

JRuby (for Rubyists)

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You Should:



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- Have JRuby installed
- Have Java 1.6
- Run some examples

History

Bootstrapping



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(j)irb

```
> 1 + 1          logging  
=> 2            course  
> ary = []      install connections (JRuby + code)  
=> []           install JRuby-1.6.0.RC2  
> ary << [1,2,3] run JRB  
=> [[1, 2, 3]]  with JRuby & Swing  
> ary.flatten  uses  
=> [1, 2, 3]    objects  
> []           methods  
=> [1, 2, 3]    classes  
> []           Passing Ruby objects to Java  
Exercise: functional calculator in SWING  
Code: http://bit.ly/1DfWz
```

Using Java (Classes)

Importing



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```
1 require 'java'  
2  
3 import javax.swing.JFrame  
4  
5 frame = JFrame.new("Test")  
6 frame.default_close_operation =  
7   JFrame::EXIT_ON_CLOSE  
8 frame.setSize(450,450)  
9 frame.visible = true  
10
```

importing_classes.rb

By Package



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```
3 class TestUI
4   include_package "javax.swing"
5   include_package "java.awt"
6
7   def initialize
8     frame = JFrame.new("Test")
9     frame.default_close_operation =
10       JFrame::EXIT_ON_CLOSE
11     frame.setSize(450,450)
12
13   box = JTextField.new
14   box.maximum_size = Dimension.new(30,30)
15   frame.add box
16
17   frame.visible = true
18 end
19 end
20 TestUI.new
```

importing_by_package.rb

Subclassing



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```
1 require 'java'  
2 class RubyMap < java.util.HashMap  
3 end  
4  
5 p RubyMap.new.methods.grep(/key/).sort
```

subclassing.rb

Interfaces

```
3 class PressTheButtonUI
4   include_package 'javax.swing'
5   include_package 'java.awt.event'
6
7   #Implement an interface (optional)
8   include ActionListener
9
10  def initialize
11    frame = JFrame.new("Calculator")
12    frame.default_close_operation = JFrame::EXIT_ON_CLOSE
13    frame.setSize(450,450)
14    button = JButton.new("Press ME")
15    button.add_action_listener self
16    frame.add button
17    frame.visible = true
18  end
19
20  def actionPerformed(event)
21    puts event.source.label
22  end
23 end
```

interfaces.rb

Extensions



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```
3 JHashMap = java.util.HashMap
4
5 class JHashMap
6   def +(other)
7     map = JHashMap.new
8     map.put_all self
9     map.put_all other
10    map
11  end
12  def print
13    to_a.join(">")
14  end
15 end
16
17 one_two = JHashMap.new(:one => 1) +
18           JHashMap.new(:two => 2)
19
20 puts one_two.print
```

extensions.rb

Methods

```
1 require 'java'  
2 import javax.swing.JFrame  
3  
4 frame = JFrame.new("Test")  
5 #Java version  
6 frame.setSize(450,450)  
7 #Jruby's  
8 frame.set_size(450, 450)  
9  
10 #Java setter  
11 frame.setVisible true  
12 #JRuby's version  
13 frame.visible = true
```

methods.rb

Grid layout

```
3 class ButtonLayoutUI
4   include_package 'javax.swing'
5   include_package 'java.awt'
6
7   def initialize
8     frame = JFrame.new("Calculator")
9     frame.default_close_operation = JFrame::EXIT_ON_CLOSE
10    frame.setSize(100,100)
11    digits = JPanel.new
12    digits.layout = GridLayout.new 3, 3
13
14    (1..9).each do |n|
15      digits.add JButton.new n.to_s
16    end
17    frame.add digits
18    frame.visible = true
19  end
20 end
21 ButtonLayoutUI.new
```

layout.rb

Exercise

- Build a Calculator UI
- Using calculator.rb

```
9 require 'java'  
10 require 'calculator'  
11  
12 class CalculatorUI  
13   def initialize  
14     @calculator = Calculator.new  
15   end  
16 end  
17  
18 CalculatorUI.new
```

calculator_ui_exercise.rb

```
1 require 'java'  
2  
3 # Usage:  
4 #  
5 # calculator = Calculator.new  
6 #  
7 # calculator.evaluate("1")  
8 # calculator.evaluate("+")  
9 # calculator.evaluate("1")  
10 # calculator.evaluate("=")  
11 # 2 == calculator.current_value  
12 #  
13 class Calculator  
14   OPERATORS = ["+", "-", "/", "*"]  
15   FUNCTIONS = ["=", "CE"]  
16   OPERATIONS = OPERATORS + FUNCTIONS
```

calculator.rb



BREAK TIME



Deploying (Rails)



Warbler

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warble - T

```
warble compiled           # Feature: precompile all Ruby files
warble config              # Generate a configuration file to customize your war
warble executable          # Feature: make an executable archive
warble gemjar               # Feature: package gem repository inside a jar
warble pluginize            # Install Warbler tasks in your Rails application
warble version              # Display version of Warbler
warble war                  # Create the project .war file
warble war:clean             # Remove the .war file
warble war:debug             # Dump diagnostic information
```



JRuby Rack



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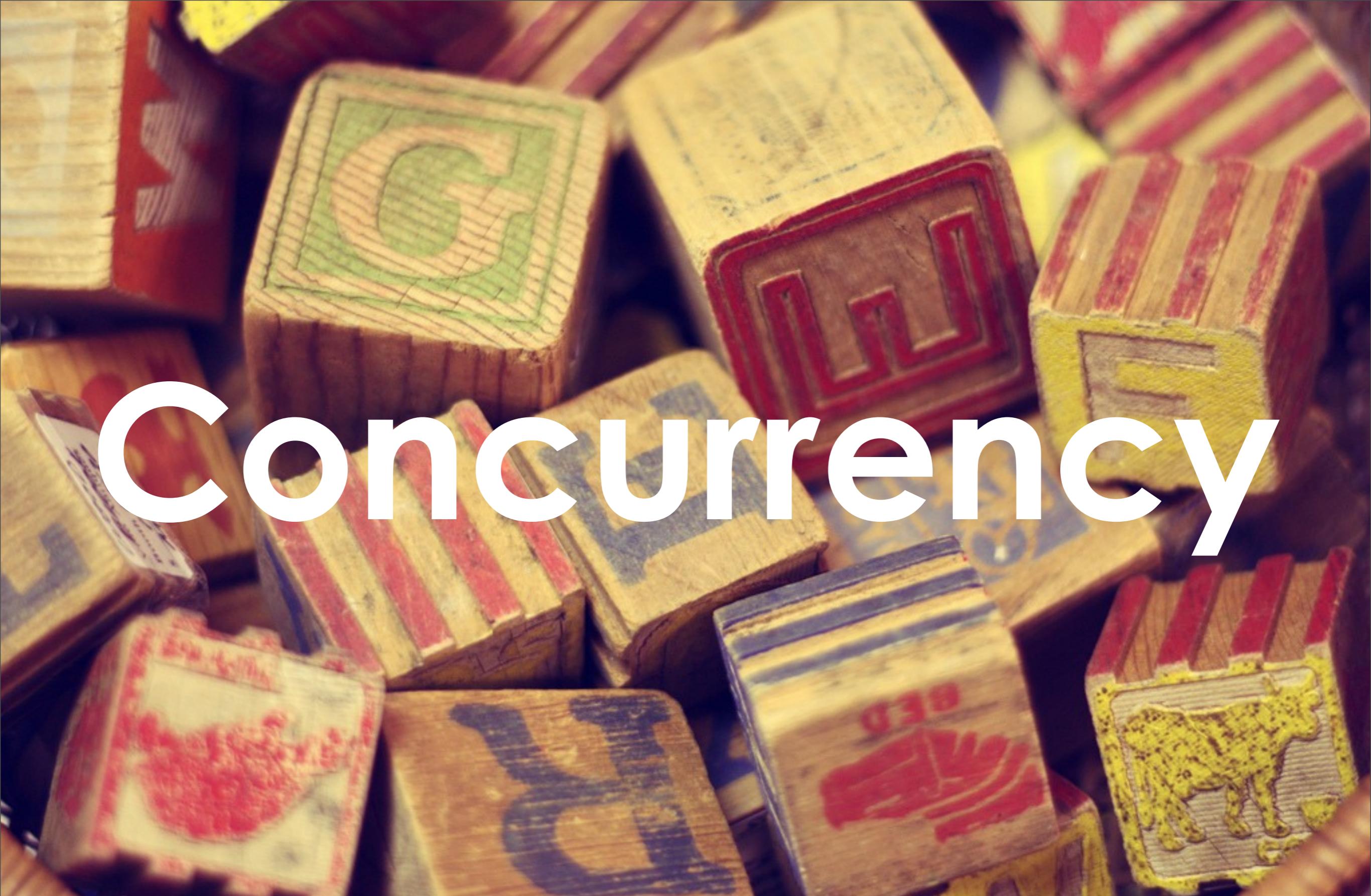


Excercise



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Concurrency





In Rails



```
38 # config.action_mailer.raise_delivery_errors = true  
39  
40 # Enable threaded mode  
41 config.threadsafe!  
42  
43 # Enable locale fallbacks for I18n (default: true)
```

config/environments/production.rb



3 Ways

1: Immutable

2: Mutex



```
1 require 'thread'
2 semaphore = Mutex.new
3
4 a = Thread.new {
5   semaphore.synchronize {
6     # access shared resource
7   }
8 }
9
10 b = Thread.new {
11   semaphore.synchronize {
12     # access shared resource
13   }
14 }
```

threads/mutex.rb

3: Threadlocal

```
1 a = Thread.new { Thread.current["name"] = "A"; Thread.stop }
2 b = Thread.new { Thread.current[:name] = "B"; Thread.stop }
3 c = Thread.new { Thread.current["name"] = "C"; Thread.stop }
4
5 Thread.list.each {|x| puts "#{x.inspect}: #{x[:name]}"} 
```

threads/threadlocal.rb



Exercise

```
2 require 'thread'  
3  
4 output, threads = [], []  
5 string = "Don't muddle me up!!\n"  
6  
7 100.times do |t|  
8   threads << Thread.start do  
9     100.times do  
10       string.each_char do |c|  
11         output << c  
12       end  
13     end  
14   end  
15 end  
16  
17 threads.each { |t| t.join}  
18 puts output.join.split("\n").reject{|s| s == string.strip}  
19
```

threads/concurrency_exercise.rb

A photograph of a lush, green forest. In the foreground, a stream flows over mossy rocks, its motion blurred by a long exposure. The background is filled with tall trees and dense foliage, with sunlight filtering through the canopy.

Tuning JRuby



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A photograph of a lush, green forest. A river or stream flows through the center of the frame, its water appearing smooth and light blue due to a long exposure effect. Large, moss-covered rocks are scattered along the water's path. The forest is filled with tall trees, their branches reaching out over the rocks and water. The overall atmosphere is mysterious and serene.

JIT

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optimization



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--help



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- Pass JVM options
 - -J[java options]
- Ruby compatibility
 - --1.9, --1.8
- JVM mode
 - --server, --client

- 
- A photograph of a lush, green forest. A river or stream flows through the center of the frame, its water appearing smooth and slightly blurred, suggesting a slow shutter speed. The banks of the stream are covered in thick moss and rocks. In the background, more trees and foliage are visible through a layer of mist or fog, creating a sense of depth and mystery.
- Eval
 - -e “puts ‘hello’”



--properties

- 
- Specify them:
 - `-J-D<prop>=<value>`

- JIT compilation
- `jruby.compile.mode`
- JIT threshold
- `jruby.jit.threshold`
- JIT max methods
- `jruby.jit.max`

- 
- A photograph of a lush, green forest. In the foreground, a stream flows over mossy rocks, its motion blurred by a long exposure. The background is filled with tall trees and thick foliage, creating a sense of depth and mystery. The overall atmosphere is cool and serene.
- Stand up classes
 - jruby.reify.classes



Java Props



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- 
- The background of the slide is a photograph of a lush, green forest. A river or stream flows through the center of the frame, its water appearing blurred due to motion, suggesting a slow shutter speed. The banks of the stream are covered in thick moss and rocks. In the distance, more trees and hills are visible through a layer of fog or mist.
- Specify them:
 - `-J<prop>=<value>`
 - `-J-X<prop>=<value>`

- Min heap
- `-Xms<size>` (min)
- Max heap
- `-Xmx<size>` (max)
- Max Permgen
- `-XX:MaxPermSize`



Exercise

optimization/start_rails.sh

optimization/benchmark_rails.rb



Profiling



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A photograph of a lush, green forest. A river or stream flows through the center of the frame, its water appearing smooth and light blue due to a long exposure effect. The banks of the stream are covered in large, mossy rocks. The background is filled with tall trees and dense foliage, with sunlight filtering through the canopy in bright, dappled rays.

Native



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- 
- Profile
 - --profile
 - --profile.flat
 - --profile.graph

Exercise

`profiling/start_rails.sh`

`profiling/benchmark_rails.rb`

Stickshift

source: <https://github.com/nicksieger/stickshift>

```
1 task :sleep => :snooze do
2   sleep 1
3 end
4 task :snooze do
5   sleep 2
6 end
7 task :default => :sleep
8
9 require 'stickshift'
10 ::Rake::Application.instrument :top_level
11 ::Rake::Application.instrument [], :with_args => 0
12 ::Rake::Task.instrument :invoke, :execute, :inspect_self => true
```



```
14 0ms > Rake::Application#top_level < 3001ms
15 0ms > Rake::Application#[]("default") < 0ms
16 0ms > Rake::Task#invoke{<Rake::Task default => [sleep]>} < 3001ms
17 0ms > Rake::Application#[]("sleep") < 0ms
18 0ms > Rake::Application#[]("snooze") < 0ms
19 2000ms > Rake::Task#execute{<Rake::Task snooze => []>} < 2000ms
20 1000ms > Rake::Task#execute{<Rake::Task sleep => [snooze]>} < 1000ms
21 [] 0ms > Rake::Task#execute{<Rake::Task default => [sleep]>} < 0ms
22
```



Nailgun



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JRuby startup is a little slow ...

```
time ruby -e "puts 'hello'"
```

real	0m1.424s
user	0m0.788s
sys	0m0.160s

Start an ng server

```
$ ruby --ng-server &
```

```
$ NGServer started on all interfaces, port 2113.
```

Much better with the --ng switch!

```
time ruby --ng -e "puts 'hello'"
```

real	0m0.292s
user	0m0.011s
sys	0m0.027s



Thank You!