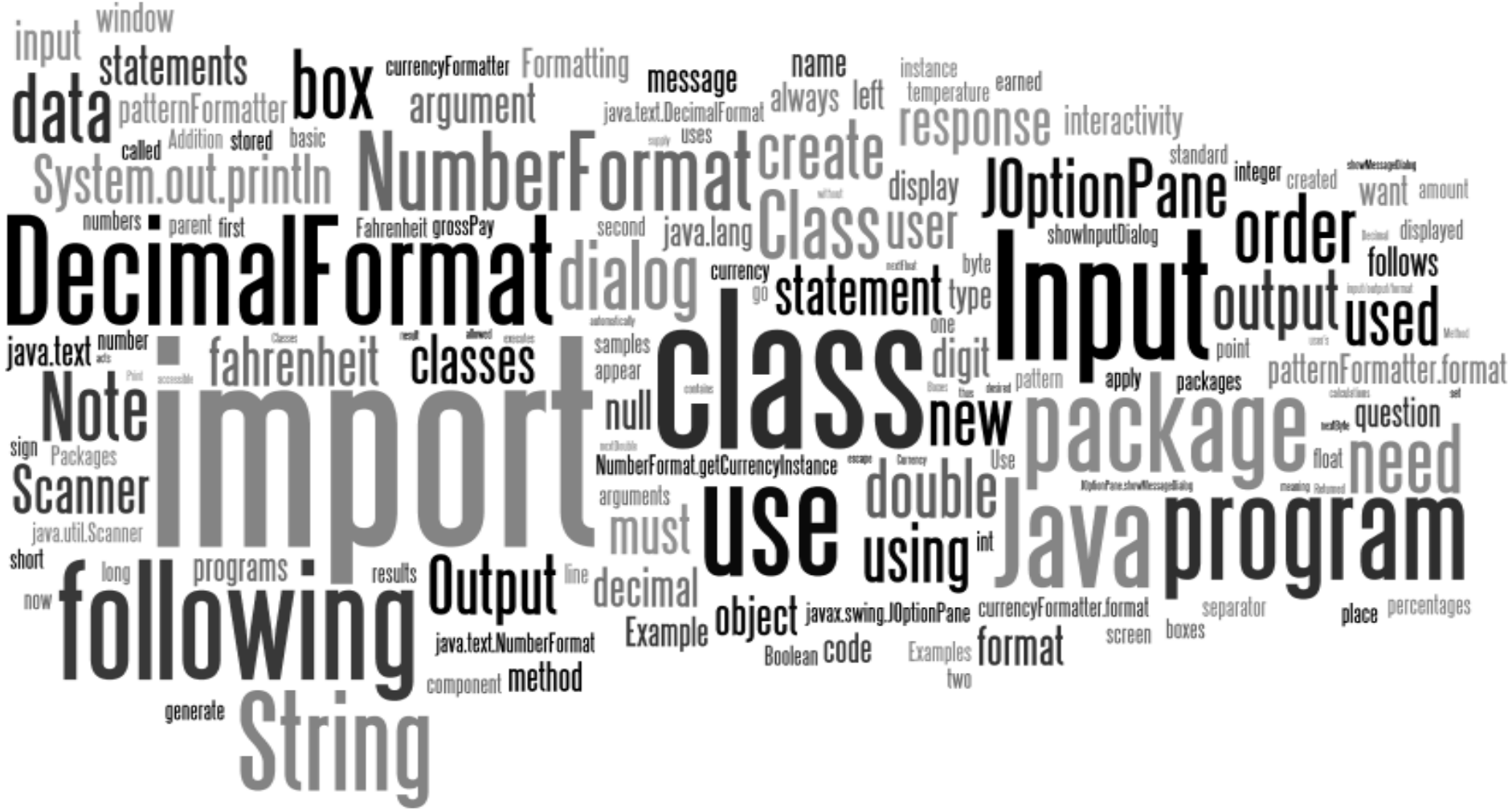
Chapter 3



Input/Output

Objectives

- Apply formats (currency and percentages) to output.
- Use keyboard input in Java program to create interactivity.
- Use dialog box input/output in Java program to create interactivity.
- Associate import statements with corresponding input/output/format classes/packages.

Scanner Class

Input data from the Java console:

Value Returned	Method	Returns…
byte	nextByte()	Input as a byte.
short	nextShort()	Input as a short.
int	nextInt()	Input as an integer.
long	nextLong()	Input as a long.
float	nextFloat()	Input as a float.
double	nextDouble()	Input as a double.
boolean	nextBoolean()	Input as a boolean.
String	next()	Next word as a String.
String	nextLine()	Input line as a String.

Note: In order to use this class, you must use the following import statement:
import java.util.Scanner;

Scanner Age Example:

```
/*  This program will prompt the user for their age and then display their age
    Written by your name
    Date
    JDK Version  */

import java.util.Scanner;  //import needed for using the Scanner class

public class Age
{
    public static void main(String[] args)
    {
        Scanner keyboard = new Scanner (System.in); //declaring Scanner object
        System.out.print("Enter your age: ");
        int age = keyboard.nextInt(); //take in their age & save in age variable
        System.out.println("You are " + age + " years old."); //output
    }
}
```

```
Output - Age (run)
run:
Enter your age: 21
You are 21 years old.
BUILD SUCCESSFUL (total time: 5 seconds)
```

Scanner Addition Example:

```
/* This program will prompt the user for 2 numbers, add those 2 numbers
   together, and display the output.
   Written by your name
   Date
   JDK Version  */

import java.util.Scanner;  //import needed for using the Scanner class

public class Adding
{
    public static void main(String[] args)
    {
        Scanner keyboard = new Scanner (System.in); //declaring Scanner object
        System.out.print("Enter a number > ");
        //take in the first number from user & save in number1 variable
        int number1 = keyboard.nextInt();
        System.out.print("Enter another number > ");
        //take in the second number from user & save in number2 variable
        int number2 = keyboard.nextInt();
        int answer = number1 + number2;
        System.out.println(number1 + "+" + number2 + "=" + answer); //output
    }
}
```

```
Output - Adding (run)
run:
Enter a number > 3
Enter another number > 4
3+4=7
BUILD SUCCESSFUL (total time: 5 seconds)
```

Input Dialog Boxes

An input dialog box asks a question and uses a box for entering a response.

String response = JOptionPane.showInputDialog(null, "Enter Fahrenheit");

If this data is to be used in a calculation, it will need to be converted from String data to double data or integer data with one of the following statements:

double fahrenheit = Double.parseDouble(response);

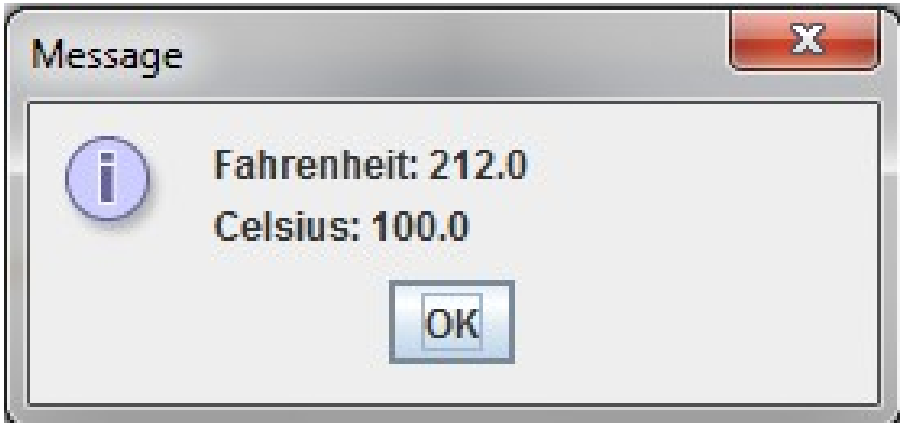
Note: In order to use this class, you must use the following import statement:

import javax.swing.JOptionPane;

Message Dialog Boxes

Uses a simple window to display (output) information.

```
JOptionPane.showMessageDialog(null,  "Fahrenheit: " + fahrenheit  +
    "\nCelsius: " + celsius);
```



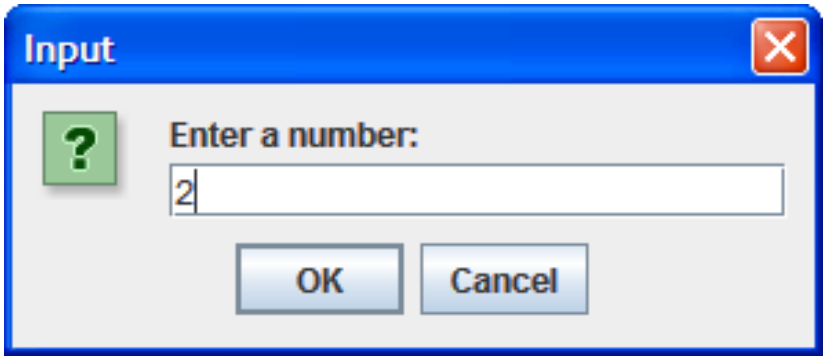
Note: In order to use this class, you must use the following import statement:

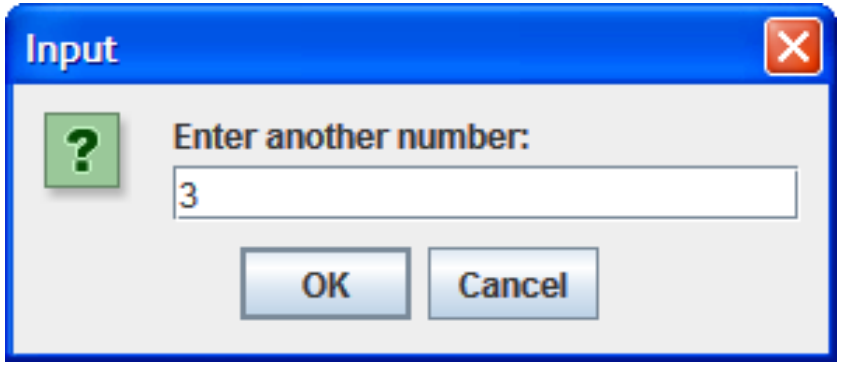
import javax.swing.JOptionPane;

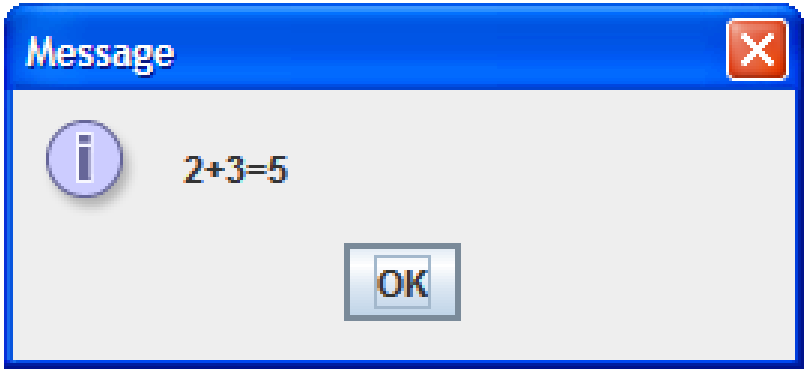
JOptionPane Addition Example

```
/*  This program will prompt the user for 2 numbers, add those 2 numbers
    together, and display the output.
    Written by your name
    Date
    JDK Version  */

import javax.swing.JOptionPane;  //import needed for using JOptionPane Boxes

public class Adding2
{
    public static void main(String[] args)
    {
        String response;
        response = JOptionPane.showInputDialog(null, "Enter a number:");
        double number1 = Double.parseDouble(response);
        response = JOptionPane.showInputDialog(null, "Enter another number:");
        double number2 = Double.parseDouble(response);
        double answer = number1 + number2;
        JOptionPane.showMessageDialog(null, number1 + "+" + number2 + "=" + answer);
    }
}
```

JOptionPane Addition Output







NumberFormat Class

- Used to format output as currency.
- Currency Example:

```
NumberFormat currencyFormatter =
NumberFormat.getCurrencyInstance( );
System.out.println(currencyFormatter.format(20.5) );
Output:  $20.50
```

Note: In order to use this NumberFormat class, you must use the import statement:
import java.text.NumberFormat;

DecimalFormat Class

Used to format output with a specific number of digits before and after the decimal point.

Character	Meaning
0	Required digit. Print 0 if there isn't a digit in this place.
#	Optional digit. Leave blank if there isn't a digit in this place.
.	Decimal point separator.
,	Comma separator.
%	Multiplies the result by 100 and displays a percent sign.

```
double fahrenheit = 212.5;
DecimalFormat patternFormatter = new DecimalFormat ("#,###.00");
System.out.println("The temperature is " + patternFormatter.format(fahrenheit));
```

Output: The temperature is 212.50

Note: In order to use this NumberFormat class, you must use the following import statement:
import java.text.DecimalFormat;