

25.7 Exploring a Class's Members and Viewing Documentation

[*Note:* This section may be read after studying [Chapter 6](#), [Methods: A Deeper Look](#), and the preceding portions of [Chapter 25](#).]

The preceding section introduced basic auto-completion capabilities. When using JShell for experimentation and discovery, you'll often want to learn more about a class before using it. In this section, we'll show you how to:

- view the parameters required by a method so that you can call it correctly
- view the documentation for a method
- view the documentation for a field of a class
- view the documentation for a class, and
- view the list of overloads for a given method.

To demonstrate these features, let's explore class `Math`. Start a new JShell session or `/reset` the current one.

25.7.1 Listing Class `Math`'s

static Members

As we discussed in [Chapter 6](#), class `Math` contains only `static` members—`static` methods for various mathematical calculations and the `static` constants `PI` and `E`. To view a complete list, type `"Math."` then press *Tab*:

jshell> Math.			
E	IEEEremainder(	PI	abs(
acos(	addExact(	asin(	atan(
atan2(	cbrt(	ceil(	class
copySign(	cos(	cosh(	decrementExact(
exp(	expm1(	floor(	floorDiv(
floorMod(	fma(	getExponent(	hypot(
incrementExact(	log(	log10(	log1p(
max(	min(	multiplyExact(	multiplyFull(
multiplyHigh(	negateExact(	nextAfter(	nextDown(
nextUp(	pow(	random()	rint(
round(	scalb(	signum(	sin(
sinh(	sqrt(	subtractExact(	tan(
tanh(	toDegrees(	toIntExact(	toRadians(
ulp(
jshell> Math.			

As you know, JShell auto-completion displays a list of

everything that can appear to the right of the dot (`.`). Here we typed a class name and a dot (`.`), so JShell shows only the class's `static` members. The names that are not followed by any parentheses (`E` and `PI`) are the class's `static` variables. All the other names are the class's `static` methods:

- Any method names followed by ()—only `random` in this case—do not require any arguments.
- Any method names followed by only an opening left parenthesis, (, require at least one argument or are overloaded.

You can easily view the value of the constants `PI` and `E`:

```
jshell> Math.PI
$1 ==> 3.141592653589793

jshell> Math.E
$2 ==> 2.718281828459045

jshell>
```

25.7.2 Viewing a Method's Parameters

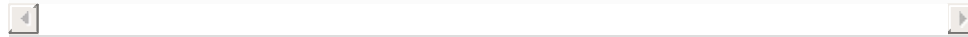
Let's assume you wish to test `Math`'s `pow` method (introduced in [Section 5.4.2](#)), but you do not know the parameters it requires. You can type

```
Math.p
```



then press *Tab* to auto-complete the name `pow`:

```
jshell> Math.pow(
```



Since there are no other methods that begin with "pow", JShell also inserts the left parenthesis to indicate the beginning of a method call. Next, you can type *Tab* to view the method's parameters:

```
jshell> Math.pow(  
double Math.pow(double a, double b)  
  
<press tab again to see documentation>  
  
jshell> Math.pow(
```




JShell displays the method's return type, name and complete parameter list followed by the next `jshell>` prompt containing what you've typed so far. As you can see, the method requires two `double` parameters.

25.7.3 Viewing a Method's Documentation

JShell integrates the Java API documentation so you can view documentation conveniently in JShell, rather than requiring


you to use a separate web browser. Suppose you'd like to learn more about `pow` before completing your code snippet. You can press *Tab* again to view the method's Java documentation (known as its javadoc)—we cut out some of the documentation text and replaced it with a vertical ellipsis (...) to save space (try the steps in your own JShell session to see the complete text):

```
jshell> Math.pow(
double Math.pow(double a, double b)
Returns the value of the first argument raised to the
second argument.Special cases:
    * If the second argument is positive or negative ze
      result is 1.0.
...
<press tab again to see next page>
```




For long documentation, JShell displays part of it, then shows the message

```
<press tab again to see next page>
```



You can press *Tab* to view the next page of documentation. The next `jshell>` prompt shows the portion of the snippet you've typed so far:

```
jshell> Math.pow(
```



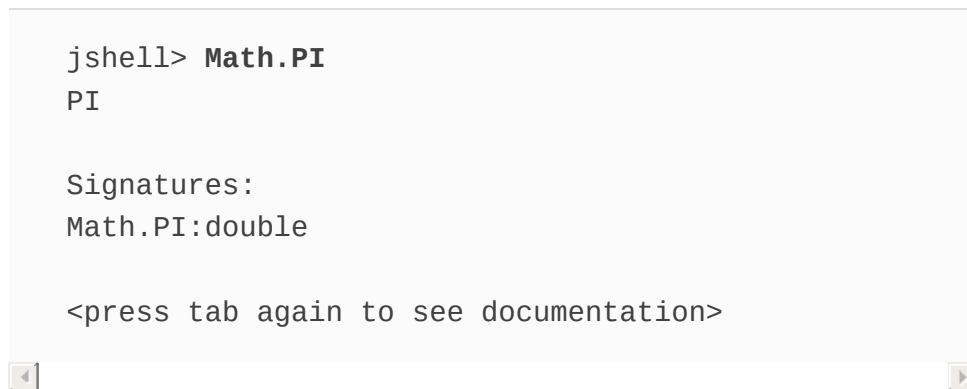
25.7.4 Viewing a public Field's Documentation

You can use the *Tab* feature to learn more about a class's public fields. For example, if you enter `Math.PI` followed by *Tab*, JShell displays

```
jshell> Math.PI
PI

Signatures:
Math.PI:double

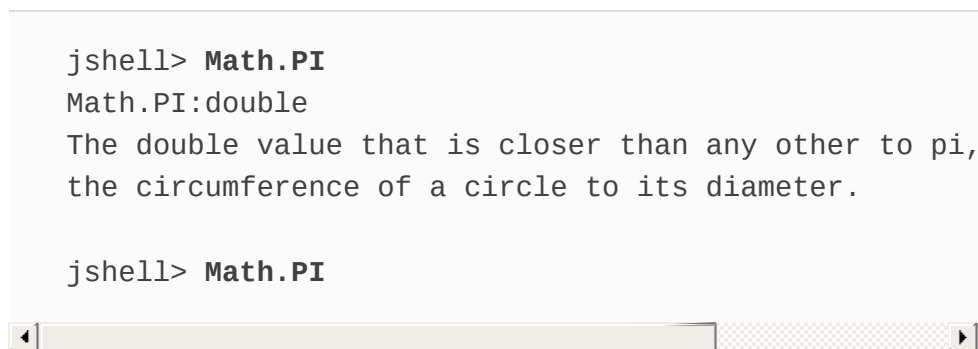
<press tab again to see documentation>
```



which shows `Math.PI`'s type and indicates that you can use *Tab* again to view the documentation. Doing so displays:

```
jshell> Math.PI
Math.PI:double
The double value that is closer than any other to pi,
the circumference of a circle to its diameter.

jshell> Math.PI
```



and the next `jshell>` prompt shows the portion of the snippet you've typed so far.

25.7.5 Viewing a Class's Documentation

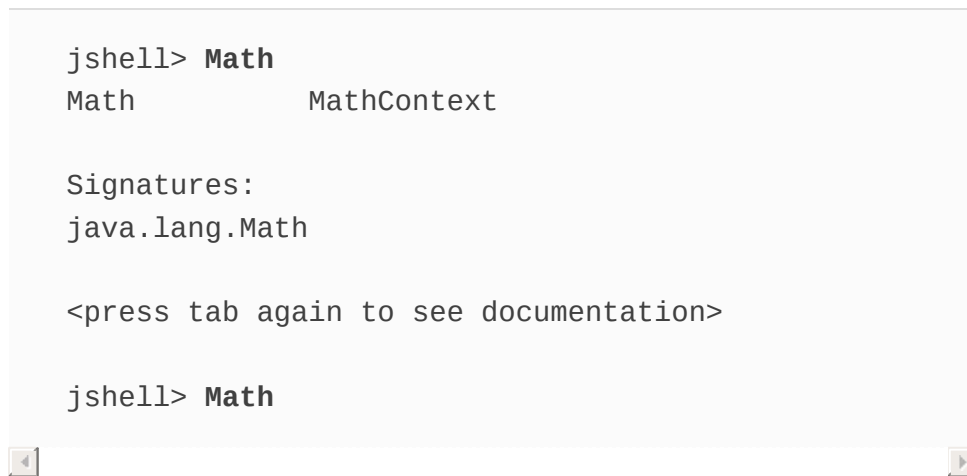
You also can type a class name then *Tab* to view the class's fully qualified name. For example, typing `Math` then *Tab* shows:

```
jshell> Math
Math          MathContext

Signatures:
java.lang.Math

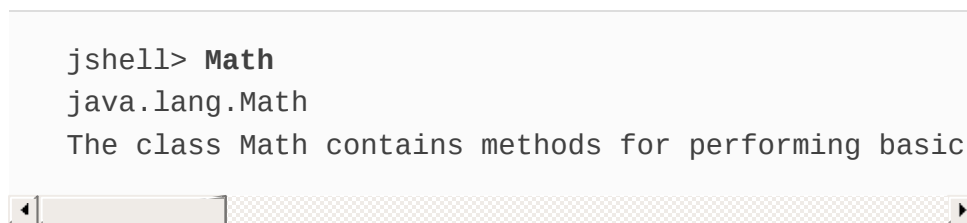
<press tab again to see documentation>

jshell> Math
```



indicating that class `Math` is in the package `java.lang`. Typing *Tab* again shows the beginning of the class's documentation:

```
jshell> Math
java.lang.Math
The class Math contains methods for performing basic
```



In this case, there is more documentation to view, so you can press *Tab* to view it. Whether or not you view the remaining documentation, the `jshell>` prompt shows the portion of the snippet you've typed so far:

```
jshell> Math
```

25.7.6 Viewing Method Overloads

Many classes have *overloaded* methods. When you press *Tab* to view an overloaded method's parameters, JShell displays the complete list of overloads, showing the parameters for every overload. For example, method `Math.abs` has four overloads:

```
jshell> Math.abs(  
$1    $2  
  
Signatures:  
int Math.abs(int a)  
long Math.abs(long a)  
float Math.abs(float a)  
double Math.abs(double a)  
  
<press tab again to see documentation>  
  
jshell> Math.abs(  
$1    $2
```

When you press *Tab* again to view the documentation, JShell shows you the *first* overload's documentation:

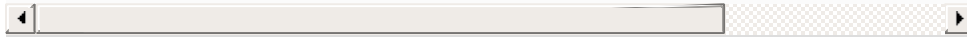
```
jshell> Math.abs(  
int Math.abs(int a)
```



```
Returns the absolute value of an int value. If the arg
negative, the argument is returned. If the argument i
the negation of the argument is returned.
```

```
...
```

```
<press tab again to see next page>
```



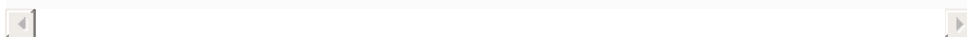
You can then press *Tab* to view the documentation for the next overload in the list. Again, whether or not you view the remaining documentation, the `jshell>` prompt shows the portion of the snippet you've typed so far.

25.7.7 Exploring Members of a Specific Object

The exploration features shown in [Sections 25.7.1–25.7.6](#) also apply to the members of a specific object. Let's create and explore a `String` object:

```
jshell> String dayName = "Monday"
dayName ==> "Monday"
```

```
jshell>
```



To view the methods you can call on the `dayName` object, type `"dayName."` and press *Tab*:

```
jshell> dayName.
```

```
charAt(
```

```
chars()
```

```
codePointAt(
```

codePointBefore(	codePointCount(	codePoints()
compareTo(	compareToIgnoreCase(	concat(
contains(	contentEquals(	endsWith(
equals(	equalsIgnoreCase(	getBytes(
getChars(	getClass()	hashCode()
indexOf(	intern()	isEmpty()
lastIndexOf(	length()	matches(
notify()	notifyAll()	offsetByCodePoints(
regionMatches(	replace(	replaceAll(
replaceFirst(	split(	startsWith(
subSequence(	substring(	toCharArray()
toLowerCase(	toString()	toUpperCase(
trim()	wait(
jshell> dayName.		

Exploring toUpperCase

Let's investigate the `toUpperCase` method. Continue by typing `"toU"` and pressing *Tab* to auto-complete its name:

```
jshell> dayName.toUpperCase(
toUpperCase(

jshell> dayName.toUpperCase(
```

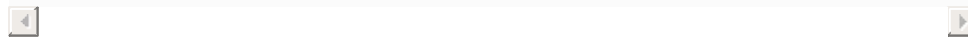


Then, type *Tab* to view its parameters:

```
jshell> dayName.toUpperCase(
Signatures:
String String.toUpperCase(Locale locale)
String String.toUpperCase()

<press tab again to see documentation>

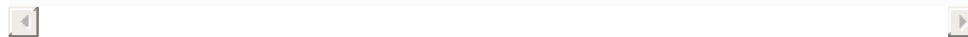
jshell> dayName.toUpperCase(
```



This method has two overloads. You can now use *Tab* to read about each overload, or simply choose the one you wish to use, by specifying the appropriate arguments (if any). In this case, we'll use the no-argument version to create a new `String` containing `MONDAY`, so we simply enter the closing right parenthesis of the method call and press *Enter*:

```
jshell> dayName.toUpperCase( )
$2 ==> "MONDAY"

jshell>
```



Exploring substring

Let's assume you want to create the new `String` `"DAY"`—a subset of the implicit variable `$2`'s characters. For this purpose class `String` provides the overloaded method

`substring`. First type `"$2.subs"` and press *Tab* to auto-complete its the method's name:

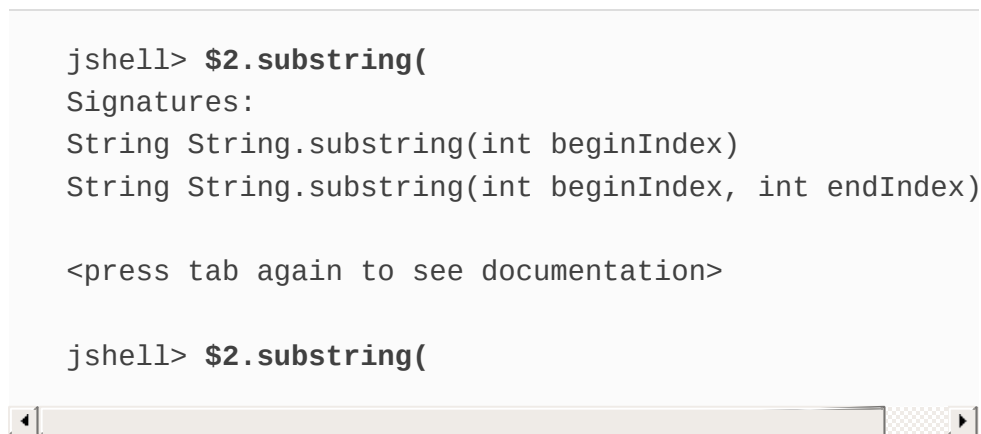
```
jshell> $2.substring(  
substring(  
  
jshell>
```



Next, use *Tab* to view the method's overloads:

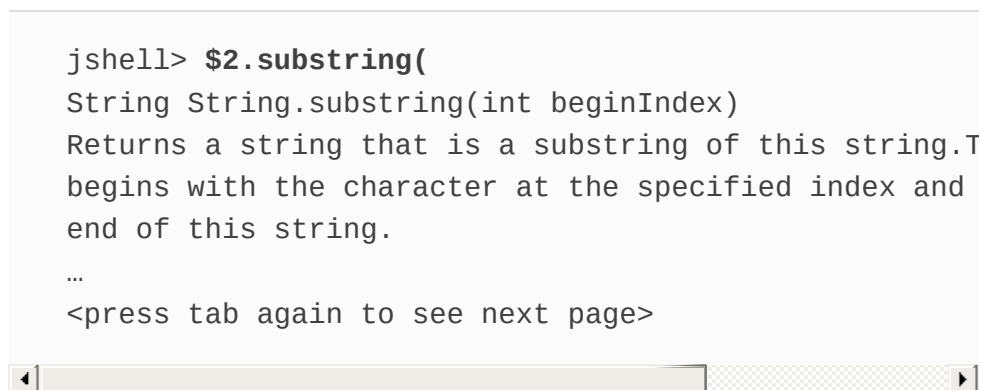
```
jshell> $2.substring(  
Signatures:  
String String.substring(int beginIndex)  
String String.substring(int beginIndex, int endIndex)  
  
<press tab again to see documentation>  
  
jshell> $2.substring(  

```



Next, use *Tab* again to view the first overload's documentation:

```
jshell> $2.substring(  
String String.substring(int beginIndex)  
Returns a string that is a substring of this string. T  
begins with the character at the specified index and  
end of this string.  
...  
<press tab again to see next page>
```



As you can see from the documentation, this overload of the

method enables you to obtain a substring starting from a specific character index (that is, position) and continuing through the end of the `String`. The first character in the `String` is at index 0. This is the version of the method we wish to use to obtain "DAY" from "MONDAY", so we can return to our code snippet at the `jshell>` prompt:

```
jshell> $2.substring(  

```

Finally, we can complete our call to `substring` and press *Enter* to view the results:

```
jshell> $2.substring(3)
```

```
$3 ==> "DAY"
```

```
jshell>
```