Exceptions, Files

An exception is an object that gets "thrown" to the operating system to indicate an error.

```
throw new FileNotFoundException();
```

This is how you might indicate to the OS that your program is crashing because an essential file did not exist.

Communicating errors

It's also how a method can tell its caller that it failed.

```
Scanner file = new Scanner(new File("foo.txt"));
```

If the file does not exist, a `FileNotFoundException` will be thrown by the Scanner's constructor.

If we don't do anything, the exception object will continue toward the OS.

Handling exceptions

If we want to stop the exception we can "catch" it.

```
try {
    Scanner file = new Scanner(new File("foo.txt"));
}
catch (FileNotFoundException e) {
    System.out.println("Error: foo.txt does not exist.");
}
```

The catch block only executes if the try block experiences a matching exception.

Programming example

Write a program that repeatedly prompts the user for a file name until the name of an existing file is given. Then the program should echo the given file to the screen.

Pseudocode (high level):

```
while no existing file selected
    prompt
while lines in file exist
    read line
    write line
```

More detail

```
fileFound = false
while not fileFound
    prompt
    fileFound = true
    try:
        open file
    catch FileNotFound:
        fileFound = false
while lines in file exist
    read line
    write line
```

```java
import java.util.Scanner;
import java.io.FileNotFoundException;
import java.io.File;

public class EchoFile {
    public static void main(String[] args) {
        Scanner in = new Scanner(System.in);
        Scanner file = null;
        while (file==null) {
            System.out.print("File to echo: ");
            String fileName = in.nextLine().trim();
            try {
                file = new Scanner(new File(fileName));
            }
            catch (FileNotFoundException e) {
                System.out.println(fileName + " does not exist.");
                file = null;
            }
        }
        while (file.hasNextLine()) {
            System.out.println(file.nextLine());
        }
    }
}
```