Output, Strings, Input

Simplest Java Program?

```
class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
```

Simplest Java Program?

```
class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
  }
}
```

class declares this code to be a software component for which bytecode should be generated by the compiler; `HelloWorld` is the name of the class; details later.

Simplest Java Program?

```
class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
```

public static void is required here when you want a class to include a "main" program that can be executed by the JVM (and it must be called `main`); details later.

Simplest Java Program?

```
class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
```

`String[] args` means that `main` expects the JVM to hand it an ***array*** of `String`s (called ***command-line arguments***) when it is executed; details later.

Simplest Java Program?

```
class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
```

`System.out` is an ***object*** you may use to give output to the user; `println` is a ***method*** of that object that you may ***call*** (***invoke***) to output something on its own line; details later.

Simplest Java Program?

```
class HelloWorld {
  public static void main(String[] args) {
    System.out.println("Hello World!");
  }
}
```

"Hello World!" is a character string to be output to the user; details later.

Another Version (sans Comments)

```
import components.simplewriter.SimpleWriter;
import components.simplewriter.SimpleWriter1L;
public final class HelloWorld {
  private HelloWorld() {
  }
  public static void main(String[] args) {
    SimpleWriter out = new SimpleWriter1L();
    out.println("Hello World!");
    out.close();
  }
}
```

Another Version (sans Comments)

```
import components.simplewriter.SimpleWriter;
import components.simplewriter.SimpleWriter1L;
public final class HelloWorld {
  pri te
  }
  public                                    s) {
    Simpl                                   r1L();
    out.p
    out.c
  }
}
```

`import` indicates you want to use a component in your code; `components` is a ***package*** containing OSU CSE components; its `simplewriter` package offers a few advantages over using built-in `System.out`; details later.

Another Version (sans Comments)

```
import components.simplewriter.SimpleWriter;
import components.simplewriter.SimpleWriter1L;
public final class HelloWorld {
  private HelloWorld() {
  }
  public s                                    args) {
    SimpleW                                   iter1L();
    out.pri
    out.clo
  }
}
```

public means anyone can use this class;
final means no one can incrementally change this class by using ***inheritance***; details later.

Another Version (sans Comments)

```
import components.simplewriter.SimpleWriter;
import components.simplewriter.SimpleWriter1L;
public final class HelloWorld {
  private HelloWorld() {
  }
  public s                                    rgs) {
    Simple                                    ter1L();
    out.pr
    out.c
  }
}
```

`private HelloWorld()` means the `HelloWorld` class does not define a ***type***, i.e., no one can create an object from the class `HelloWorld` because it is a ***utility class***; details later.

Another Version (sans Comments)

```
import comp                                              leWriter;
import comp                                              leWriter1L;
public fina
  private H
  }
  public stati  oid main(String[] args) {
    SimpleWriter out = new SimpleWriter1L();
    out.println("Hello World!");
    out.close();
  }
}
```

`SimpleWriter` is the type of a newly declared ***variable***; `out` is the name of that variable; details later.

Another Version (sans Comments)

```
import c                                    Writer;
import c                                    Writer1L;
public f
  privat
  }
  public static void main(St      [] args) {
    SimpleWriter out = new SimpleWriter1L();
    out.println("Hello World!");
    out.close();
  }
}
```

new creates a new object to which the variable `out` is a ***reference***; `SimpleWriter1L` is the class whose code should be used when any method of `out` is called; details later.

Another Version (sans Comments)

```
import components.simplewriter.SimpleWriter;
import comp                                  pleWriter1L;
public fina
  private
  }
  public st                                  ( [] args) {
    SimpleW iter out = new SimpleWriter1L();
    out.println("Hello World!");
    out.close();
  }
}
```

`out` has a `println` method, too, nearly identical to that of `System.out`; details later.

Another Version (sans Comments)

```
import components.simplewriter.SimpleWriter;
import comp                                  pleWriter1L;
public fina
  private
  }
  public st                                        args) {
    SimpleWr                                    riter1L();
    out.pri                                  ("Hello World!");
    out.close();
  }
}
```

out has a close method as well, and you need to call it when you are done using out; details later.

Output: `SimpleWriter`

- The OSU CSE components provide a simple way to provide output to a user via the ***console*** or a ***file***

```
SimpleWriter consoleOut =
  new SimpleWriter1L();
SimpleWriter fileOut =
  new SimpleWriter1L("foo.txt");
```

Output Examples

```
consoleOut.print("Prompt: ");
consoleOut.println();
fileOut.println("A line.");
```

Closing Output

- When you are done ***writing*** output to a `SimpleWriter` ***stream***, you must ***close*** the stream:

```
consoleOut.close();
fileOut.close();
```

Character Strings

- Java has special features to deal with character strings
- Examples

```
SimpleWriter fileOut =
  new SimpleWriter1L("foo.txt");
fileOut.print("Hi, Mr. Foo.");
```

- This intro is just the tip of the iceberg!

Character Strings

- Java has special features to deal with character strings
- Examples

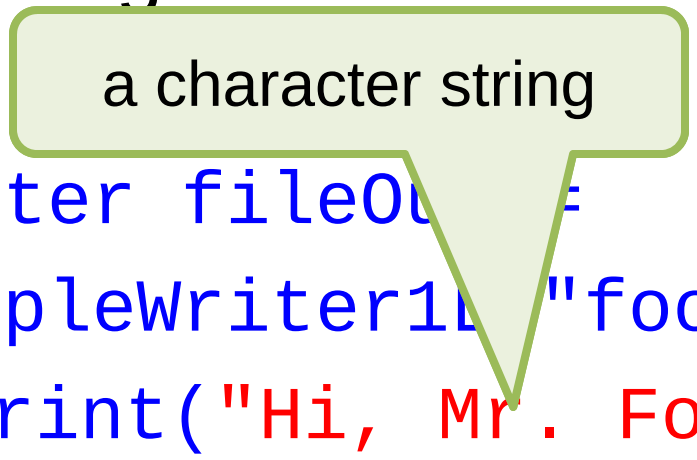
a character string

```
SimpleWriter fileOut
  new SimpleWriter1L("foo.txt");
fileOut.print("Hi, Mr. Foo.");
```

- This intro is just the tip of the iceberg!

Character Strings

- Java has special features to deal with character strings
- Examples




```
SimpleWriter fileOut =
  new SimpleWriter1L("foo.txt");
fileOut.print("Hi, Mr. Foo.");
```

- This intro is just the tip of the iceberg!

Character-String Literals

- Character-string constants, also called ***`String literals`***, are enclosed in double-quotes, e.g.:

```
"Hello World!"
```

- Character strings can be ***concatenated*** (joined together to create new character strings) using the **+** operator, e.g.:

```
"Hello " + "World!"
```

String Variables

- You may ***declare*** a ***`String` variable***, and ***assign*** an initial character-string ***value*** to it, as follows:

```
String cheer = "Go";
```

String Variables

- You may assign any other character-string value to the same variable later, e.g.:

```
cheer = cheer + " Bucks!";
```

- Before assignment above:

String Variables

- You may assign any other character-string value to the same variable later, e.g.:

```
cheer = cheer + " Bucks!";
```

- After assignment above:

Input: `SimpleReader`

- The OSU CSE components provide a simple way to get input from a user via the ***keyboard*** or a ***file***

```
SimpleReader keyboardIn =
  new SimpleReader1L();
SimpleReader fileIn =
  new SimpleReader1L("foo.txt");
```

Input Examples

```
String line = keyboardIn.nextLine();
line = fileIn.nextLine();
```

Input Examples

```
String line = keyboardIn.nextLine();
line = fileIn.nextLine();
```

This method, which reads up through and including the next ***line separator***, and returns everything it reads *except* that next line separator, is really the only method you need to read input from the keyboard and text files.

Closing Input

- When you are done ***reading*** input from a `SimpleReader` ***stream***, you must ***close*** the stream:

```
keyboardIn.close();
fileIn.close();
```

Resources

- Java Tutorials ("Hello World" program)
  - http://docs.oracle.com/javase/tutorial/getStarted/application/index.html
- OSU CSE components API (`SimpleWriter`, `SimpleReader`)
  - http://cse.osu.edu/software/common/doc/