

Ruby is Awesome



Vitaly Kushner
astrails.com

History

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- Released in 1993
- Got known in US about 2000
- Gained momentum around 2003-2005

LISP

+

Smalltalk

+

Python

+

Perl

- Simple consistent syntax
- Dynamically typed
- Late binding
- Single Inheritance with Mixin support

- Everything is an object
- Closures
- Garbage Collection
- Multi platform

Ruby is **Awesome**

Blocks

```
array.each { |e| puts }
```

```
array.each { |e| puts e}
```

```
  array.each do |e|
```

```
    puts e
```

```
end
```

map	{ x ... }
collect	{ x ... }
select	{ x ... }
reject	{ x ... }
find	{ x ... }
any?	{ x ... }
all?	{ x ... }
sort	{ a, b ... }

```
File.readlines("foobar.dat").map{|l| l.strip}.sort {|x,y| x[-1] <=> y[-1]}.map {|x| x.upcase}.to_xml
```

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```
File.readlines("foobar.dat")
```

```
File.readlines("foobar.dat").map{|l| l.strip}.sort {|x,y| x[-1] <=> y[-1]}.map {|x| x.upcase}.to_xml
```

```
File.readlines("foobar.dat")  
  .map {|line| line.strip}
```



```
File.readlines("foobar.dat").map{|l| l.strip}.sort {|x,y| x[-1] <=> y[-1]}.map {|x| x.upcase}.to_xml
```

```
File.readlines("foobar.dat")  
  .map {|line| line.strip}  
  .sort {|x,y| x.to_i <=> y.to_i}
```

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File.readlines("foobar.dat").map{|l| l.strip}.sort {|x,y| x[-1] <=> y[-1]}.map {|x| x.upcase}.to_xml
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File.readlines("foobar.dat").map{|l| l.strip}.sort {|x,y| x[-1] <=> y[-1]}.map {|x| x.upcase}.to_xml
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```
File.readlines("foobar.dat")  
  .map {|line| line.strip}  
  .sort {|x,y| x.to_i <=> y.to_i}  
  .map {|x| x.upcase}  
  .to_xml
```

```
class Hash
  def to_html_attributes
    map { |k, v|
      k + '=' + v + ' '
    }.join(' ')
  end
end
```

```
attrs = {  
  :src => "foo.img",  
  :width => 100,  
  :height => 200,  
  :class => "avatar"  
}
```

```
attrs.to_html_attributes
```

```
=> 'class="avatar" height="200" width="100" src="foo.img"'
```

Closures

```
class Array
  def has_any_bigger_than(x)
    any? { |e| e > x }
  end
end
```

```
def incrementor(x)
  proc {|y| y + x}
end
```

```
inc1 = incrementor(1)
```

```
inc5 = incrementor(5)
```



```
def incrementor(x)
  proc {|y| y + x}
end
```

```
inc1 = incrementor(1)
```

```
inc1.call(1)
```

```
=> 2
```

```
inc1.call(3)
```

```
=> 4
```

```
def incrementor(x)
  proc {|y| y + x}
end
```

```
inc5 = incrementor(5)
```

```
inc5.call(1)
```

```
=> 6
```

```
inc5.call(3)
```

```
=> 8
```

```
# ruby
def paidMore(amount)
  proc { |e| e.salary > amount }
end
```

```
// C#
public Predicate<Employee> PaidMore
(int amount) {
  return delegate(Employee e) {
    return e.Salary > amount;
  }
}
```

Meta Programming

Extending the language
to create new
abstractions

Monkey Patching

```
class Hash
  def to_html_attributes
    map { |k, v|
      k + '=' + v + ' "'
    }.join(' ')
  end
end
```

```
attrs = {  
  :src => "foo.img",  
  :width => 100,  
  :height => 200,  
  :class => "avatar"  
}
```

```
attrs.to_html_attributes
```

```
=> 'class="avatar" height="200" width="100" src="foo.img"'
```


3 . megabytes

\Rightarrow 3145728

10.months.from_now

=> Thu Aug 12 03:25:40 0300 2010

5.minutes.ago

=> Mon Oct 12 03:21:02 0200 2009

Duck Typing

`.to_s`

`[1, 2, 3].to_s`

`=> "123"`

.to_s

123.to_s

=> "123"

.to_s

"123".to_s

=> "123"

"a#{b}c"

"a" + b.to_s + "c"

method_missing

NoMethodError

```
User.find_by_company("Astrails")
```

```
User.find_by_name_and_company(  
    "Vitaly Kushner", "Astrails")
```

Multiple inheritance is evil



Modules

a.k.a. Mixins

```
module FlyHome
  def set_home
    @home = position
  end

  def fly_home
    fly(@home)
  end
end
```

```
class Bird < Living
  include FlyHome
  def fly(direction) ...
  def position ...
end
```

```
class Airplane < Machine
  include FlyHome
  def fly(direction) ...
  def position ...
end
```


DSL

Domain Specific Language

```
class User < ActiveRecord::Base
  has_many :projects
  belongs_to :account
  has_many :reports,
    :class_name => "User",
    :foreign_key => :reports_to_id
  named_scope :activated,
    :conditions =>
      "activated_at IS NOT NULL"
  validates_uniqueness_of :name
  validates_presence_of :crypted_password
  validates_acceptance_of :terms_of_service
end
```

```
safe do
  local { path "/backup/:kind" }
  s3 :key => YOUR_S3_KEY,
     :secret => YOUR_S3_SECRET,
     :bucket => S3_BUCKET,
     :path => ":kind/"
  gpg :password => "foobar"

  mysqldump do
    options "-ceKq --single-transaction --create-options"
    user "astrails"
    password "foobar"

    database :blog
    database :astrails_com do
      skip_tables :request_logs
    end
  end

  tar do
    archive "etc-files" do
      files "/etc"
    end
  end

end
```

```
safe do
  local { path "/backup/:kind" }
  s3 :key => YOUR_S3_KEY,
    :secret => YOUR_S3_SECRET,
    :bucket => S3_BUCKET,
    :path => ":kind/"
  gpg :password => "foobar"

  ...
end
```

```
safe do
  ...
  mysqldump do
    options "-ceKq ..."
    user "astrails"
    password "foobar"

    database :blog
    database :astrails_com do
      skip_tables :request_logs
    end
  end
end
  ...
end
```

```
safe do
  ...

  tar do
    archive "etc-files" do
      files "/etc"
    end
  end
end

end
```

Rubygems

```
→ ~ X sudo gem install astrails-safe
Successfully installed astrails-safe-0.2.3
1 gem installed
Installing ri documentation for astrails-safe-0.2.3...
Installing RDoc documentation for astrails-safe-0.2.3...
→ ~ X
```


Rubyforge.org
8,426 gems

Github.com

7,483 gems

Rails



<http://www.flickr.com/photos/ecstaticist/2589723846/>

Rails is Fun

optimized for
programmers **happiness**
and sustainable
productivity

MVC

MVC

- Model

MVC

- Model
- View

MVC

- Model
- View
- Controller

convention over
configuration

```
class User < ActiveRecord::Base  
end
```

User.find(123)

=> SELECT * FROM `users` WHERE (`users`.`id` = 123)

```
class User < ActiveRecord::Base
  belongs_to :account
  has_many :projects
end
```

```
class UsersController < ApplicationController
  def show
    @user = User.find(params[:user])
    render :template => 'show'
  end
end
```

```
class User < ActiveRecord::Base
  belongs_to :account
  has_many :projects
end
```

```
class UsersController < ApplicationController
  def show
    @user = User.find(params[:user])
render :template => 'show'
  end
end
```

```
class User < ActiveRecord::Base
  belongs_to :account
  has_many :projects
end
```

```
class UsersController < ApplicationController
  def show
    @user = User.find(params[:user])
  end
end
```


Models



<http://www.flickr.com/photos/slyadnev/3959052112/>

ActiveRecord

ORM

Object-Relational Mapping

- MySQL
- PostgreSQL
- MSSql
- SQLite
- Oracle
- ODBC

Associations

```
class User < ActiveRecord::Base  
  has_many :projects  
end
```

```
class Project < ActiveRecord::Base  
  belongs_to :user  
end
```

```
u = User.find(1)
```

```
=> SELECT * FROM `users` WHERE (`users`.`id` = 1)
```

u.projects.count

=> `SELECT count(*) AS count_all FROM `projects` WHERE
(`projects`.user_id = 1)`


```
User.find_by_first_name("Vitaly", :include => :projects)
=> SELECT * FROM `users` WHERE
    (`users`.`first_name` = 'Vitaly') LIMIT 1
=> SELECT `projects`.* FROM `projects` WHERE
    (`projects`.user_id = 1)
```

Project.first.user

=> SELECT * FROM `projects` LIMIT 1

=> SELECT * FROM `users` WHERE (`users`.`id` = 1)

Callbacks

- before_validation
- before_validation_on_create
- after_validation
- after_validation_on_create
- before_save
- before_create
- after_create
- after_save

Callbacks

- **before_validation**
- before_validation_on_create
- **after_validation**
- after_validation_on_create
- **before_save**
- before_create
- after_create
- **after_save**

```
class User < ActiveRecord::Base
  before_save :encrypt_password
  attr_accessor :password
  private
  def encrypt_password
    unless password.blank?
      self.salt ||= ActiveSupport::SecureRandom.hex(40)
      self.crypted_password = encrypt(password, salt)
    end
  end
end
```

Validations

```
validates_presence_of :account_id  
validates_uniqueness_of :name  
validates_numericality_of :ccv
```

```
def validate  
  unless name[0] == ?A  
    errors.add(:name, "Names must start with an A")  
  end  
end
```

ActiveSupport

3.days.ago

[1,2,3].to_json

2.weeks.from_now

hash.slice(:foo, :bar)

Controllers



<http://www.flickr.com/photos/benjamin-nagel/2902721172/>

```
class UsersController < ApplicationController
  def index
    @users = User.paginate(:page => params[:page],
                          :per_page => 20)
  end
end
```

<http://yourdomain/users/index>

<http://localhost:3000/users/index>

```
ActionController::Routing::Routes.draw do |map|  
  map.connect ':controller/:action/:id'  
  map.connect ':controller/:action/:id.:format'  
end
```

```
ActionController::Routing::Routes.draw do |map|  
  map.connect ':controller/:action/:id'  
  map.connect ':controller/:action/:id.:format'  
end
```

/welcome/home

:controller => 'welcome'

:action => 'home'


```
ActionController::Routing::Routes.draw do |map|  
  map.connect ':controller/:action/:id'  
  map.connect ':controller/:action/:id.:format'  
end
```

`/users/edit/123`

`:controller => 'users'`

`:action => 'edit'`

`:id => '123'`

```
ActionController::Routing::Routes.draw do |map|  
  map.connect ':controller/:action/:id'  
  map.connect ':controller/:action/:id.:format'  
end
```

projects/show/456.xml

:controller => 'projects'

:action => 'show'

:id => '456'

:format => 'xml'

`/talks/create?title=ruby%20is%20awesome&author[name]=Vitaly&author[company]=Astrails`

```
{
  :controller => 'talks',
  :action => 'create',
  :title => "ruby is awesome",
  :user => {
    :name => 'Vitaly',
    :company => 'Astrails'
  }
}
```

REST

REST

Representational State Transfer

- HEAD
- GET
- POST
- PUT
- DELETE

- index

- new

- create

- show

- edit

- update

- destroy

index

GET /users

new

GET /users/new

create

POST */users*

show

GET /users/123

edit

GET /users/123/edit

update

PUT /users/123

destroy

DELETE /users/123

```
map.resources :users do |user|  
  user.resources :projects  
end
```

GET /users/**123**/projects

:controller => :projects, :action => :index, :user_id => **123**

GET /users/**123**/projects/**456**

:controller => :projects, :action => :show, :user_id => **123**, :id => **456**

users_path

=> /users

new_user_path
=> /users/new

user_path(user)

=> /users/123

edit_user_path(user)
=> /users/123/edit

Filters

```
class UsersController < ApplicationController
  before_filter :login_required,
    :except => [:new, :create]
  before_filter :find_user,
    :only => [:edit, :show, :update, :destroy]

  def index ...
  def new ...
  def create ...
  def edit ...
  def show ...
  def update ...
  def destroy ...

protected
  def login_required ...

  def find_user ...
end
```

```
class UsersController < ApplicationController
  before_filter :login_required,
    :except => [:new, :create]
  ...
protected
  def login_required
    unless session[:user_id]
      redirect_to "/login"
    end
  end
end
```

```
class UsersController < ApplicationController
  before_filter :find_user,
    :only => [:edit, :show, :update, :destroy]
  ...
protected
  def find_user
    @user = User.find(params[:id])
  end
end
```

```
def index
  @users = User.paginate(
    :page => params[:page], :per_page => 20)
end
```



```
def new
  @user = User.new(params[:user])
end
```

```
def create
  @user = User.new(params[:user])
  if @user.save
    flash[:notice] = "User created"
    redirect_to user_path(@user)
  else
    flash.now[:error] = "Failed to create a user"
    render :action => "new"
  end
end
```

```
def edit  
end
```

```
def show  
end
```

```
def update
  if @user.update_attributes(params[:user])
    flash[:notice] = "User updated"
    redirect_to user_path(@user)
  else
    flash.now[:error] = "Failed to update user"
    render :action => "edit"
  end
end
```

```
def destroy
  if @user.destroy
    flash[:notice] = "User deleted"
  else
    flash[:error] = "Failed to delete user"
  end
  redirect_to users_path
end
```

Errors

```
class UsersController < ApplicationController
  before_filter :find_user,
    :only => [:edit, :show, :update, :destroy]
  ...
  def update
    if @user.update_attributes(params[:user])
      ...
    end
  end
protected
  def find_user
    @user = User.find(params[:id])
  end
end
```


ActiveRecord::RecordNotFound

HTTP 404

HTTP 500

Session

Session Store

- files
- database
- cookie

```
class UserSessionController < ApplicationController
  def create
    unless user = User.authenticate(
      params[:login], params[:password])
      flash.now[:error] = "Login failed"
      render :action => :new
      return
    end

    session[:user_id] = user.id
    redirect_to user_path(user)
  end
end
```

MVC

Views



<http://www.flickr.com/photos/brapke/226101874/>

```
def index
  @users = User.paginate(
    :page => params[:page], :per_page => 20)
end
```

app/views/users/index.html.erb

ERB

```
<p>  
  Hello <%= h(@user.name) %>  
</p>
```

ERB

```
<ul>  
  <% @user.projects.each do |project| %>  
    <li><%= h(project.name) %></li>  
  <% end %>  
</ul>
```

```
def index
  @users = User.paginate(...)
  respond_to do |format|
    # default action is to render index.html.erb
    format.html
    format.xml { @users.to_xml }
    format.json { @users.to_json }
  end
end
```

HAML

```
%p  
  = @user.name
```

```
%ul  
  - @user.projects.each do |project|  
    %li= project.name
```

Testing

TDD

TDD

Test Driven Development

BDD

BDD

Behavior Driven Development

Pressure

TATFT

TATFT

Test All The Fucking Time

- Test::Unit
- RSpec
- Shoulda
- Cucumber
- Webrat


```
it "should be able to show media" do
  @media = stub_media
  Media.stub!(:find).and_return(@media)
  get :show, :id => @media.id
  response.should be_success
end
```

Migrations

```
class CreateProjects < ActiveRecord::Migration
  def self.up
    create_table :projects do |t|
      t.integer :user_id, :null => false
      t.string :title, :null => false
      t.text :description, :null => false
      t.integer :budget, :null => false

      t.timestamps
    end
  end

  def self.down
    drop_table :projects
  end
end
```

Plugins

inherited_resource

standard implementation for the 7 REST actions

acts_as_tree

db schema and methods for storing trees

country_select

HTML helper to present a select box of countries

Rails Scales?



<http://www.flickr.com/photos/pinksherbet/223270526/>

Rails Scales?

YES

LinkedIn's "Bumper Sticker"

More than **billion** page views per **month**

if you have **no**
scalability **problems**

you are **not growing** fast enough!

Ruby is Awesome

Q & A



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astrails.com