3.05 Virtual Lecture Notes

The Big Picture

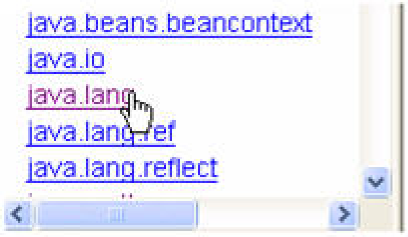
Most of the pre-written code you will use is contained in three packages of the Java API.

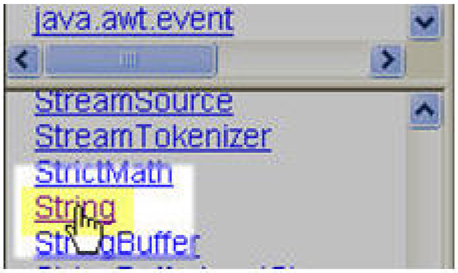
- **java.lang:** Provides classes that are fundamental to the design of the Java programming language.
- **java.util:** Contains the collections framework, legacy collection classes, event model, date and time facilities, internationalization, and miscellaneous utility classes.
- **java.io:** Provides for system input and output through data streams, serialization and the file system.

Since no program can run without the java.lang package, let's look at one of its most useful classes: the **`String`** class.

Scroll down in the packages frame and select the **`java.lang`** option.

The bottom left frame will list all of the classes, interfaces, and exceptions in the selected package (java.lang).



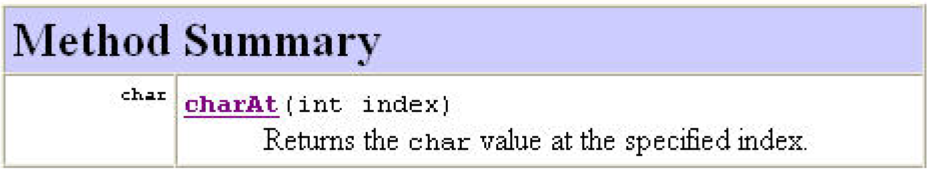


Scroll down in the bottom left frame and select the **`String`** class

The main window should change and provide *detailed* documentation about the **`String`** class. As you scroll down the main window, notice all of the **`String`** methods available to you and that the information is split into two sections: **Summary** and **Detail**.

The Method Summary

Scroll down in the main window until you reach the Method Summary table where each **`String`** class method is briefly described, one method per row. Find the **`charAt()`** method as shown below.



Method Summary	
char	charAt(int index) Returns the char value at the specified index.

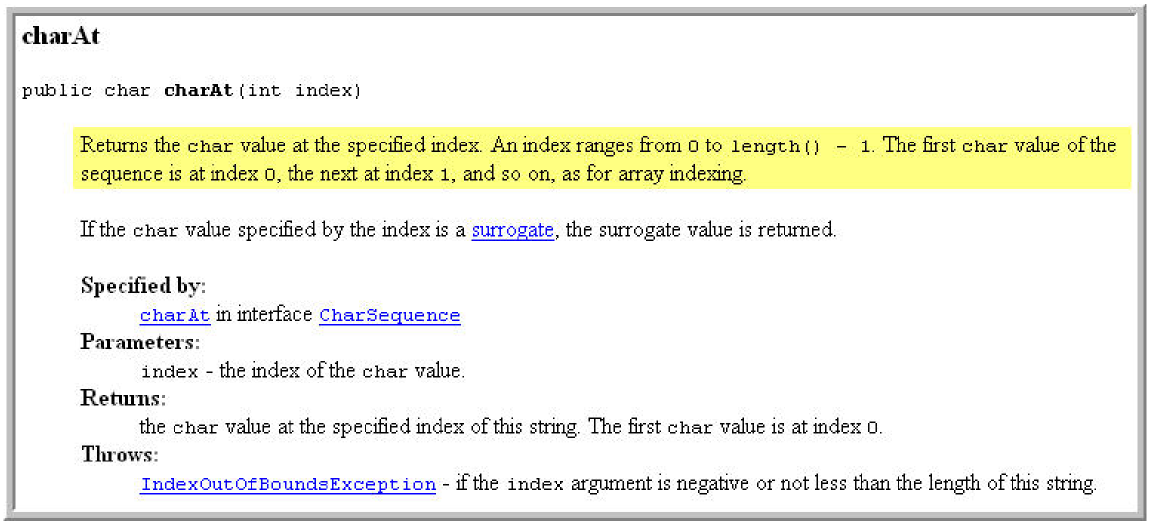
In the Method Summary view there will always be four pieces of information to notice, three on the right side of the vertical line and one on the left.

1. Every method has a name and a link (e.g. **charAt)**.
2. The summary indicates that the **charAt()** method returns the **char** value at the specified index position.
3. The information in parentheses **(int index)** indicates how many parameters the method takes and the parameter's type. The **charAt()** method takes one **int** parameter which is named index. (For now think of a parameter as the information a method needs to perform its task.)
4. The word **"char"** on the left side of the vertical line indicates that when the **charAt()** method is called, it will return a single character to the statement that called it.

The Method Summary in every class is organized exactly the same way. It is designed to give you an overview of how to use a method, but if you need additional information, you must consult the Method Detail section of the API.

Part 4: Method Detail

In the Method Summary, click on the **charAt()** link, and you will jump down to the Method Detail section as shown below.



charAt

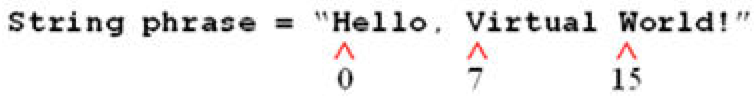
```
public char charAt(int index)
```

Returns the char value at the specified index. An index ranges from 0 to length() - 1. The first char value of the sequence is at index 0, the next at index 1, and so on, as for array indexing.

If the char value specified by the index is a surrogate, the surrogate value is returned.

Specified by:
charAt in interface CharSequence
Parameters:
index - the index of the char value.
Returns:
the char value at the specified index of this string. The first char value is at index 0.
Throws:
IndexOutOfBoundsException - if the index argument is negative or not less than the length of this string.

Something interesting to note is that 0, not 1, is the index position of the first character in a **String** literal. The index positions of several letters in the following String literal are indicated below.



```
String phrase = "Hello, Virtual World!"
```

The information supplied in the Method Detail table should be sufficient to use a method in a program.

The following code segment will print the character at the 0 index position in the phrase shown above.

```
int index = 0;
String phrase = “Hello, Virtual World!”;
char symbol = phrase.charAt(index);
System.out.print(“The character at the “);
System.out.println(“ position is: “ + symbol);
```

What do you predict would be printed for each of the following index positions in the **`String`** literal shown above?

0	8	6	10	0	1	9	1	20

The ability to use the Java API is critical to your ultimate success in computer programming. Spend some time exploring further and notice that each class is organized around a similar structure.