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Java Programming Language SE – 6

Module 11: Console I/O and File I/O

Certified Professional

Java SE 6 Programmer

Objectives

- Read data from the console
- Write data to the console
- Describe files and file I/O

Console I/O

- The variable System.out enables you to write to standard output. System.out is an object of type PrintStream.
- The variable System.in enables you to read from standard input. System.in is an object of type InputStream.
- The variable System.err enables you to write to standard error. System.err is an object of type PrintStream.

Writing to Standard Output

- The println methods print the argument and a newline character (\n).
- The print methods print the argument without a newline character.
- The print and println methods are overloaded for most primitive types (boolean, char, int, long, float, and double) and for char[], Object, and String.
- The print(Object) and println(Object) methods call the toString method on the argument.

Reading From Standard Input

```
public class KeyboardInput {
public static void main (String args[]) {
String s;
// Create a buffered reader to read
// each line from the keyboard.
InputStreamReader ir
= new InputStreamReader(System.in);
BufferedReader in = new BufferedReader(ir);
System.out.println("Unix: Type ctrl-d to exit." +
"\nWindows: Type ctrl-z to exit");
```

Reading From Standard Input

```
try {
// Read each input line and echo it to the screen.
s = in.readLine();
while ( s != null ) {
System.out.println("Read: " + s);
s = in.readLine();
}
// Close the buffered reader.
in.close();
} catch (IOException e) { // Catch any IO exceptions.
e.printStackTrace();
}}}
```

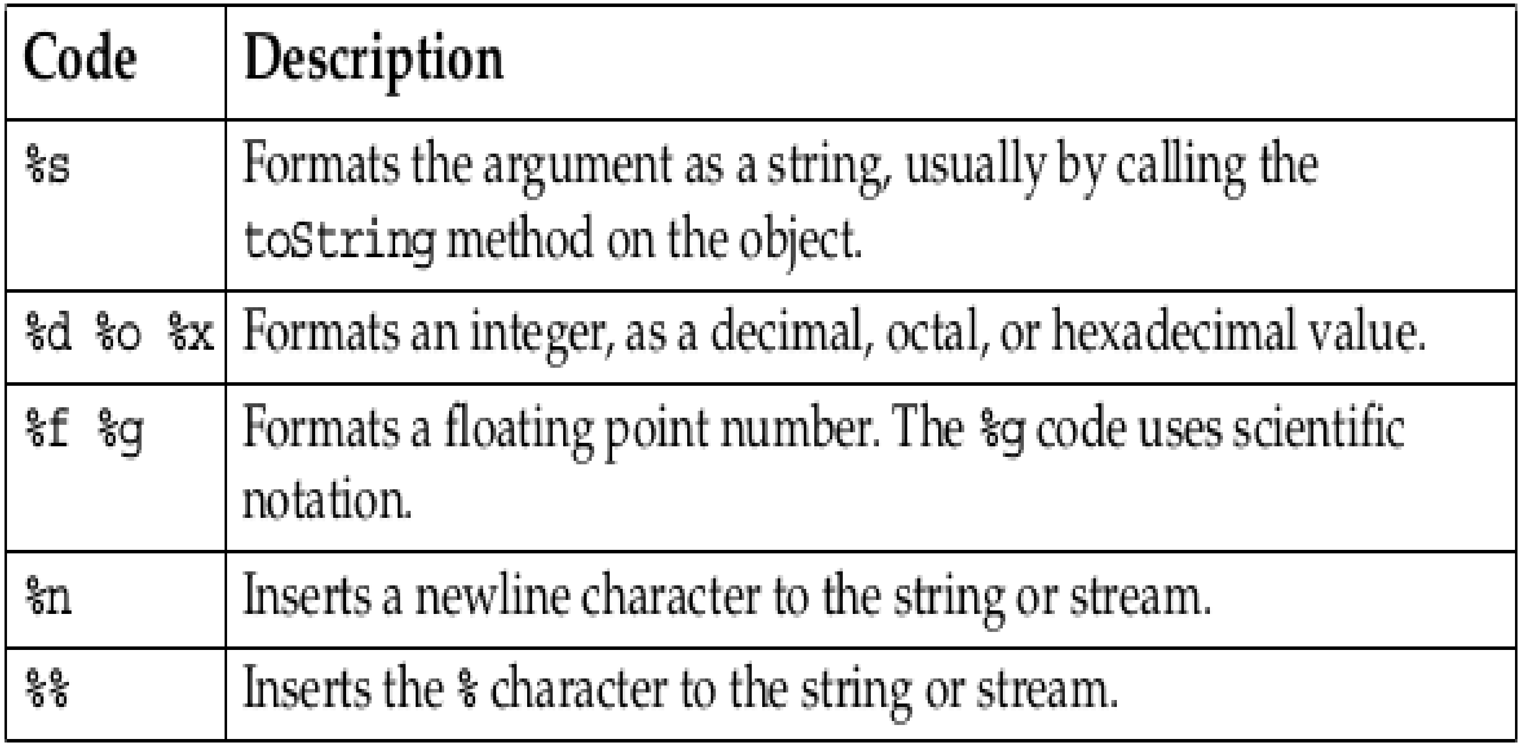
Simple Formatted Output

- You can use the formatting functionality as follows:

  out.printf(“name count\n”);

  String s = String.format(“%s %5d%n”, user, total);
- Common formatting codes are listed in this table.

Simple Formatted Output



Code	Description
%s	Formats the argument as a string, usually by calling the `toString` method on the object.
%d %o %x	Formats an integer, as a decimal, octal, or hexadecimal value.
%f %g	Formats a floating point number. The %g code uses scientific notation.
%n	Inserts a newline character to the string or stream.
%%	Inserts the % character to the string or stream.

Simple Formatted Input

The Scanner class provides a formatted input function.

A Scanner class can be used with console input streams as well as file or network streams.

Simple Formatted Input

You can read console input as follows:

```
import java.io.*;
import java.util.Scanner;
public class ScanTest {
public static void main(String [] args) {
Scanner s = new Scanner(System.in);
String param = s.next();
System.out.println("the param 1" + param);
int value = s.nextInt();
System.out.println("second param" + value);
s.close();
}}
```

Files and File I/O

The java.io package enables you to do the following:

- Create File objects
- Manipulate File objects
- Read and write to file streams

Creating a New File Object

The File class provides several utilities:

- File myFile;
- myFile = new File("myfile.txt");
- myFile = new File("MyDocs", "myfile.txt");

Creating a New File Object

- Directories are treated like files in the Java programming language. You can create a File object that represents a directory and then use it to identify other files, for example:

```
File myDir = new File("MyDocs");
myFile = new File(myDir, "myfile.txt");
```

The File Tests and Utilities

- File information:
  - String getName()
  - String getPath()
  - String getAbsolutePath()
  - String getParent()
  - long lastModified()
  - long length()

The File Tests and Utilities

- File modification:
  - boolean renameTo(File newName)
  - boolean delete()
- Directory utilities:
  - boolean mkdir()
  - String[] list()

The File Tests and Utilities

- File tests:
  - Boolean exists()
  - Boolean cabRead()
  - Boolean canRead()
  - Boolean isFile()
  - Boolean isDirectory()
  - Boolean isAbsolute();
  - Boolean is Hidden();

File Stream I/O

- For file input:
  - Use the FileReader class to read characters.
  - Use the BufferedReader class to use the readLine method.
- For file output:
  - Use the FileWriter class to write characters.
  - Use the PrintWriter class to use the print and println methods.

File Input Example

```
public class ReadFile {
public static void main (String[] args) {
// Create file
File file = new File(args[0]);
try {
// Create a buffered reader
// to read each line from a file.
BufferedReader in
= new BufferedReader(new FileReader(file));
String s;
```

Printing a File

```
s = in.readLine();
while ( s != null ) {
System.out.println("Read: " + s);
s = in.readLine();
}
// Close the buffered reader
in.close();
} catch (FileNotFoundException e1) {
// If this file does not exist
System.err.println("File not found: " + file);
} catch (IOException e2) {
// Catch any other IO exceptions.
e2.printStackTrace();
}}}
```

File Output Example

```
public class WriteFile {
public static void main (String[] args) {
// Create file
File file = new File(args[0]);
try {
// Create a buffered reader to read each line from standard in.
InputStreamReader isr
= new InputStreamReader(System.in);
BufferedReader in
= new BufferedReader(isr);
// Create a print writer on this file.
PrintWriter out
= new PrintWriter(new FileWriter(file));
String s;
```

File Output Example

```
System.out.print("Enter file text. ");
System.out.println("[Type ctrl-d to stop.]");
// Read each input line and echo it to the screen.
while ((s = in.readLine()) != null) {
out.println(s);
}
// Close the buffered reader and the file print writer.
in.close();
out.close();
} catch (IOException e) {
// Catch any IO exceptions.
e.printStackTrace();
}}}
```

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Thank you

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