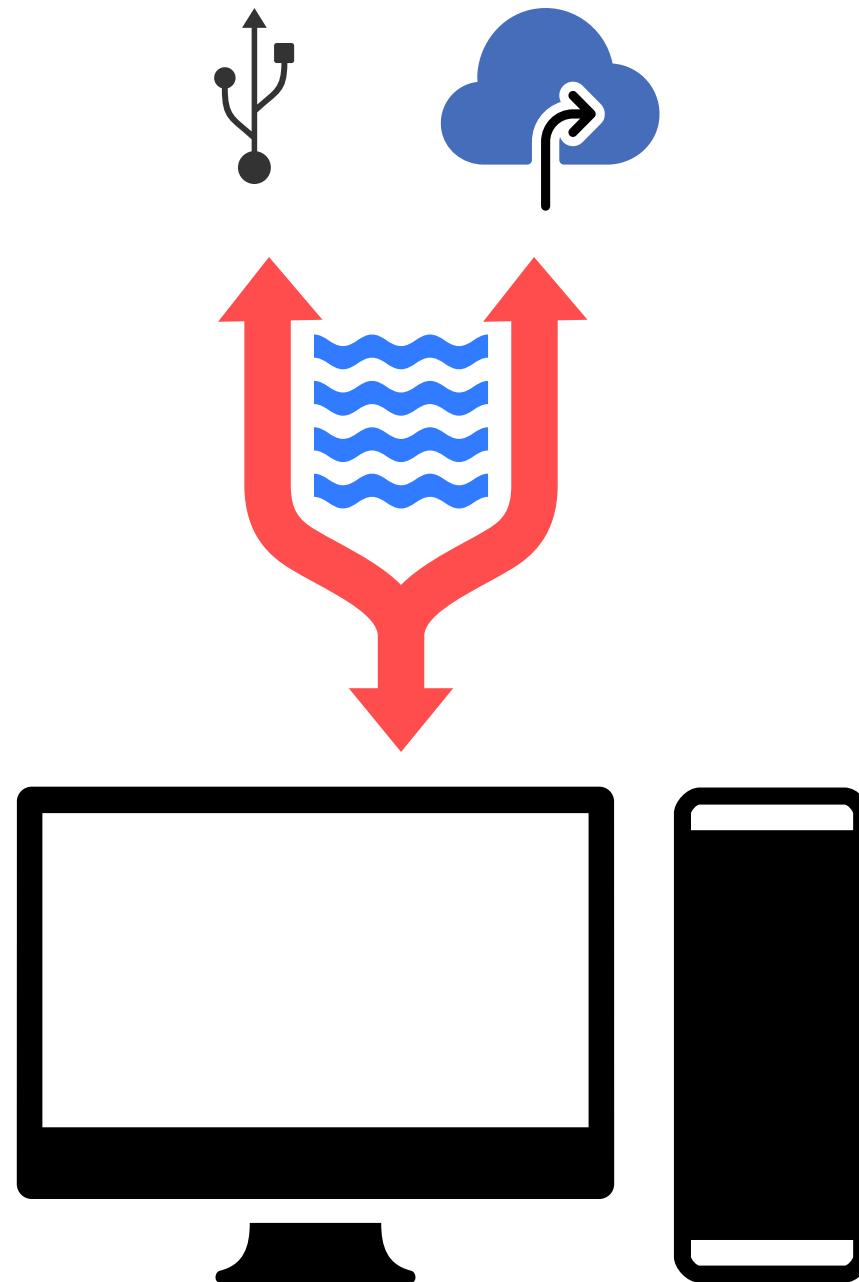
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# Agenda

- **Streams**
- **Byte vs Character Streams**
- **Usage**
- **I/O Example**
- **RandomAccessFile**

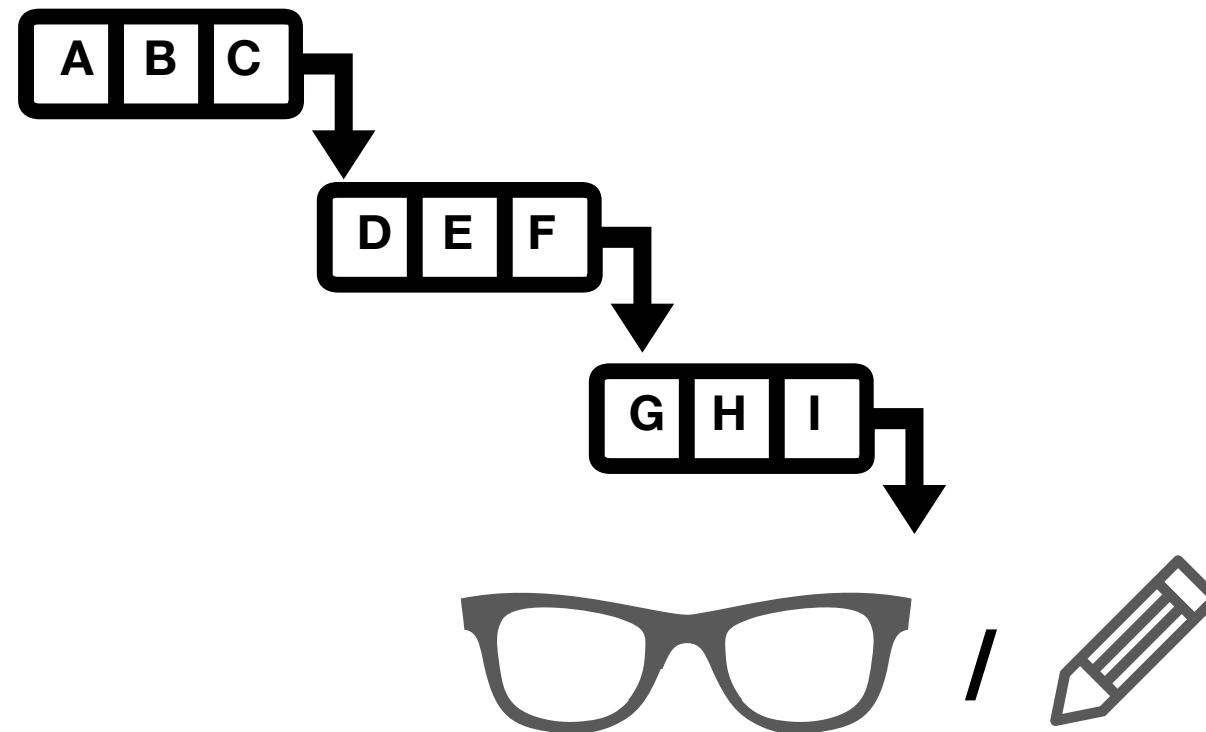
# Streams

Flowing I/O



# java.io

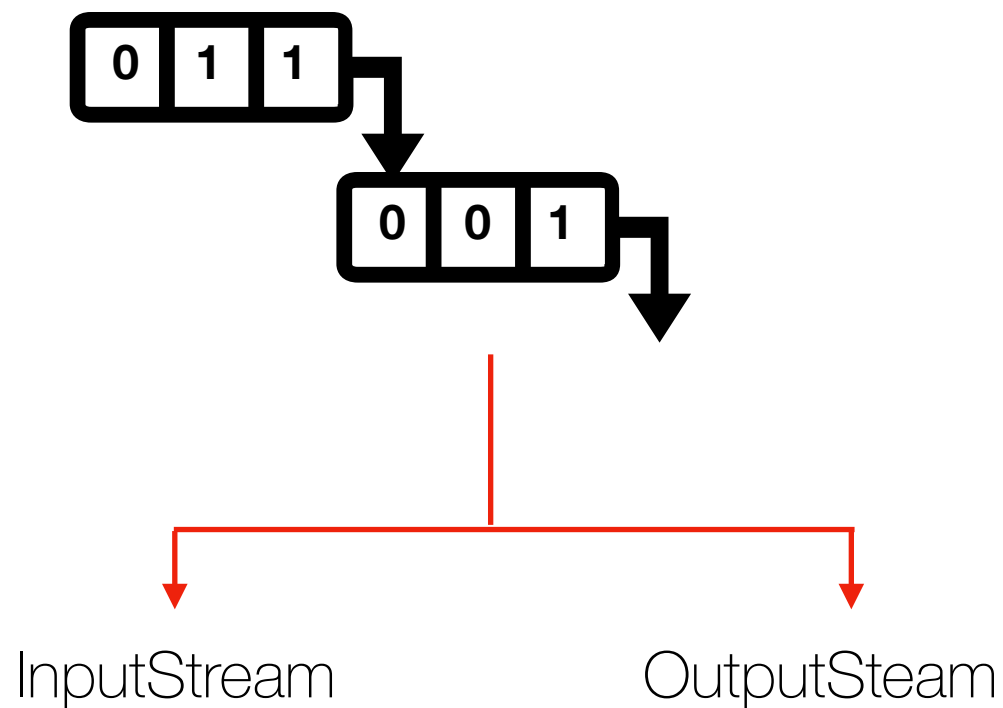
Read/Write while there's something...



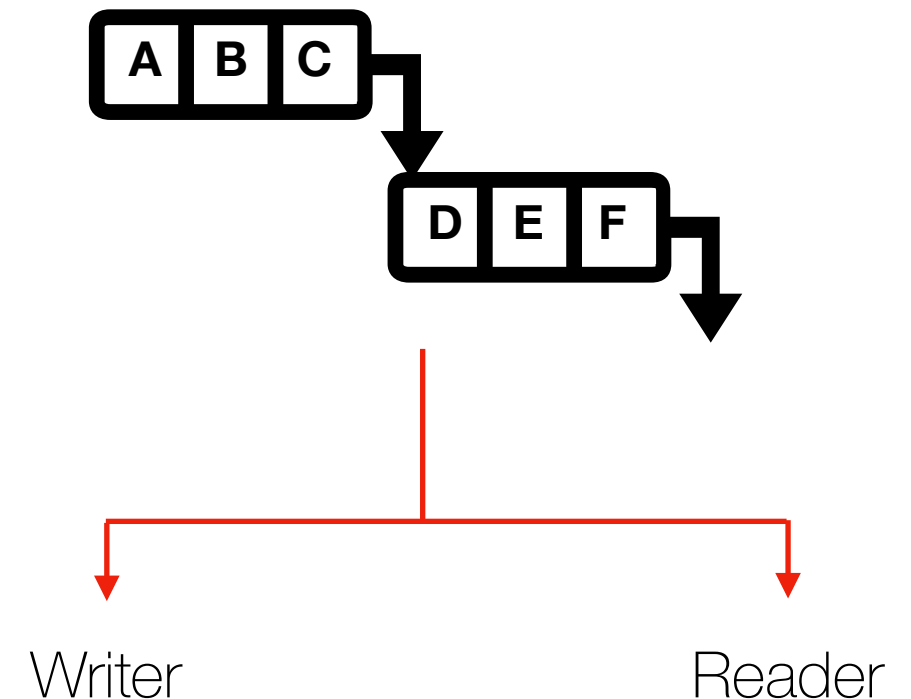
# Byte vs Character

Read/Write while there's something...

**binary**



**text**



# Byte vs Character

Read/Write while there's something...

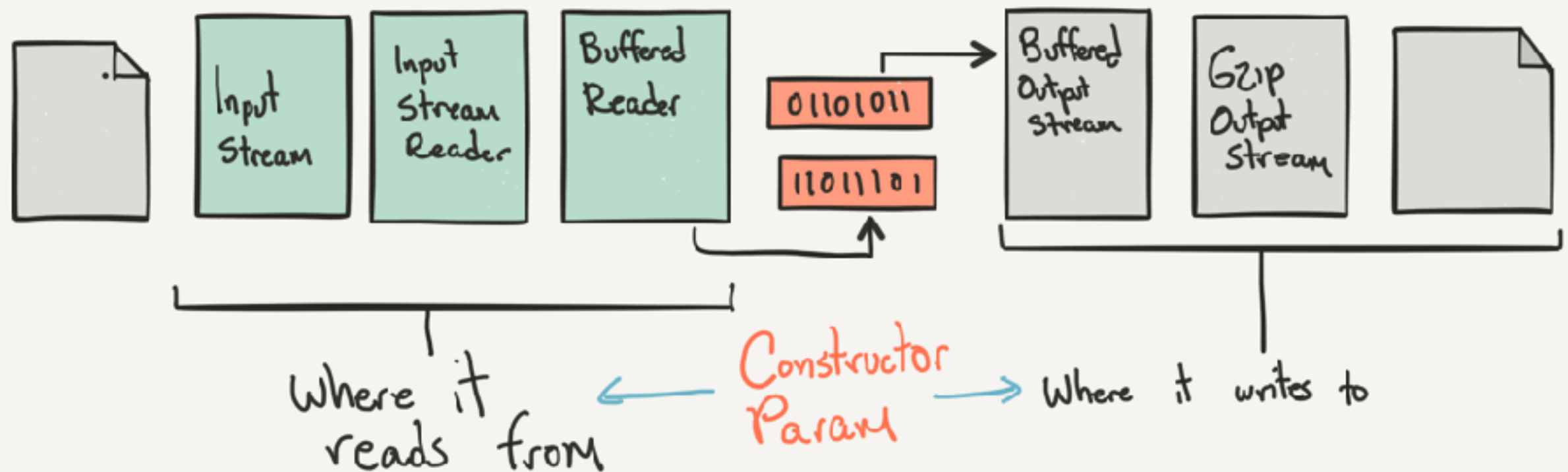
Byte Streams		Character streams	
<b>BufferedInputStream</b>	Buffered Input stream	<b>BufferedReader</b>	Buffered input character stream
<b>BufferedOutputStream</b>	Buffered output stream	<b>BufferedWriter</b>	Buffered output character stream
<b>ByteArrayInputStream</b>	Input Stream that reads from a byte array	<b>CharArrayReader</b>	Input stream that reads from a character array
<b>ByteArrayOutputStream</b>	Input Stream that writes to a byte Array	<b>CharArrayWriter</b>	Output stream that writes to a character array
<b>FileInputStream</b>	Input stream that reads from a file	<b>FileReader</b>	Input stream that reads from a file
<b>FileOutputStream</b>	Input stream that writes to a file	<b>FileWriter</b>	Input stream that writes to a file

# Common methods

## Unhandled exceptions

		Description
void	close()	closes the source
int	read()	reads next available, returns -1 if its not available
long	skip(long size)	skips bytes
void	close()	closes the stream
void	write(int b)	Writes

# Chaining Streams





# SimpleURLReader

Reading from URL

```
import java.net.*;
import java.io.*;

public class SimpleURLReader {
    public static void main(String[] args) throws Exception {

        URL address = new URL("https://www.uclaextension.edu/");
        InputStreamReader r = new
        InputStreamReader(address.openStream());
        char x[] = new char[100];
        while(r.read(x) > -1)
        {
            System.out.println(x);
        }
    }
}
```

# SimpleURLReader

Improved

```
import java.net.*;
import java.io.*;

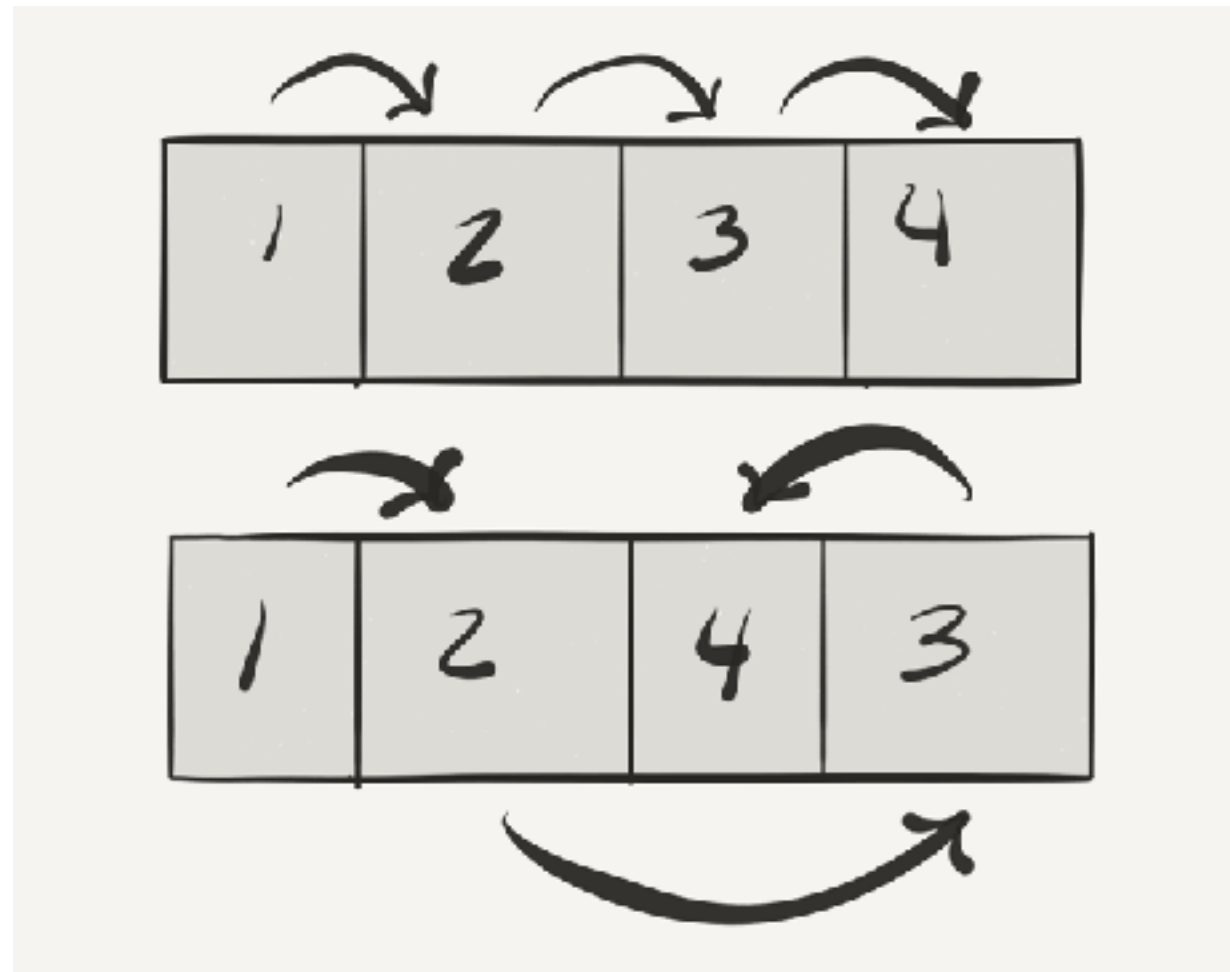
public class URLReader {
    public static void main(String[] args) throws Exception {

        URL addr = new URL("https://www.uclaextension.edu/");

        BufferedReader in = new BufferedReader(new
InputStreamReader(addr.openStream()));

        String inputLine;
        while ((inputLine = in.readLine()) != null)
            System.out.println(inputLine);
        in.close();
    }
}
```

# RandomAccess files



# Exercise

## Unhandled exceptions

- Download source from [uclaextension.edu](http://uclaextension.edu)
- Gzip compress the contents
- Save the file

# Exercise

## Unhandled exceptions

- Write a simple copy file command
- It receives 2 names as an argument (source & dest)
- Copy the file contents of file1 to file2