Nashorn: a JavaScript Engine on the JVM

A JavaScript Engine for the JVM

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Module Outline

- **REPL: Java in JavaScript**

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- ScriptEngine: Java in JavaScript

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- REPL: Java in JavaScript
- ScriptEngine: Java in JavaScript
- JavaScript and JavaFX

A JavaScript REPL

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- jjs is the REPL executable
- It is located in $JAVA_HOME/bin, in the same place as javac or java

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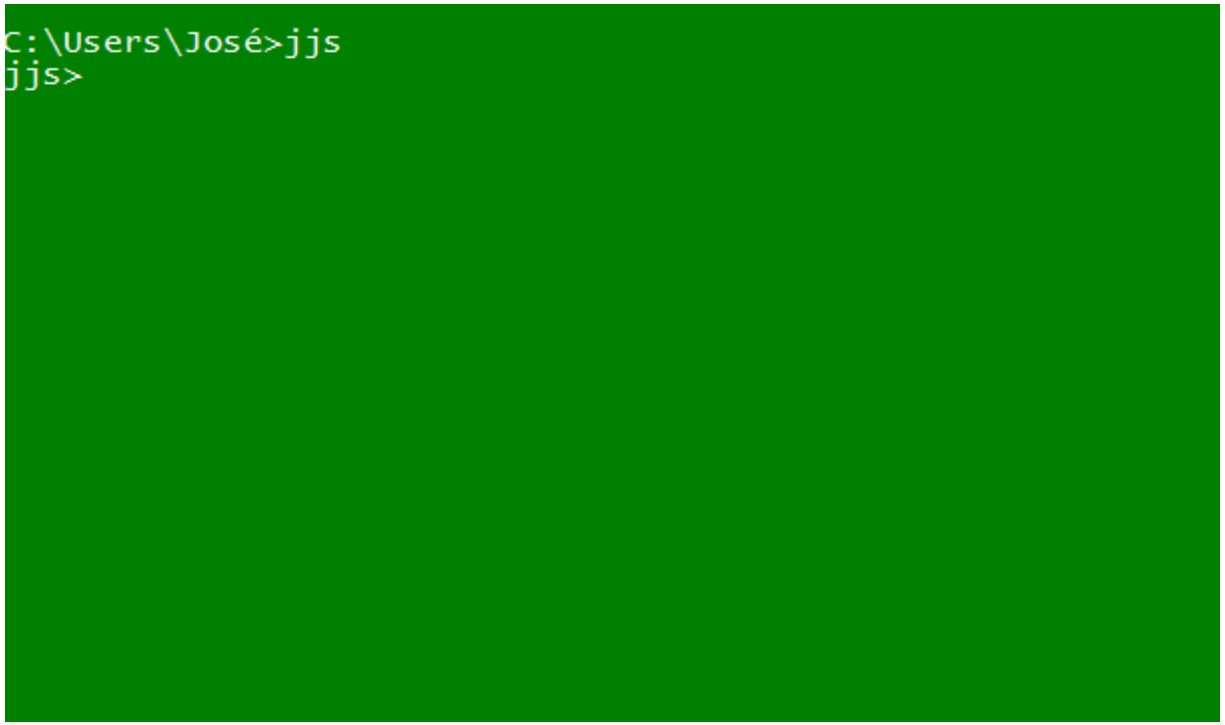

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```
jjs> 'Hello world!'.length()
12
jjs>
```

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```
jjs> function fibo(n) { return n <= 1 ? n : n + fibo(n - 1) }
function fibo(n) { return n <= 1 ? n : n + fibo(n - 1) }
jjs>fibo(100)
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jjs>
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jjs>function fact(n) { return n <= 1 ? n : n*fact(n - 1) }
function fact(n) { return n <= 1 ? n : n*fact(n - 1) }
jjs>fact(5)
120
jjs>
```

What Is a REPL?

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```
jjs>var s = new java.lang.String("Hello")
jjs>s
Hello
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```
jjs>var s = new java.lang.String("Hello")
jjs>s
Hello
jjs>s.toUpperCase()
HELLO
jjs>
```

The REPL

- The Nashorn REPL allows to interactively type in an execute Java and JavaScript

Running JavaScript in Java code

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ScriptEngine engine = manager.getEngineByName("nashorn");
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Object result = engine.eval("/* JavaScript code here */");
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```
Object result = engine.eval("/* JavaScript code here */");
```

- One can also pass JavaScript code through a file

```
Object result = engine.eval(Files.newBufferedReader(path));
```

How to Pass Objects to JavaScript

- Two ways of passing Java objects to the JavaScript engine
- Suppose we want to pass the Stage object (from JavaFX)
- 1st solution:

```
public void start(Stage stage) {
   engine.put("stage", stage);
   engine.eval(script); // script is my JavaScript code
}
```

- In this case the stage variable is available in the JavaScript « global scope »

How to Pass Objects to JavaScript

- Two ways of passing Java objects to the JavaScript engine
- Suppose we want to pass the Stage object (from JavaFX)
- 2nd solution: we want to scope our variable

```
Bindings scope = engine.createBindings();
scope.put("stage", stage);
engine.eval(script, scope);
```

- In this case the stage variable is only available in the scope defined by the scope object

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- But also this:

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stage.setTitle('This is JavaScript!')
```

- But also this:

```
stage.title = 'This is JavaScript!'
```

- And also this:

```
stage['title'] = 'This is JavaScript!'
```

Nashorn and JavaFX

Lauching a JavaFX Application Through Nashorn

- One can use jjs to launch a JavaFX application

```
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```

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- Nashorn will make the stage object available through $STAGE

```
var message =
   new javafx.scene.control.Label("This is JavaScript!");
message.font =
   new javafx.scene.text.Font(100);
$STAGE.scene = new javafx.scene.Scene(message);
$STAGE.title = "Hello World!";
```

Summary

- **Quick overview of Java / JavaScript integration using Nashorn**
- **How to type in JavaScript code through the REPL jjs**
  - How to use Java objects and classes in the JavaScript code
- **How to evaluate JavaScript code in a Java application**
  - How to pass Java objects in the JavaScript code
- **How to create a JavaFX application using JavaScript**

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- **Java FX**
- **Nashorn and JavaScript**