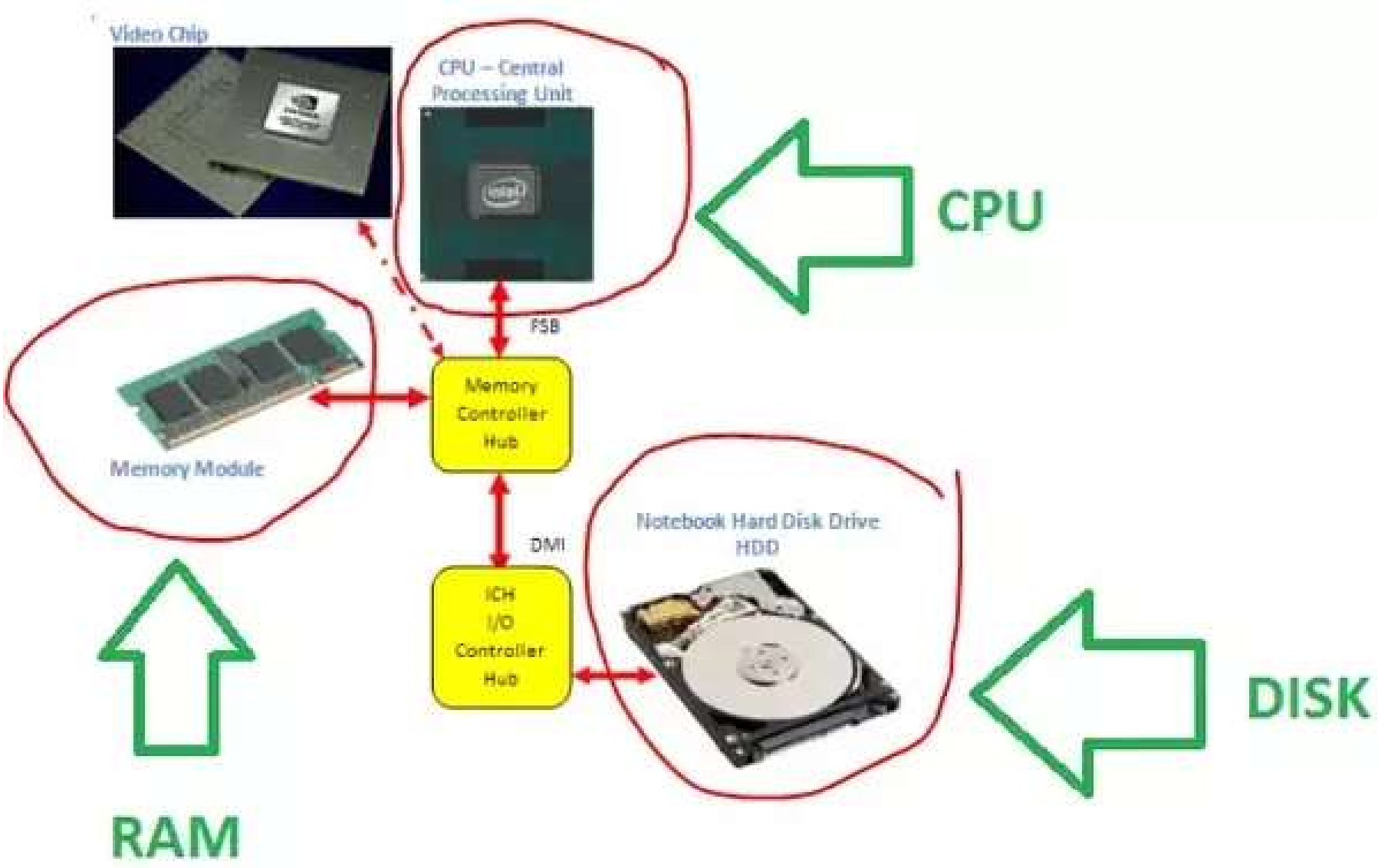
COMP 110/L Lecture 23

Mahdi Ebrahimi

Some slides adapted from Dr. Kyle Dewey

Outline

- Reading from files
- Writing to files


Video Chip
CPU – Central Processing Unit
CPU
FSB
Memory Controller Hub
Memory Module
DMI
ICH I/O Controller Hub
Notebook Hard Disk Drive HDD
DISK
RAM

Reading From Files

Motivation

Files act like very large inputs; basis for most things.

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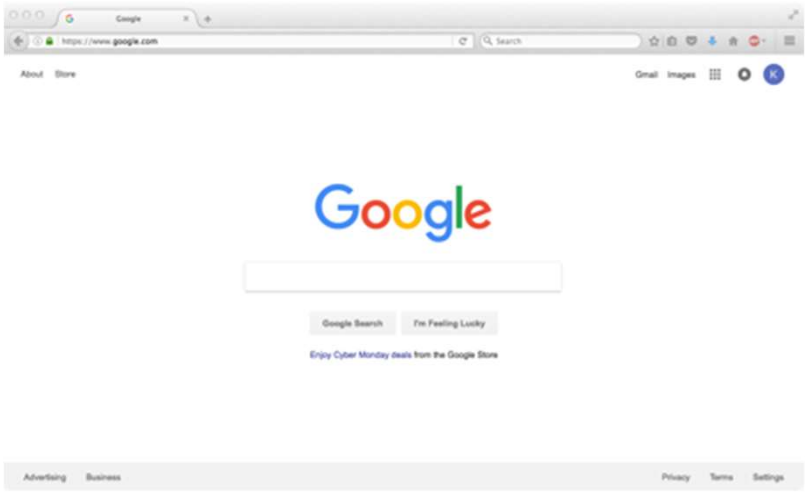

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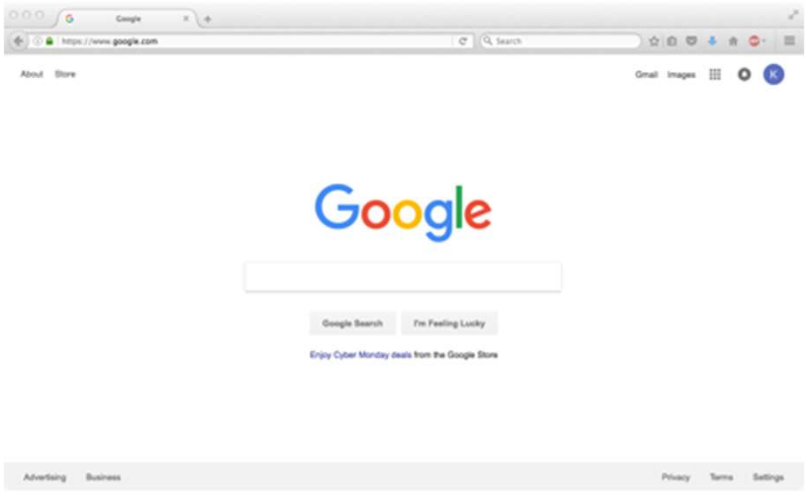



```
public class MyClass {
   ...
}
```

Reading from Files

Reading from Files

myFile.txt

myFile.txt

Contents

```
one
two
three
```

Reading from Files

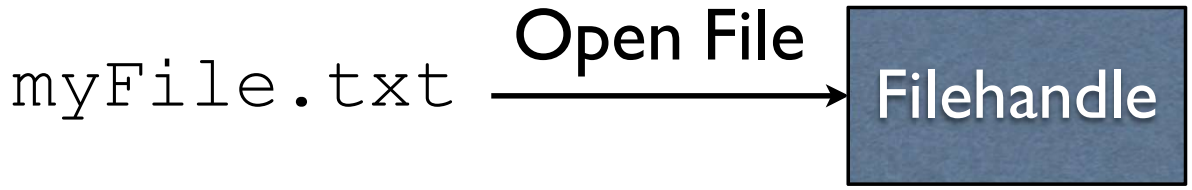
`myFile.txt` Open File 

`myFile.txt`

Contents

```
one
two
three
```

Reading from Files



myFile.txt

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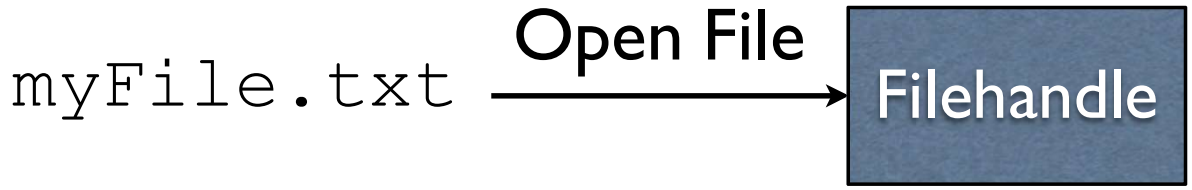
```

Reading from Files



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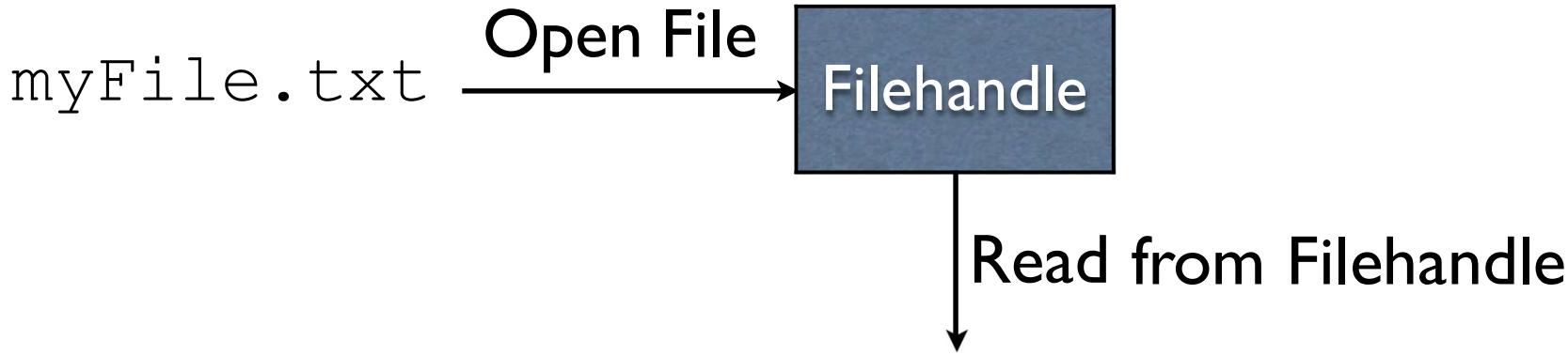

myFile.txt

Contents

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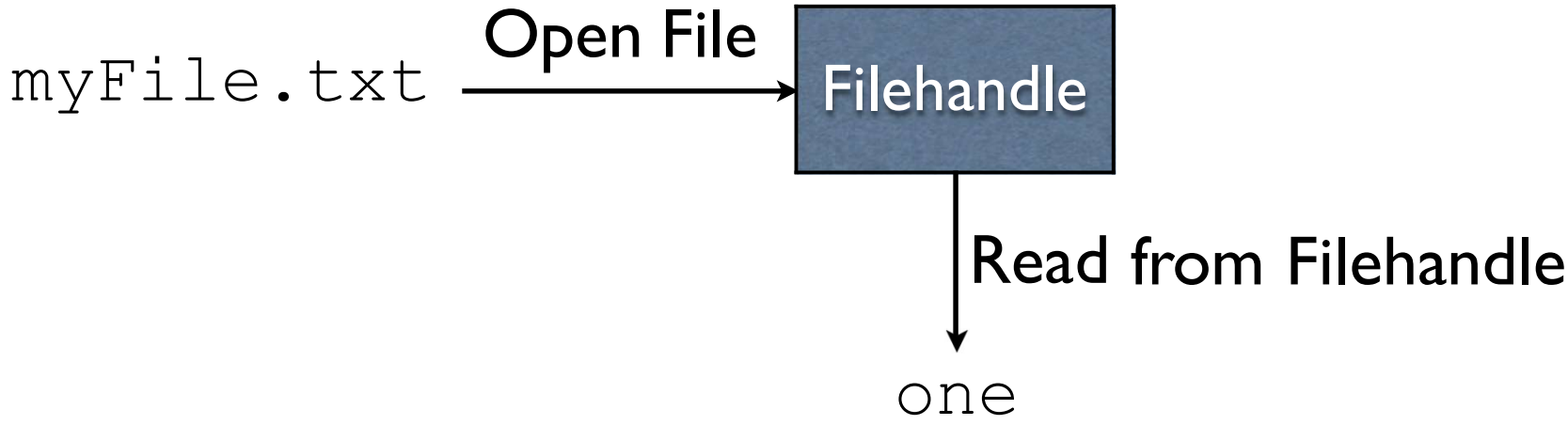
```

Reading from Files



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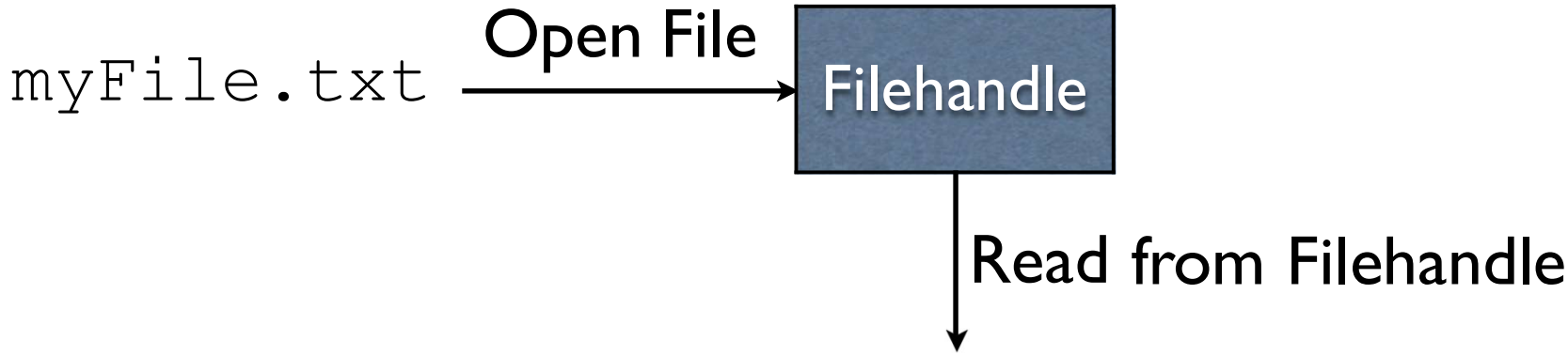

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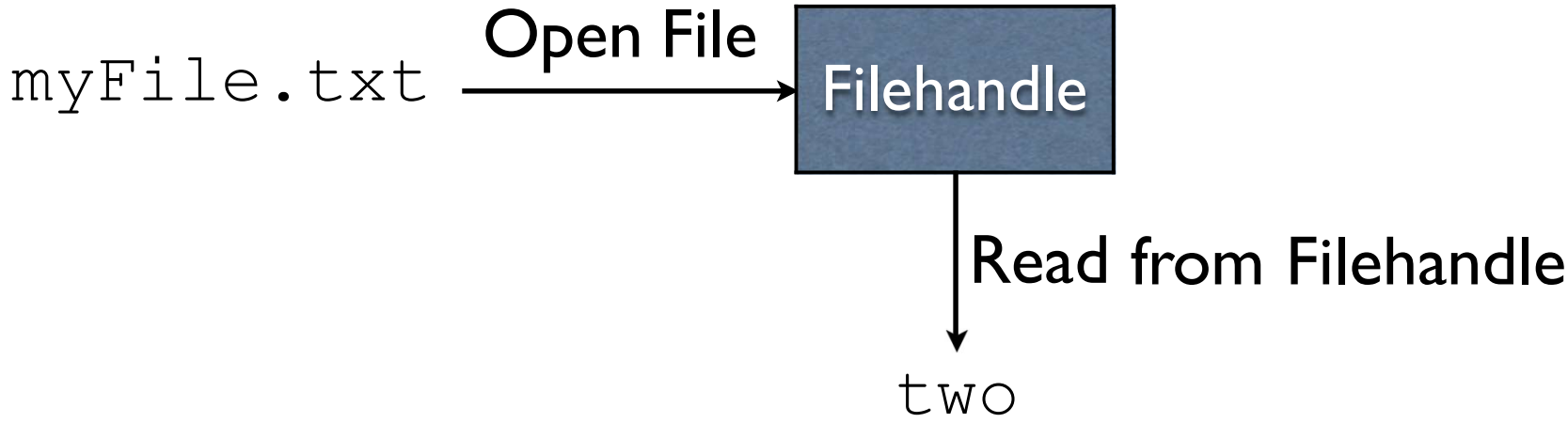
Reading from Files



myFile.txt

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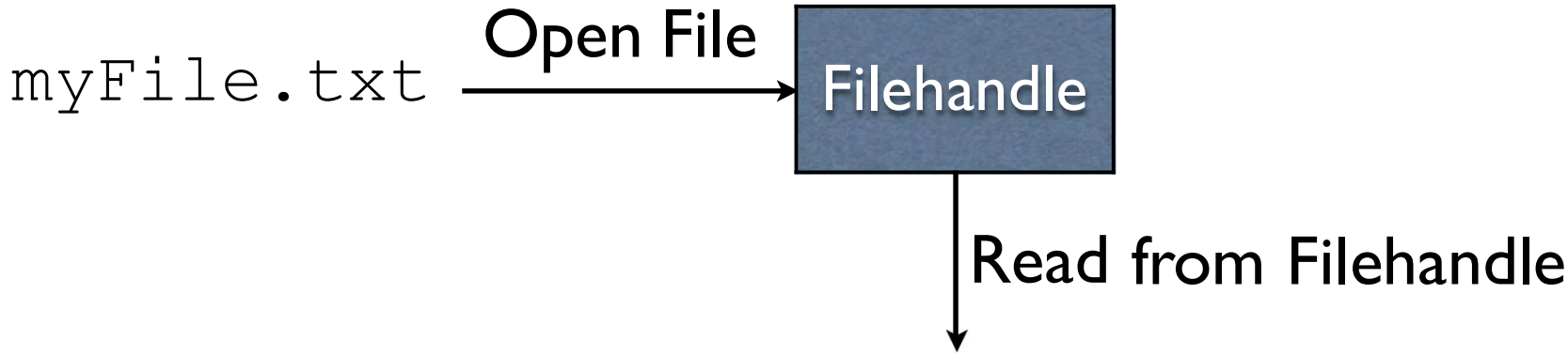
Reading from Files



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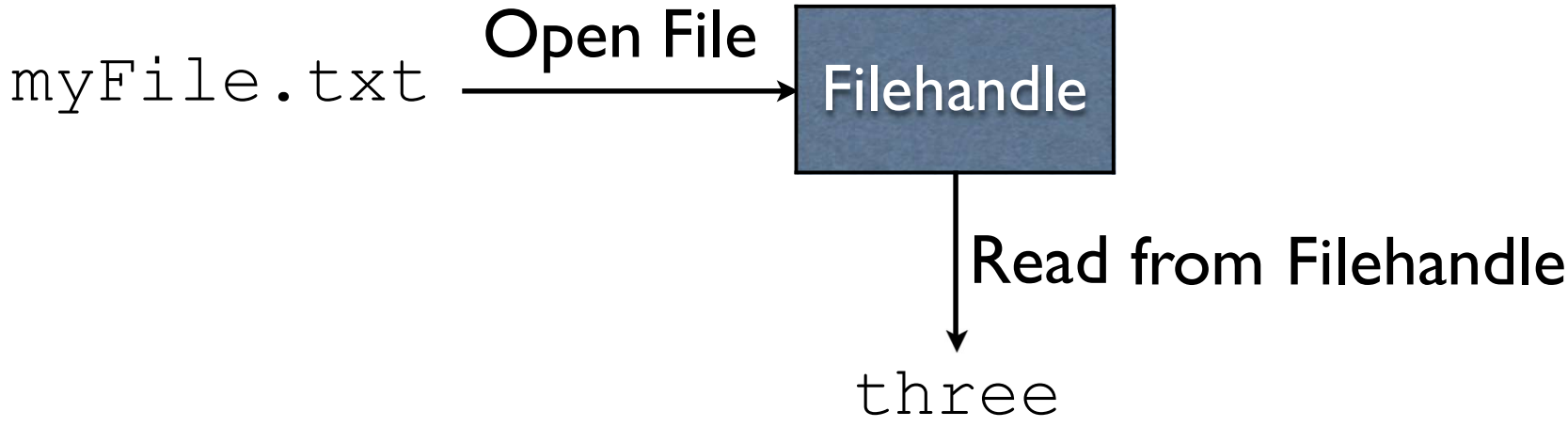
Reading from Files



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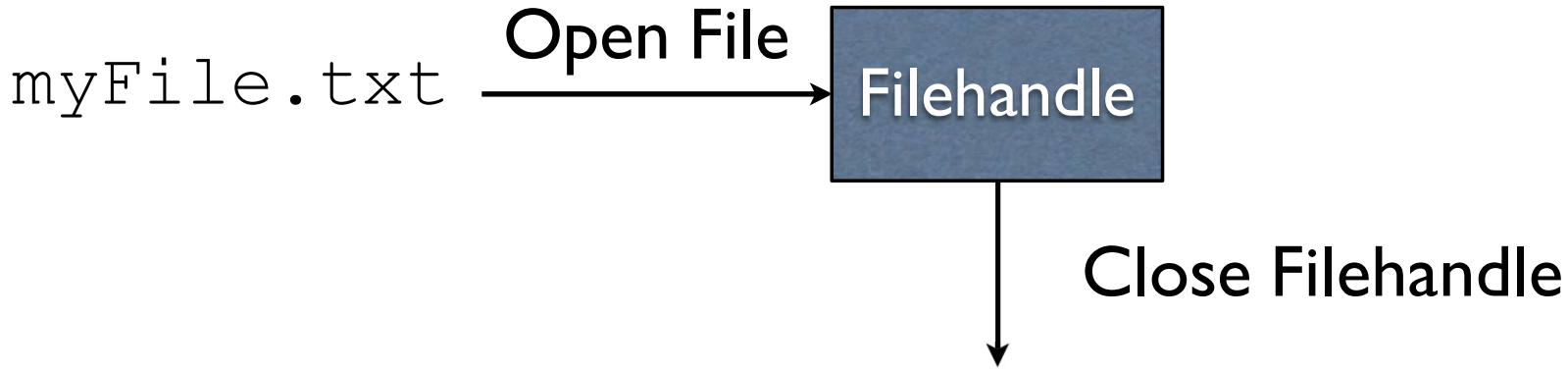
Reading from Files



myFile.txt

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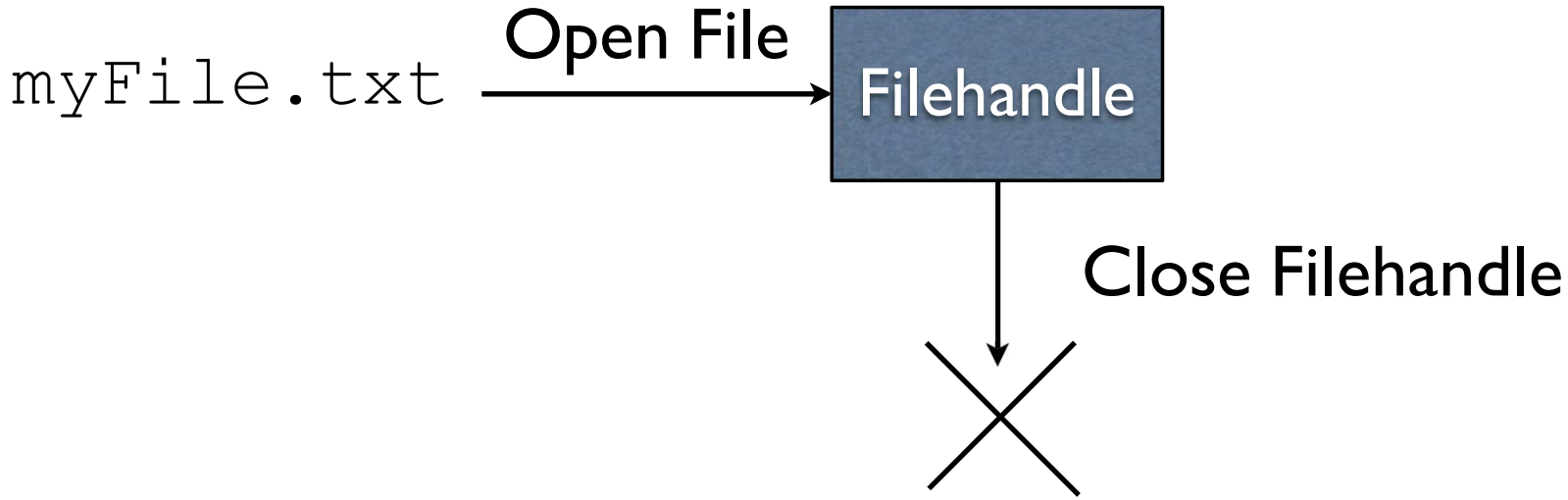

myFile.txt

Contents

```
one
two
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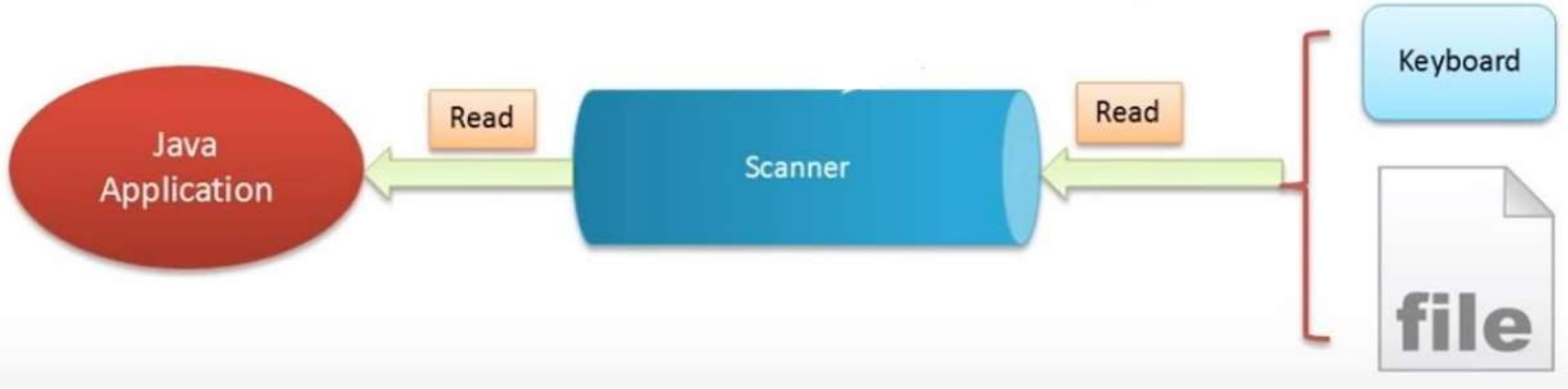
```

Reading from Files with `Scanner`

Reading from Files with `Scanner`



Reading from Files with `Scanner`

Step 1: Create `File`

Reading from Files with `Scanner`

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```
File myFile = new File("myFile.txt");
```

Reading from Files with `Scanner`

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```
File myFile = new File("myFile.txt");
```

Step 2: Create `Scanner` with the `File`

Reading from Files with `Scanner`

Step 1: Create `File`

```
File myFile = new File("myFile.txt");
```

Step 2: Create `Scanner` object with the `File`

```
Scanner input = new Scanner(myFile);
```

Reading from Files with `Scanner`

Step 1: Create `File`

```
File myFile = new File("myFile.txt");
```

Step 2: Create `Scanner` object with the `File`

```
Scanner input = new Scanner(myFile);
```

Step 3: Read from `Scanner`

Reading from Files with `Scanner`

Step 1: Create `File`

```
File myFile = new File("myFile.txt");
```

Step 2: Create `Scanner` object with the `File`

```
Scanner input = new Scanner(myFile);
```

Step 3: Read from `Scanner`

```
if (input.hasNextLine()) {
  String line = input.nextLine();
  ...
```

Reading from Files with `Scanner`

Step 4: Close `Scanner`

Reading from Files with `Scanner`

Step 4: Close `Scanner`

```
input.close();
```

Example:
`ReadFirstLine.java`

Example:
`ReadWholeFile.java`

`FileNotFoundException`

`Scanner` **will throw a**
`FileNotFoundException` **if the file does not exist.**

FileNotFoundException

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`FileNotFoundException` **if the file does not exist.**

Example:
`ReadWholeFileWithTry.java`

Writing to Files

Writing to Files

Writing to Files

Step 1: Create a `File`

```
File myFile = new File("myFile.txt");
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Writing to Files

Step 1: Create a `File`

```
File myFile = new File("myFile.txt");
```

Step 2: Create a `FileWriter`

```
FileWriter fw = new FileWriter(myFile);
```

Writing to Files

Step 1: Create a `File`

```
File myFile = new File("myFile.txt");
```

Step 2: Create a `FileWriter`

```
FileWriter fw = new FileWriter(myFile);
```

Step 3: Create a `BufferedWriter`

```
BufferedWriter bw =
  new BufferedWriter(fw);
```

Writing to Files

Step 4: Write to `BufferedWriter` as needed

```
bw.write("Hello");
bw.newLine();
bw.write("World");
bw.newLine();
```

Writing to Files

Step 4: Write to `BufferedWriter` as needed

```
bw.write("Hello");
bw.newLine();
bw.write("World");
bw.newLine();
```

Step 5: Close the `BufferedWriter`

```
bw.close();
```

Example:
`WriteStrings.java`

BufferedWriter

Observation: `PrintWriter` **seems to do everything** `BufferedWriter` **does, so why is** `BufferedWriter` **needed?**

`BufferedWriter`

Observation: `PrintWriter` seems to do everything `BufferedWriter` does, so why is `BufferedWriter` needed?

- Acts as a *buffer*
  - Layer between us saying `write` and the actual writing to the file
- Repeated short writes to files is **slow**
- Buffering idea: collect "writes" together in memory, then write to file all at once

finally

Motivation

Sometimes we want to perform an action, whether or not an exception is thrown.

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Sometimes we want to perform an action, whether or not an exception is thrown.

```
try {
  maybeThrowException();
  maybeDoThis();
} catch (SomeException e) {
  maybeDoThat();
} finally {
  alwaysDoThis();
}
maybeDoTheOtherThing();
```

Example:
`FinallyExample.java`

Common Use

- `finally` is often used to make sure a file was closed, even if an exception was thrown while manipulating the file
  - `WriteStrings.java` will **not** do this
  - See `WriteStringsFinally.java`