I love the console!

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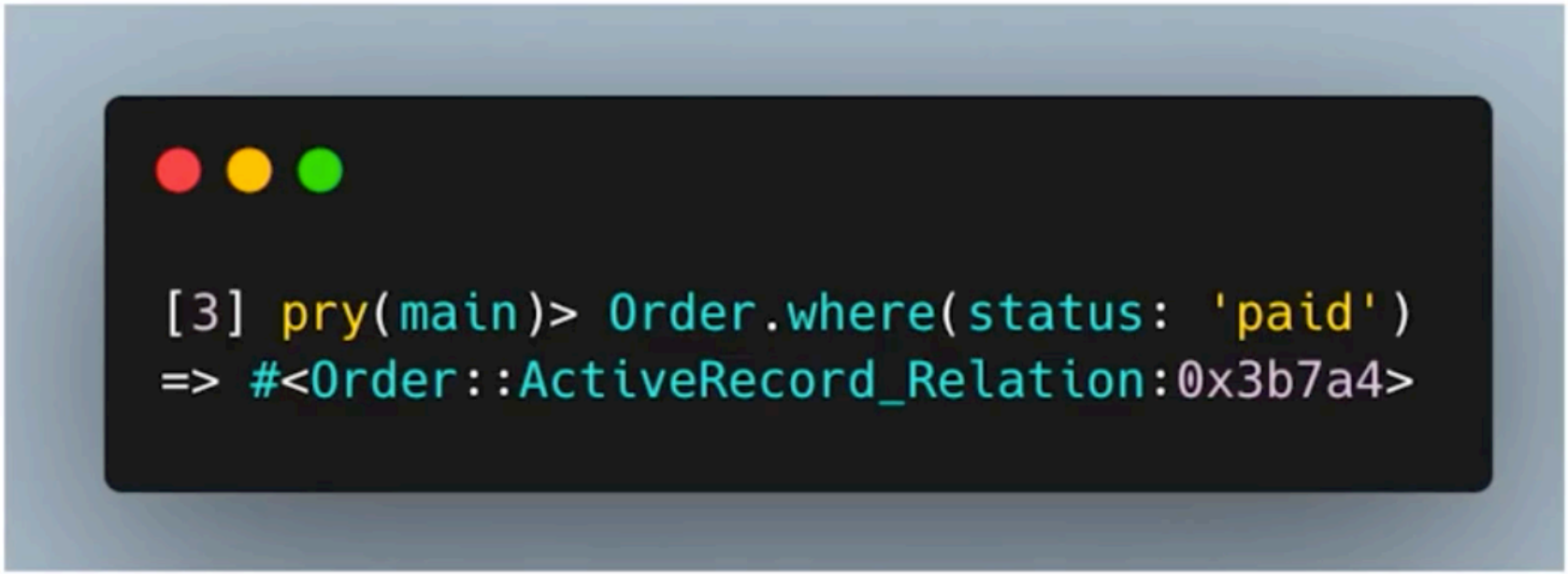
Deep Dive Into Our Console

Deep Dive Into Our Console

Tactics to Turbocharge your use of the Tool ⚡


$ rails c


[3] pry(main)> Order.where(status: 'paid')
=> #<Order::ActiveRecord_Relation:0x3b7a4>

We can define and evaluate Ruby methods and classes

```
irb(main):020:0> def full_name(first_name, last_name)
irb(main):021:1>   first_name + " " + last_name
irb(main):022:1>   end
=> :full_name
irb(main):023:0> full_name("Olivia", "Rodrigo")
=> "Olivia Rodrigo"
```

The console: the underdog

- Evaluate a piece of code in a specific context
- Context is configurable
- Requires little set up
- Quick feedback about Rails functionality and the data in our application

Let's find out!

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What Do you Get?

`irb`

Core Ruby Libraries

What Do you Get?

`irb`

Core Ruby Libraries

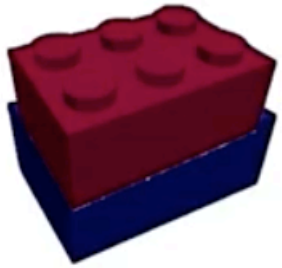
`bundle console`

Core Ruby Libraries
+
Gems from the Gemfile

What Do you Get?

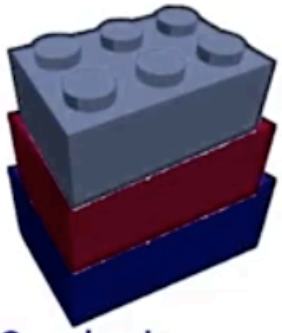
`irb`

Core Ruby Libraries



`bundle console`

Core Ruby Libraries
+
Gems from the Gemfile



`rails console`

Core Ruby libraries
+
Gems from the Gemfile
+
Rails Environment

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Storing Context

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```
irb(main):001:0> full_name
(irb):1:in `<main>': undefined local variable or method `full_name' for
main:Object (NameError)
    from
/Users/swetasanghavi/.rbenv/versions/3.0.2/lib/ruby/gems/3.0.0/gems/irb-
1.3.5/exe/irb:11:in    `<top (required)>'
    from /Users/swetasanghavi/.rbenv/versions/3.0.2/bin/irb:23:in `load'
    from /Users/swetasanghavi/.rbenv/versions/3.0.2/bin/irb:23:in `<main>'
```

We can define methods and classes in our console session

```
irb(main):020:0> def full_name(first_name, last_name)
irb(main):021:1>   first_name + " " + last_name
irb(main):022:1>   end
=> :full_name
irb(main):023:0> full_name("Olivia", "Rodrigo")
=> "Olivia Rodrigo"
```

IRB uses top-level Subsessions to save and differentiate context

```
Loading development environment (Rails 7.0.3)
[1] pry(main)>
```

We can spin up new subsessions with `irb`

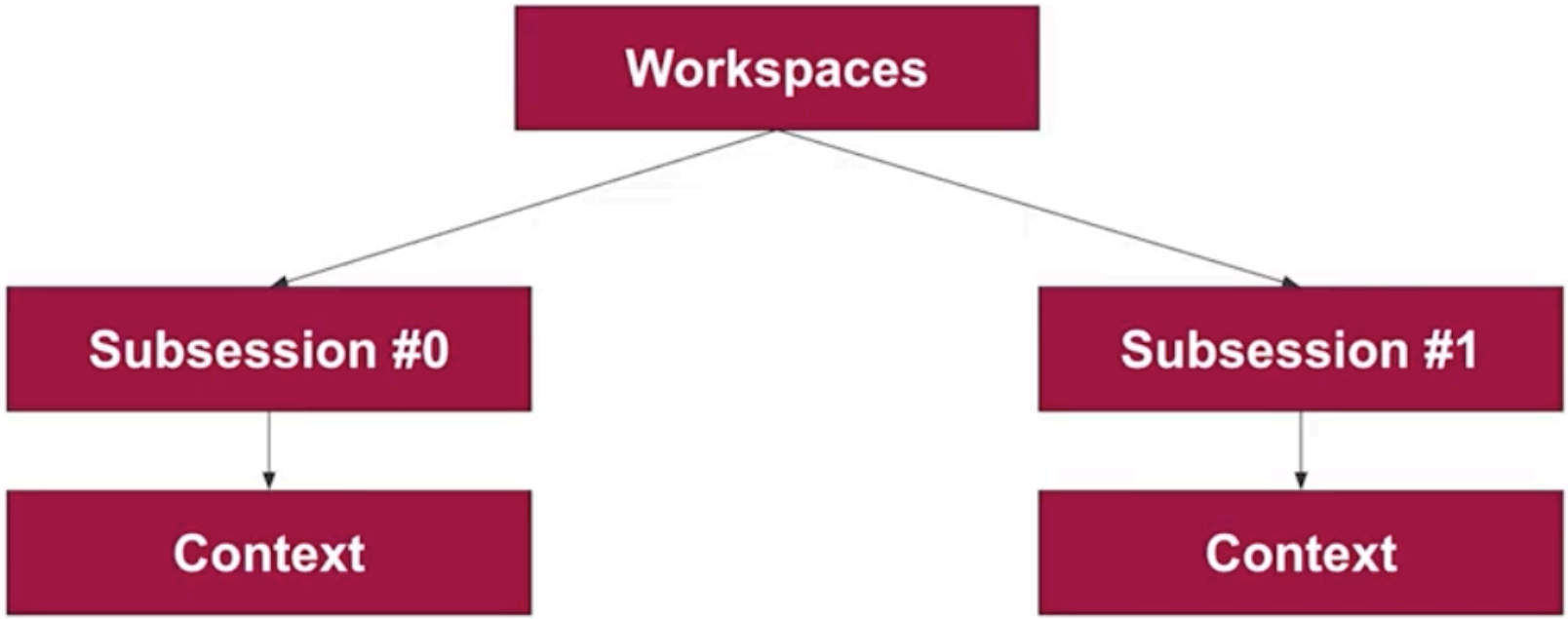
```
irb(main):024:0> irb
irb#1(main):001:0> jobs
=>
#0->irb on main (#<Thread:0x00007f8fb707bc70
sleep_forever>: stop)
#1->irb#1 on main (#<Thread:0x00007f8fb695f108
/Users/swetasanghavi/.rbenv/versions/3.0.2/lib/ruby/3.0.0/i
rb/ext/multi-irb.rb:192 run>: running)
```

Setting variables in a subsession

```
irb#1(main):003:0> fg 0
=> #<IRB::Irb: @context=#<IRB::Context:0x00007f8fb69d9fe8>,
@signal_status=:IN_EVAL, @scanner=#
<RubyLex:0x00007f8fb6a42bb0>>
irb(main):025:0> display_name = full_name("Olivia",
"Rodrigo")
=> "Olivia Rodrigo"
```

Once we switch subsessions, variables are not defined in the context

```
irb(main):026:0> fg 1
=> #<IRB::Irb: @context=#<IRB::Context:0x00007f8fb695ec08>,
@signal_status=:IN_EVAL, @scanner=#
<RubyLex:0x00007f8fb694b680>>
irb#1(main):004:0> display_name
(irb#1):4:in `<main>': undefined local variable or method
`display_name' for main:Object (NameError)
Did you mean?  display
irb#1(main):005:0> full_name("Grace", "Hopper")
=> "Grace Hopper"
```


Workspaces
Subsession #0
Subsession #1
Context
Context


Main
Top Level Context
Instance
Variables
Instance
Methods
Self

Execution Context

OR

The Binding Object

Parsing Ruby

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Console Evaluates Ruby

```
irb(main):020:0> def full_name(first_name, last_name)
irb(main):021:1>   first_name + " " + last_name
irb(main):022:1>   end
=> :full_name
irb(main):023:0> full_name("Olivia", "Rodrigo")
=> "Olivia Rodrigo"
```


Abstract Syntax Trees

- Parsers process code into an abstract syntax tree
- Low-level tree representation of the program's mechanics
- Simple data structures

In Ruby, Ripper outputs the trees for parsing

- Ripper library introduced to show us how Ruby is parsing Ruby
- Ripper provides an interface for parsing our program and tokenizing into a symbolic expression tree
- Returns abstract syntax trees or simple lexical analysis

Rippers #sexp method outputs a symbolic expression tree

```
Ripper#sexp(src, filename='-', lineno =1)
```

```
irb#1(main):013:0> Ripper.sexp("def full_name(first_name,
last_name) first_name + " " + last_name end")
```

```
irb#1(main):013:0> Ripper.sexp("def full_name(first_name,
last_name) first_name + " " + last_name end")
=>
[:program,
 [[:def,
   [:@ident, "full_name", [1, 4]],
   [:paren, [:params, [[:@ident, "first_name", [1, 14]],
[:@ident, "last_name", [1, 26]]], nil, nil, nil, nil, nil,
nil]],
   [:bodystmt, [[:binary, [:var_ref, [:@ident,
"first_name", [1, 37]]], :+, [:unary, :+@, [:var_ref,
[:@ident, "last_name", [1, 53]]]]]], nil, nil, nil]]]]
```

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```
irb#1(main):013:0> Ripper.sexp("def full_name(first_name,
last_name) first_name + " " + last_name end")
=>
[:program,
 [[:def,
   [:@ident, "full_name", [1, 4]],
   [:paren, [:params, [[:@ident, "first_name", [1, 14]],
[:@ident, "last_name", [1, 26]]], nil, nil, nil, nil, nil,
nil]],
   [:bodystmt, [[:binary, [:var_ref, [:@ident,
"first_name", [1, 37]]], :+, [:unary, :+@, [:var_ref,
[:@ident, "last_name", [1, 53]]]]]], nil, nil, nil]]]]
```

```
irb#1(main):013:0> Ripper.sexp("def full_name(first_name,
last_name) first_name + " " + last_name end")
=>
[:program,
 [[:def,
   [:@ident, "full_name", [1, 4]],
   [:paren, [:params, [[:@ident, "first_name", [1, 14]],
[:@ident, "last_name", [1, 26]]], nil, nil, nil, nil, nil,
nil]],
   [:bodystmt, [[:binary, [:var_ref, [:@ident,
"first_name", [1, 37]]], :+, [:unary, :+@, [:var_ref,
[:@ident, "last_name", [1, 53]]]]]], nil, nil, nil]]]]
```

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```
irb#1(main):013:0> Ripper.sexp("def full_name(first_name,
last_name) first_name + " " + last_name end")
=>
[:program,
 [[:def,
   [:@ident, "full_name", [1, 4]],
   [:paren, [:params, [[:@ident, "first_name", [1, 14]],
[:@ident, "last_name", [1, 26]]], nil, nil, nil, nil, nil,
nil]],
   [:bodystmt, [[:binary, [:var_ref, [:@ident,
"first_name", [1, 37]]], :+, [:unary, :+@, [:var_ref,
[:@ident, "last_name", [1, 53]]]]]], nil, nil, nil]]]]
```

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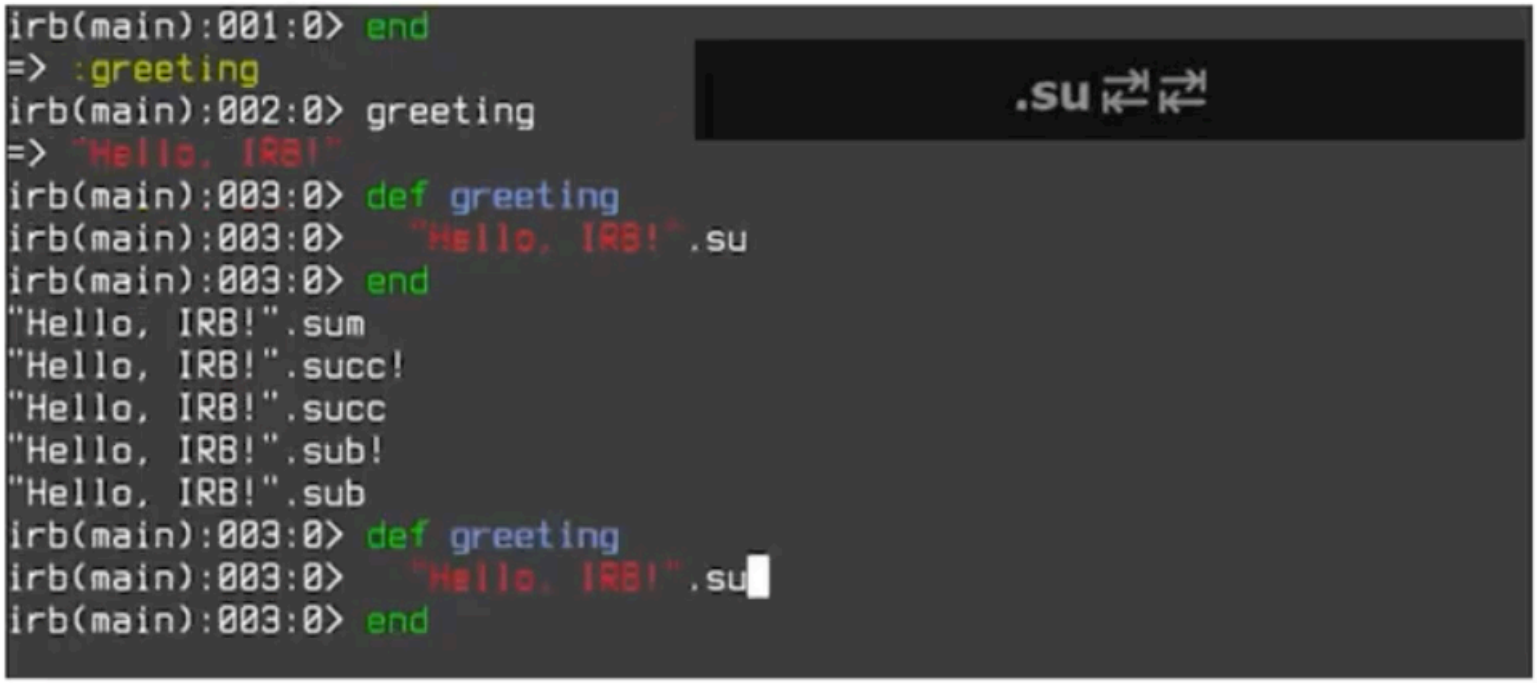
```
irb#1(main):013:0> Ripper.sexp("def full_name(first_name,
last_name) first_name + " " + last_name end")
=>
[:program,
 [[:def,
   [:@ident, "full_name", [1, 4]],
   [:paren, [:params, [[:@ident, "first_name", [1, 14]],
[:@ident, "last_name", [1, 26]]], nil, nil, nil, nil, nil,
nil]],
   [:bodystmt, [[:binary, [:var_ref, [:@ident,
"first_name", [1, 37]]], :+, [:unary, :+@, [:var_ref,
[:@ident, "last_name", [1, 53]]]]]], nil, nil, nil]]]]
```

Interactivity



gif from ruby/reline Github

gif from ruby/reline Github

GNU Readline

- Provides in-line editing and history capabilities
- Used across shells, the MySQL command-line tool, and the GNU Debugger among others
- Initial release in 1989

GNU Readline

- Provides in-line editing and history capabilities
- Used across shells, the MySQL command-line tool, and the GNU Debugger among others
- Initial release in 1989

Readline line editor was abstracted from GNU

- C library that ships in standard Ruby
- Provides interface for GNU Readline
- Facilitates completion
- Accesses input history from the Ruby interpreter

Reline

- Readline could only be used when GNU Readline is installed before Ruby builds
- Itoyanagi Sakura built a pure Ruby implementation of GNU Readline called Reline
- IRB started using Reline in Ruby 2.7
- In Ruby 3.0, Reline allows IRB to accommodate multiline editing command and auto-completion

Turbocharge ⚡

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Superpowers of Rails C

- Performance Improvement
- Debugging
- Product Development

Improving Performance

Rails semantic scopes can hide complexity

```
ProjectLead.sweet_spot.where(ended_at: Time.current)
```

Ruby's Benchmark module outputs time used to execute code

```
irb(main):006:0> Benchmark.measure { |x|
ProjectLead.sweet_spot.where(ended_at: Time.current) }
=> #<Benchmark::Tms:0x00007fcf595a08b8 @cstime=0.0,
@cutime=0.0, @label="", @real=0.00052169300033710 9,
@stime=0.0, @total=0.0, @utime=0.0>
```

`to_sql` outputs the SQL underlying your AR query

```
[2] pry(main)> ProjectLead.sweet_spot.where(ended_at:
Time.current).to_sql
=> "SELECT \"project_leads\".* FROM \"project_leads\" WHERE
(usd_amount > 10000 and project_leads.backer_count > 100)
AND \"project_leads\".\"ended_at\" = '2022-05-15
20:05:45.465750'"
```

```
[5] pry(main)> ProjectLead.sweet_spot.where(ended_at:
Time.current).explain
  ProjectLead Load (6.1ms)  SELECT "project_leads".* FROM
"project_leads" WHERE (usd_amount > 10000 and
project_leads.backer_count > 100) AND
"project_leads"."ended_at" = $1  [["ended_at", "2022-05-15
20:29:57.209094"]]
=> EXPLAIN for: SELECT "project_leads".* FROM
"project_leads" WHERE (usd_amount > 10000 and
project_leads.backer_count > 100) AND
"project_leads"."ended_at" = $1 [["ended_at", "2022-05-15
20:29:57.209094"]]
                                                QUERY PLAN
-----------------------------------------------------------
-------------------------------------------
 Index Scan using index_project_leads_on_ended_at on
project_leads  (cost=0.14..8.16 rows=1 width=4823)
   Index Cond: (ended_at = '2022-05-15
20:29:57.209094'::timestamp without time zone)
   Filter: ((usd_amount > '10000'::numeric) AND
(backer_count > 100))
(3 rows)
```

```
[5] pry(main)> ProjectLead.sweet_spot.where(ended_at:
Time.current).explain
  ProjectLead Load (6.1ms)  SELECT "project_leads".* FROM
"project_leads" WHERE (usd_amount > 10000 and
project_leads.backer_count > 100) AND
"project_leads"."ended_at" = $1  [["ended_at", "2022-05-15
20:29:57.209094"]]
=> EXPLAIN for: SELECT "project_leads".* FROM
"project_leads" WHERE (usd_amount > 10000 and
project_leads.backer_count > 100) AND
"project_leads"."ended_at" = $1 [["ended_at", "2022-05-15
20:29:57.209094"]]
                                                    QUERY PLAN
------------------------------------------------------------------
-----------------------------------------------
 Index Scan using index_project_leads_on_ended_at on
project_leads  (cost=0.14..8.16 rows=1 width=4823)
   Index Cond: (ended_at = '2022-05-15
20:29:57.209094'::timestamp without time zone)
   Filter: ((usd_amount > '10000'::numeric) AND
(backer_count > 100))
(3 rows)
```

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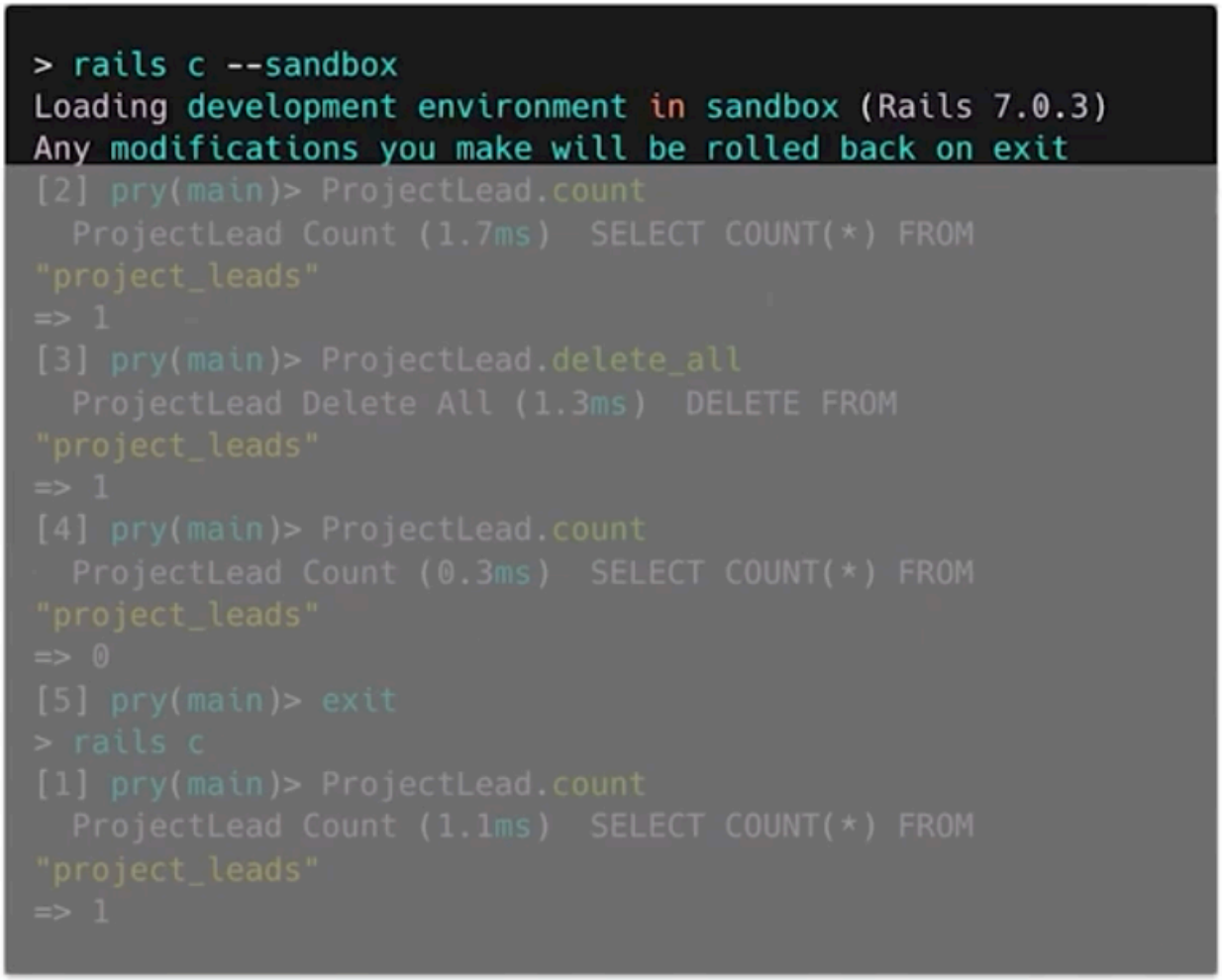
Console in Production

```
heroku run rails c -a production
```

Console in Sandbox Mode

```
rails console --sandbox
```


> rails c --sandbox
Loading development environment in sandbox (Rails 7.0.3)
Any modifications you make will be rolled back on exit
[2] pry(main)> ProjectLead.count
ProjectLead Count (1.7ms) SELECT COUNT(*) FROM "project_leads"
=> 1
[3] pry(main)> ProjectLead.delete_all
ProjectLead Delete All (1.3ms) DELETE FROM "project_leads"
=> 1
[4] pry(main)> ProjectLead.count
ProjectLead Count (0.3ms) SELECT COUNT(*) FROM "project_leads"
=> 0
[5] pry(main)> exit
> rails c
[1] pry(main)> ProjectLead.count
ProjectLead Count (1.1ms) SELECT COUNT(*) FROM "project_leads"
=> 1

Console allows you access production specific context

- Data Fixes
- Debugging

Use your console for fast experiments

```
[3] pry(main)> [].present?
=> false
[4] pry(main)> [].first
=> nil
```

Informing product decisions and impact with simple queries as a superpower

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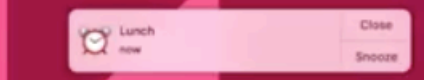

Cheatsheet

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Clearing the Console

```
CMD + K
```

Reload!

```
[2] pry(main)> reload!
Reloading...
=> true
[4] pry(main)> reload!; DataUpdater.new.call
Reloading...
```

Getting the value of the last evaluated item

```
[5] pry(main)> ProjectLead.last
  ProjectLead Load (0.7ms)  SELECT "project_leads".* FROM
"project_leads" ORDER BY "project_leads"."id" DESC LIMIT $1
[["LIMIT", 1]]
=> #<ProjectLead:0x00007fb3fd88d480
[10] pry(main)> lead = _
```

Reverse Command Search

```
CTRL + R
```

CMD + K	Clear your console before browser testing to confirm the user interaction maps to the rails logs
reload!	When you change your code while in a console session, reload! to get code changes
var = _	Last evaluated item in the console is automatically stored in the underscore
CTRL + R	Search back through the consoles input history to find previously used commands

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Welcome to my shout outs slide!

Like pairing? Like extreme programming? Like product ownership and experimentation? Like Crowdfunding? Like Tabletop games?

We're hiring!

BACKERKIT

CROWDFUNDED PROJECTS YOU CAN TRUST

WNB.rb

A virtual community for women and non-binary Rubyists.

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Thanks for ⚡ turbocharging ⚡ with me!

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