F

Using the Java API Documentation

F.1 Introduction

The Java class library contains thousands of predefined classes and interfaces that programmers can use to write their own applications. These classes are grouped into packages based on their functionality. For example, the classes and interfaces used for file processing are grouped into the java.io package, and the classes and interfaces for JavaFX GUI, graphics and multimedia are grouped into packages that begin with javafx. The Java API documentation lists the public and protected members of each class and the public members of each interface in the Java class library. The documentation overviews all the classes and interfaces, summarizes their members (i.e., the fields, constructors and methods of classes, and the fields and methods of interfaces) and provides detailed descriptions of each member. Most Java programmers rely on this documentation when writing programs. Normally, programmers would search the API to find the following:

- 1. The package that contains a particular class or interface.
- 2. Relationships between a particular class or interface and other classes and interfaces.
- 3. Class or interface constants—normally declared as public static final fields.
- 4. Constructors to determine how an object of the class can be initialized.
- 5. The methods of a class to determine whether they're static or instance methods, the number and types of the arguments you need to pass, the return types and any exceptions that might be thrown from the method.

In addition, programmers often rely on the documentation to discover classes and interfaces that they have not used before. For this reason, we demonstrate the documentation with classes you know and classes you may not have studied yet. We show how to use the documentation to locate the information you need to use a class or interface effectively.

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F.2 Navigating the Java API

To view the API documentation online, go to http://docs.oracle.com/javase/8/ docs/api/ (Fig. F.1).



Fig. F.I | Java API overview. (Courtesy of Oracle Corporation)

Frames in the API Documentation's index.html Page

The API documentation is divided into three frames (see Fig. F.1). The upper-left frame lists all of the Java API's packages in alphabetical order. The lower-left frame initially lists the Java API's classes and interfaces in alphabetical order. Interface names are displayed in italic. When you click a specific package in the upper-left frame, the lower-left frame lists the classes and interfaces of the selected package. The right frame initially provides a brief description of each package of the Java API specification—read this overview to become familiar wth the general capabilities of the Java APIs. If you select a class or interface in the lower-left frame, the right frame displays information about that class or interface.

Important Links in the index.html Page

At the top of the right frame (Fig. F.1), there are four links—**Tree**, **Deprecated**, **Index** and **HeIp**. The **Tree** link displays the hierarchy of all packages, classes and interfaces in a tree structure. The **Deprecated** link displays interfaces, classes, exceptions, fields, constructors and methods that should no longer be used. The **Index** link displays classes, interfaces, fields, constructors and methods in alphabetical order. The **HeIp** link describes how the API documentation is organized. You should probably begin by reading the **HeIp** page.

Viewing the Index Page

If you do not know the name of the class you're looking for, but you do know the name of a method or field, you can use the documentation's index to locate the class. The Index link is located near the upper-right corner of the right frame. The index page (Fig. F.2) displays fields, constructors, methods, interfaces and classes in alphabetical order. For example, if you're looking for Scanner method hasNextInt, but do not know the class name, you can click the H link to go to the alphabetical listing of all items in the Java API that begin with "h". Scroll to method hasNextInt (Fig. F.3). Once there, each method named hasNextInt is listed with the package name and class to which the method belongs. From there, you can click the class name to view the class's complete details, or you can click the method name to view the method's details.









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Viewing a Specific Package

When you click the package name in the upper-left frame, all classes and interfaces from that package are displayed in the lower-left frame and are divided into five subsections— Interfaces, Classes, Enums, Exceptions, Errors and Annotation Types—each listed alphabetically. For example, the contents of package javax.swing are displayed in the lower-left frame (Fig. F.4) when you click javax.swing in the upper-left frame. You can click the package name in the lower-left frame to get an overview of the package. If you think that a package contains several classes that could be useful in your application, the package overview can be especially helpful.



Fig. F.4 | Clicking a package name in the upper-left frame to view all classes and interfaces declared in this package. (Courtesy of Oracle Corporation)

Viewing the Details of a Class

When you click a class name or interface name in the lower-left frame, the right frame displays the details of that class or interface. First you'll see the class's package name followed by a hierarchy that shows the class's relationship to other classes. You'll also see a list of the interfaces implemented by the class and the class's known subclasses. Figure F.5 shows the beginning of the documentation page for class JButton from the javax.swing package. The page first shows the package name in which the class appears. This is followed by the class hierarchy that leads to class JButton, the interfaces class JButton implements and the subclasses of class JButton. The bottom of the right frame shows the beginning of class JButton's description. When you look at the documentation for an interface, the right frame does not display a hierarchy for that interface. Instead, the right frame lists the interface's superinterfaces, known subinterfaces and known implementing classes.

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Fig. F.5 | Clicking a class name to view detailed information about the class. (Courtesy of Oracle Corporation)

Summary Sections in a Class's Documentation Page

Other parts of each API page are listed below. Each part is presented only if the class contains or inherits the items specified. Class members shown in the summary sections are public unless they're explicitly marked as protected. A class's private members are not shown in the documentation, because they cannot be used directly in your programs.

- 1. The Nested Class Summary section summarizes the class's public and protected nested classes—i.e., classes that are defined inside the class. Unless explicitly specified, these classes are public and non-static.
- 2. The Field Summary section summarizes the class's public and protected fields. Unless explicitly specified, these fields are public and non-static. Figure F.6 shows the Field Summary section of class Color.
- **3.** The **Constructor Summary** section summarizes the class's constructors. Constructors are not inherited, so this section appears in the documentation for a class only if the class declares one or more constructors. Figure F.7 shows the **Constructor Summary** section of class JButton.

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Fig. F.6 | Field Summary section of class Color. (Courtesy of Oracle Corporation)

JButton (Java Platform SE		
javax.sql.rowset.s¢ javax.sql.rowset.s¢ javax.swing javax.swing.colorc	Constructor Summary	Constructor Summary section
InternalFrameFocu JApplet JButton JCheckBoxMenulite JColorChooser JComboBox JComboBox JComboBox JComboBox JDesktopPane JDialog JEdtorPane JFileChooser JFormattedTextFie JEormattedTextFie	Constructor and Description JButton () Creates a button with no set text or icon. JButton (Action a) Creates a button where properties are taken from the Action supplied. JButton (Icon icon) Creates a button with an icon. JButton (String text) Creates a button with Lext. JButton (String text, Icon icon) Creates a button with initial text and an icon.	Click the parameter type to load its page Click the constructor name to go to the Constructor Detail section, which provides additional information about the constructor

Fig. F.7 | **Constructor Summary** section of class JButton. (Courtesy of Oracle Corporation)

4. The Method Summary section summarizes the class's public and protected methods. Unless explicitly specified, these methods are public and non-static. Figure F.8 shows the Method Summary section of class Files.

The summary sections typically provide only a one-sentence description of a class member. Additional details are presented in the detail sections discussed next.

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Method	d Summary section	Click the method name to go to the Method Detail see which provides additional information about that metho
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java.nio.charset java.nio.file java.nio.file.attrit java.nio.file.spi	Method Summary Methods Medifics and Type	Method and Description
WatchEvent.Kir WatchEvent.Mc WatchKey WatchService	static long	copy (InputStream in, Path target, CopyOptionoptions) Copies all bytes from an input stream to a file.
Classes	static long	copy (Path source, OutputStream out) Copies all bytes from a file to an output stream.
FileStore FileSystem FileSystems	static Path	copy (Path source, Path target, CopyOption options) Copy a file to a target file.



Detail Sections in a Class's Documentation Page

After the summary sections are detail sections that normally provide more discussion of particular class members. There isn't a detail section for nested classes. When you click the link in the **Nested Class Summary** for a particular nested class, a documentation page describing that nested class is displayed. The detail sections are described below.

1. The Field Detail section provides the declaration of each field. It also discusses each field, including the field's modifiers and meaning. Figure F.9 shows the Field Detail section of class Color.

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java.nio.charset.spi java.nio.file java.nio.file.attribute java.nio.file.spi	Field Detail	Field Detail section
WatchEvent Kind	white	of each field
WatchEvent.Modifie WatchKey WatchService	public static final Color white	
Classes	The color white. In the delidar of top space.	
Files	WHITE	
FileSystems	public static final Color WHITE	



2. The **Constructor Detail** section provides the first line of each constructor's declaration and discusses the constructors. The discussion includes the modifiers of each constructor, a description of each constructor, each constructor's parameters and any exceptions thrown by each constructor. Figure F.10 shows the **Constructor Detail** section of class JButton.

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javax.sql.rowset javax.sql.rowset javax.swing javax.swing.bord	Constructor Detail	Constructor Detail section
	JButton	constructor
InternalFrameFo JApplet JButton JCheckBox	public JButton() Creates a button with no set text or icon.	
JColorChooser JComboBox JComponent	JButton	
JDesktopPane JDialog JEditorPane JFileChooser	public JButton(Icon icon) Creates a button with an icon.	

Fig. F.10 | **Constructor Detail** section of class JButton. (Courtesy of Oracle Corporation)

3. The Method Detail section provides the first line of each method. The discussion of each method includes its modifiers, a more complete method description, the method's parameters, the method's return type and any exceptions thrown by the method. Figure F.11 shows class ObjectInputStream's Method Detail section for the read method. The method details show you other methods that might be of interest (labeled as See Also). If the method overrides a method of the superclass, the name of the superclass method and the name of the superclass are provided so you can link to the method or superclass for more information.

Method **read** throws **IOException**. Click **IOException** to load the **IOException** class information page and learn more about the exception type (e.g., why such an exception might be thrown)

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ObjectInputStream (Java F ×			
← ◆ C docsoracle. java.awt.image renderable java.awt.image renderable java.awt.print java.beans bilferedReader BufferedReader ByteArrayOutputStream Console DataloputStream File FileDescriptor FileOutputStream FilePermission FileReader FileWriter	<pre>chm/javase/7/docs/api/ read public int read() throws IOException Reads a byte of data. This method will block if no input is available Specified by: read in interface ObjectInput Specified by: read in class InputStream Returns: the byte read, or -1 if the end of the stream is reached. Throws: IOException - If an I/O error has occurred.</pre>	@ ☆ ↓ =	Method Detail section Method read implements the read method in the interface ObjectInput Click the name of the method to view detailed information.

Fig. F.II | **Method Detail** section of class **ObjectInputStream**. (Courtesy of Oracle Corporation)

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As you look through the documentation, you'll notice that there are often links to other fields, methods, nested-classes and top-level classes. These links enable you to jump from the class you're looking at to another relevant portion of the documentation.