Java derives much of its power from the many classes already defined in the Java API. But how are we ever to learn and use these classes if we don’t know about them? Any text on Java can only begin to cover these classes and the methods defined in them. For a complete listing of these classes and methods you will need to visit Java 2 Platform Standard Edition 6.0 API Specification.

Although the information covered in the textbook is sufficient to complete all of the programming and lab assignments for this course, you may find yourself wishing for a “better” class or method, or just more information on a known class or method. The Java™ Platform, Standard Edition, v 6.0 API Specification website is the place to find that information!

All class definitions are found in the Java API Specifications. API stands for application programming interfaces and is more simply a set of existing “building blocks” for programmers to use to develop programs. The API is divided into packages. Packages contain classes. Classes contain methods. Methods contain Java code. We use methods in our Java programs.

1. Access Sun Microsystems’s Java web site, using the link above or navigate to it from java.sun.com

The API Specifications page is divided into 3 sections. The upper left-hand section is used to navigate to different packages (collections of classes). Below this section is a listing of all Java classes in alphabetical order. The largest section of the page displays details about a selected package or class. At present (before selecting a class or package), all Java packages are listed.

Scroll down the main display section of the page until you find the java.lang package. What does it provide?

_________________________________________________________________________

_______________________________________________________________________

The java.lang package is automatically provided/imported for all Java programs. Find the java.util package. Can you find a class provided by java.util that we learned about in Chapter 3?

_______________________________________________________________________

Clicking on any package will get a detailed description of the package. Click on java.util. This detailed description provides 5 summaries of items contained in this package. List the five summaries which are written in the blue background:

_______________________________________________________________________

_______________________________________________________________________

_______________________________________________________________________

________________________________________________________

For now, we are interested in the Class Summary. This summary lists the classes that are contained in the package. The left column contains the name of the class. Notice that all class names start with a
capital letter. The right column contains the description of the class. Scroll down until you find the Scanner class. What does it contain?

Click on the Scanner class. You will get a detailed description of what is contained in the Scanner class. Notice that the package name - java.util - appears (in small print) above the class name. Scroll down a few pages to see the two summaries available for the Scanner class. What are they?

Scroll down to the Method Summary. The left column indicates the type of information the method will return. The right column contains the method name (underlined), the parameters (in parentheses) and a brief description of the method.

Examine the first method listed for the Scanner class. It is the close() method. The left column contains void, indicating that this particular method does not return anything. All methods have a return type, even if the return type is simply void. The right column tells us the name of the method is close and the empty () indicates that this method does not require any parameters to be used. The name of the method is located immediately before the open parenthesis. All methods require parentheses.

Based on this information, you could invoke this method using the programming statement scan.close(); where scan is an already declared and initialized Scanner object.

Let's look at another Scanner method. Locate the method findInLine(String pattern). This method's return type is a String. It requires 1 parameter in order to invoke this method. The parameter is of type String and is some kind of pattern. Note that there is also another version of this method that accepts a parameter of type Pattern (another class). We will focus on the version that has a String parameter. The definition tells us that this method “attempts to find the next occurrence of a pattern constructed from the specified string, ignoring delimiters.”

Based on this information, you could invoke this method using the programming statement String result = scan.findInLine(“xx”); where scan is an already declared and initialized Scanner object. The variable result will then reference the String produced/returned by the method.

Click on the name of the Scanner method findInLine(String pattern). This will provide you additional information about the method. Notice the line at the top of the page:

public String findInLine(String pattern)

This line is known as the method header. This is what we see in two columns on the previous page with the added word public. The word public indicates that this method is “publically assessible” so that we can use it. The return type follows and is a String. A method only ever returns one type. The word located immediately before the parentheses is the name of the method. Everything listed inside of the parentheses are the parameter specifications.

Choose your browser's back button to return to the Scanner class’s Method Summary. Let's look at one more method of the Scanner class. To date, we have used the nextInt() method to capture integer input
from the user. Locate the `nextInt()` method. This method is also listed twice. The first appearance of this method does not specify a parameter and the second appearance of the method does. Note that both `nextInt()` methods return an integer. If you have a Scanner object declared and initialized called `scan` and an integer declared and initialized call `num`, the `nextInt()` method could be invoked one of two ways:

```java
int inputA = scan.nextInt();
int inputB = scan.nextInt(num);
```

(It might take some detective work to figure out exactly what the `num` parameter could possibly be indicating here. If you have time, write a little program to investigate this question. Otherwise, you can move on and it will not be a great loss—except to your curiosity!)

Ok, now let’s look at another class – the String class. To locate the String class, use the left hand alphabetically listing of classes. What package is the String class part of?

_________________________________________________________________________

Under the String class Method Summary, locate the String method `trim()`. For this method, provide the following:

Method return type: __________________________________________________________
Required parameters for the method: _____________________________________________
Purpose of the method: _______________________________________________________

What would be displayed as a result of executing the following programming statements?

```java
String fname = "Ben", lname = "Franklin";
System.out.println( fname + lname);
System.out.println( fname.trim() + lname);
```

_________________________________________________________________________

There are so many great methods to be used from the String class that you will surely return to this class’s API many times! But before you review more or the String methods, let’s take a look a look at a special type of class.

The `Math` class is a class that only contains static methods. First, locate the Math class. In which Java package can you find the Math class?

_________________________________________________________________________

Scroll down to the Method Summary section of the Math class. Examine the first method called `abs()`. The left column contains `static double`. The word `double` tells us that the return type of the method is `double`. But what does `static` mean? Static tells us that this method does not act on an object from the
Math class but that we can just call this method whenever needed. First, answer these questions about abs():

Method return type: ________________________________________________________________

Required parameters for the method: _________________________________________________

Purpose of the method: _____________________________________________________________

Because abs() is a static method, to invoke the method you would use the class name and then the method. For example, executing System.out.println( Math.abs( 3-10 ) ); would result in printing 7.

Review the Math method ceil() and answer these questions:

Method return type: ________________________________________________________________

Required parameters for the method: _________________________________________________

Purpose of the method: _____________________________________________________________

Example of invoking the method: ______________________________________________________

What have you learned?
- The Java 2 API is divided into packages
- Packages contain classes
- Class names start with a capital letter
- Classes contain methods
- The name of the method is directly to the left of the open parenthesis
- All methods require parenthesis
- Parameters are specified with a type followed by an identifier
- All methods have a return type
- The return type of the method is located directly to the left of the method name