# Welcome!

# CSPP 52553

# Web Development

# Winter 2013

THE UNIVERSITY OF CHICAGO

# Week 1

- Introductions & Course Overview
- Ruby 101
- Unit Testing in Ruby
- Consuming JSON APIs in Ruby

# Course Overview

1. What are we going to do?

2. Where are we right now?

3. I want an *A*.  How do I get it?

4. Hold on - who *are* you people?

# Instructors

**Jeff Cohen**

Lecturer

**Brian Eng**

TA

**Raghu Betina**

TA

| | |
|---|---|
| Jeff | Wed 3:15pm - 5:15pm |
| Brian | Mon 2:00pm - 4:00pm |
| Raghu | *TBA* |

# Materials

## News, Slides, and Resources

`cspp52553.com`

## Q&A

`piazza.com`

# What Will We Build?

## 1. Web Applications

- "Dynamic"
- "Data-Backed"
- "User-Centric"

# What Will We Build?

## 2. Web Services

- "API"
- JSON, XML, CSV, ....
- "REST"

# How Will We Build All This Stuff?

# Grading

| | |
|---|---|
| Homework (first 5 weeks) | 20% |
| Midterm (week 6) | 30% |
| Final Project (week 11) | 50% |

# Grading

| | |
|---|---|
| Class Participation | ~ 0% |
| Homework (first 5 weeks) | 20% |
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| Final Project (week 11) | 50% |

# Prerequisites and Assumptions

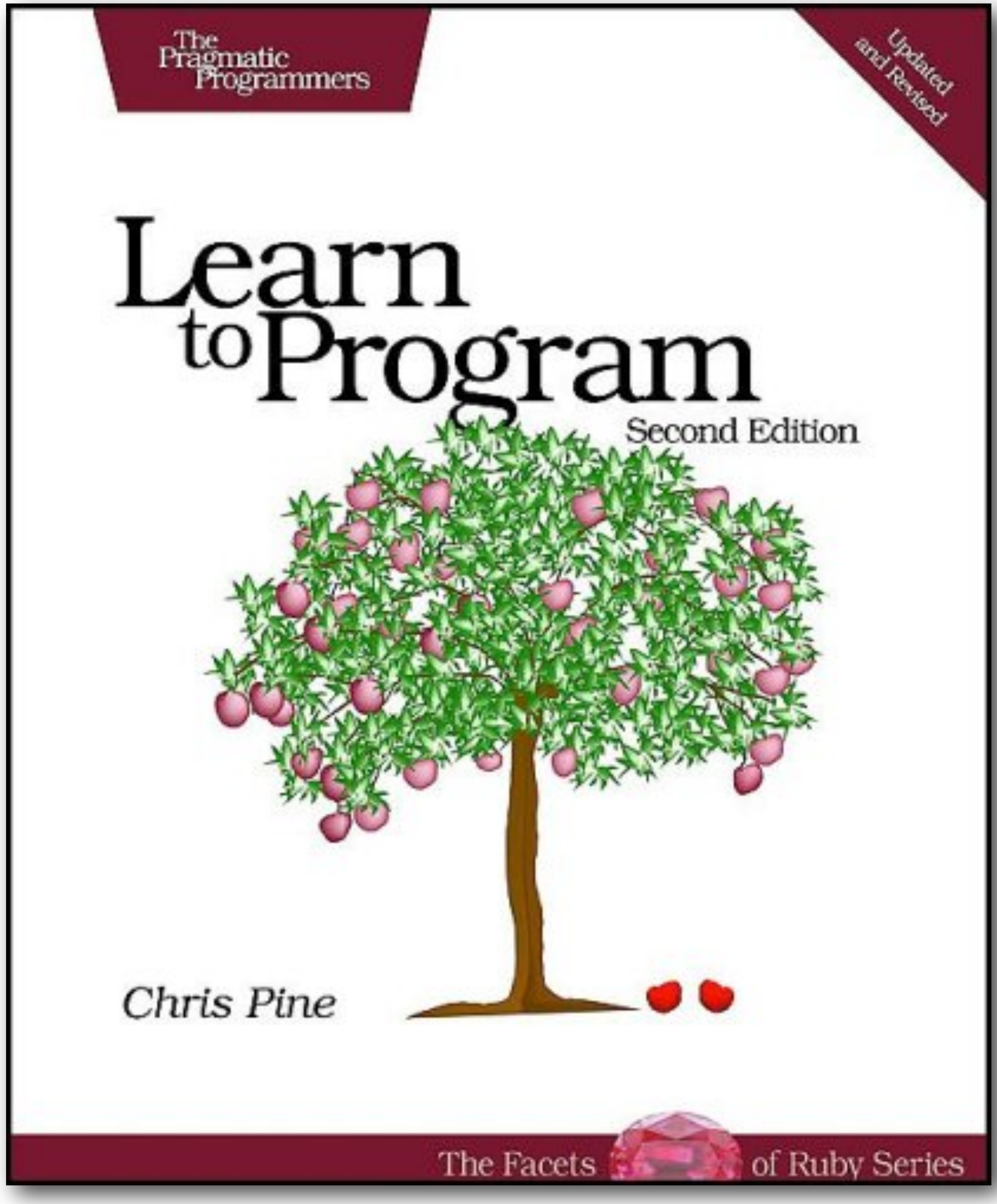
## Programming 101

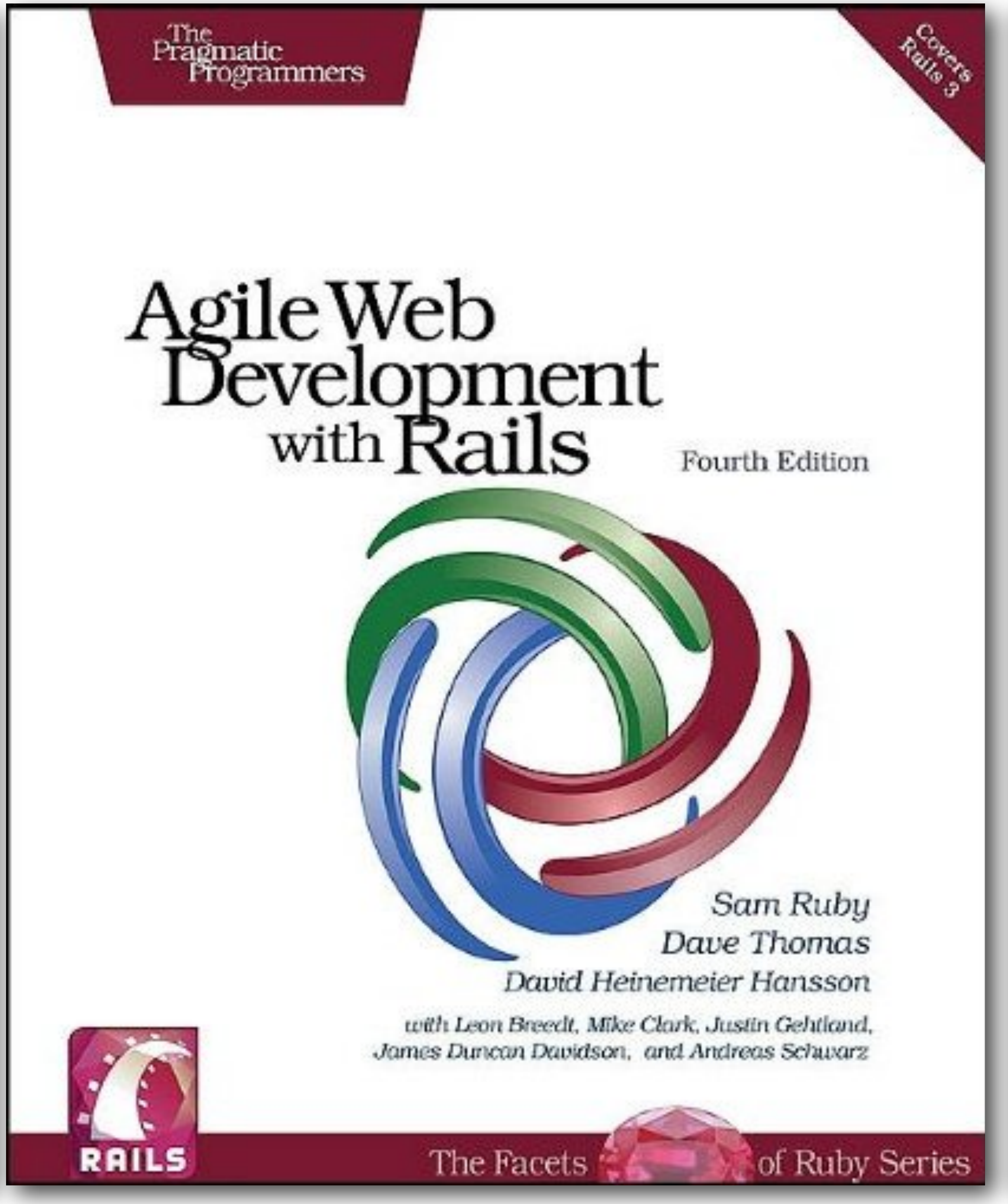
- Sequence of instructions
- Expressions
- Variables
- Data Structures
  - Strings
  - Arrays
  - Hashes/Maps/Dictionaries
- Methods (or functions)
- Loops

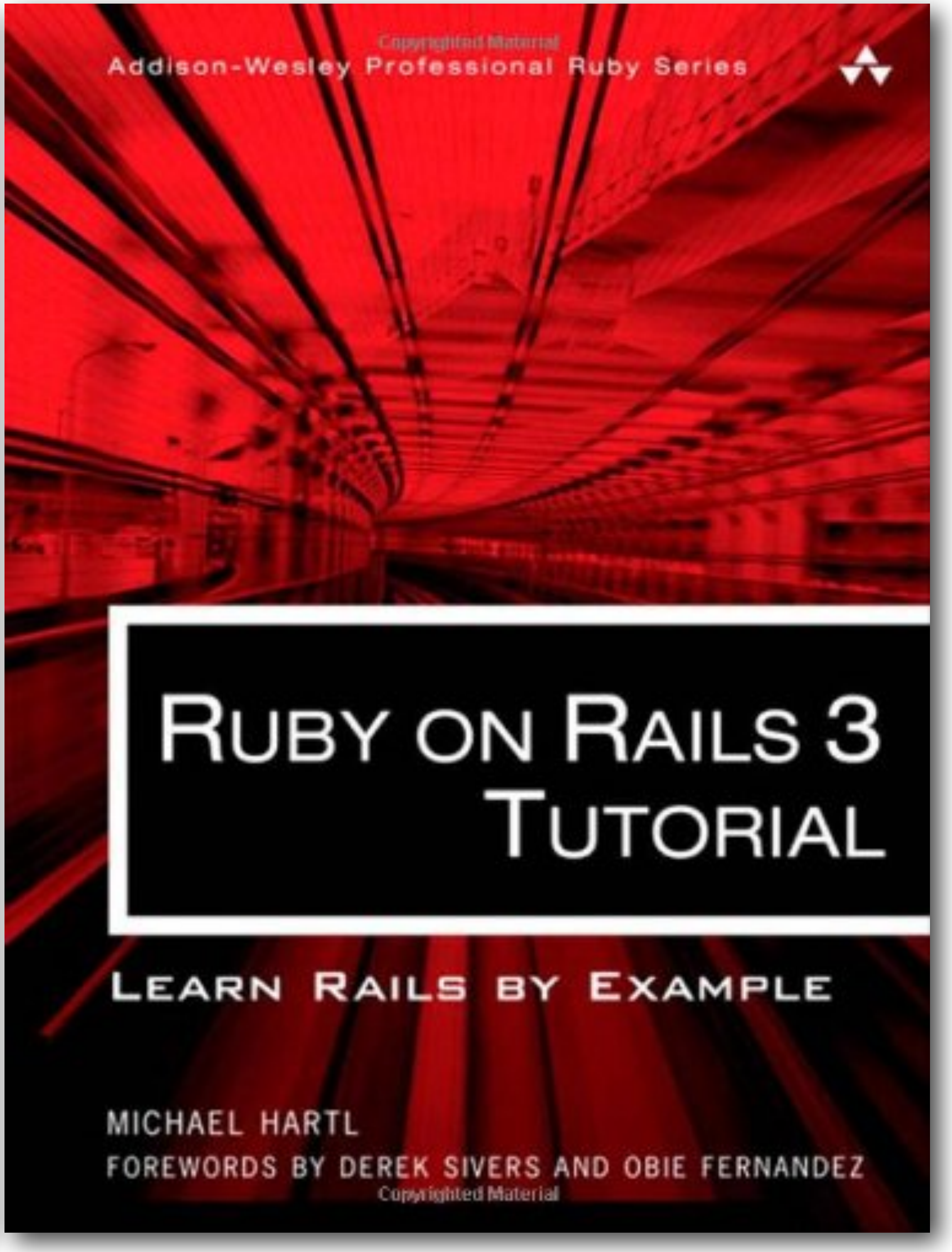
## OOP 101

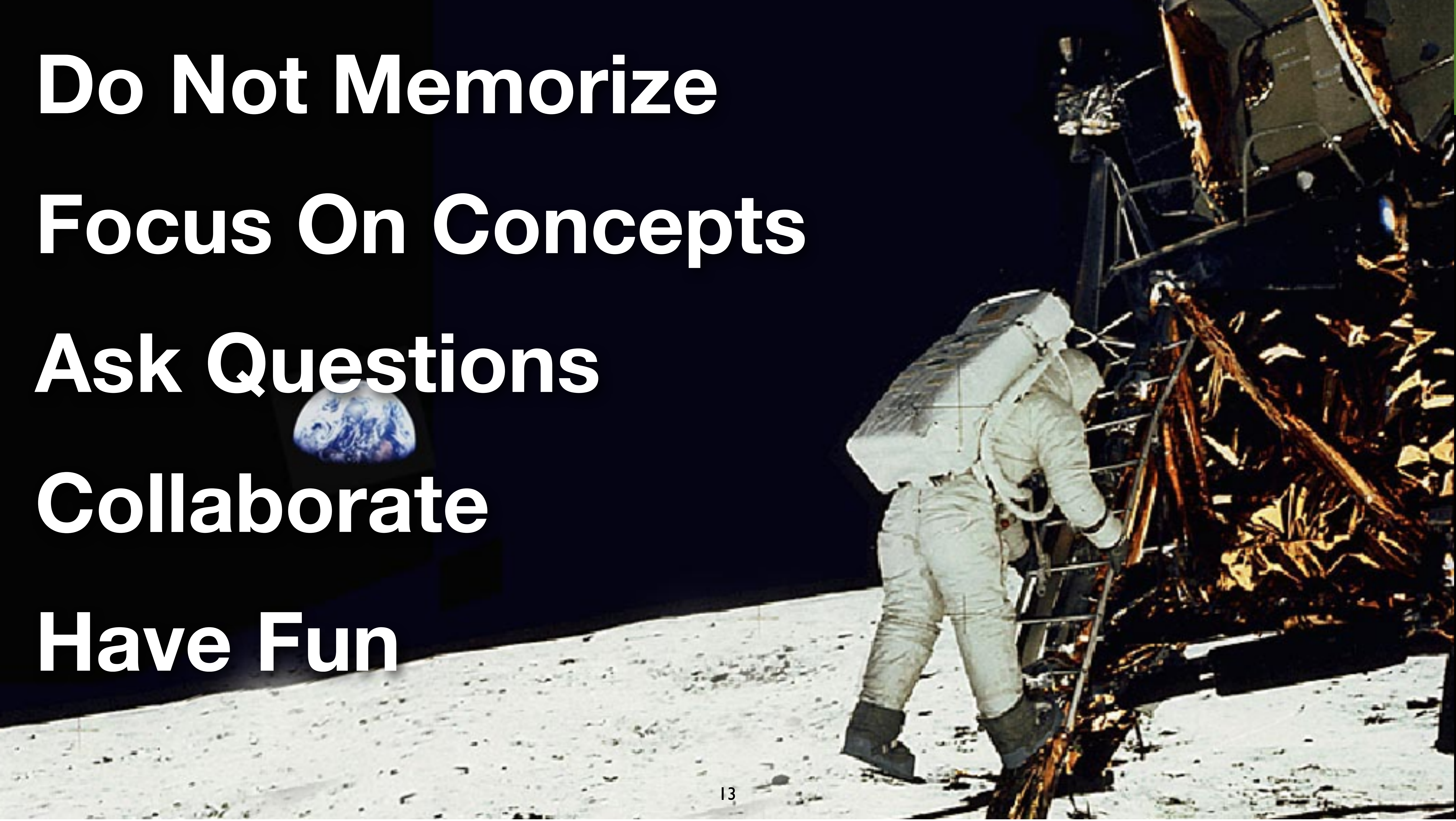
- Class vs. Instance
- Object state
- Method calls
- Class Inheritance

# Books (Optional)




The Pragmatic Programmers
Covers Rails 3
Agile Web Development with Rails
Fourth Edition
Sam Ruby
Dave Thomas
David Heinemeier Hansson
with Leon Breedt, Mike Clark, Justin Gehtland, James Duncan Davidson, and Andreas Schwarz
RAILS
The Facets of Ruby Series


Addison-Wesley Professional Ruby Series
Ruby on Rails 3 Tutorial
Learn Rails by Example
Michael Hartl
Forewords by Derek Sivers and Obie Fernandez



Do Not Memorize

Focus On Concepts

Ask Questions

Collaborate

Have Fun

# Ruby QuickStart

Statements

Methods

Variables

Arrays

Blocks

Hashes

Classes

Instances

# Type-along: Ruby 101

- ➡ Open Terminal
- ➡ irb

# Demo + Lab

Goal: Display a list of Chicago landmarks

Each landmark should have two attributes:

- Name
- Admission Fee

Use an Array of Hash objects.

Use puts statements to display the data.

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Use puts statements to display the data.

# JSON Example

```
"[
  {
    created_at: "2013-01-05T17:41:49Z",
    hometown: "Skokie, IL",
    id: 1,
    name: "Jeff Cohen",
    updated_at: "2013-01-05T17:41:49Z"
  },
  {
    created_at: "2013-01-05T17:41:49Z",
    hometown: "Goshen, IN",
    id: 2,
    name: "Raghu Betina",
    updated_at: "2013-01-05T17:41:49Z"
  }
]"
```

# Converting JSON into a Ruby Hash

```
require 'json'

data = "string"

h = JSON.parse(data)
```

# Automated Testing with Ruby

## class Test::Unit::TestCase

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**Ruby Modules**

- Package Management
- Unit of reusability

# Automated Testing with Ruby

```ruby
class TestJSON < Test::Unit::TestCase

  def test_parse_from_string
    json = '{"favorites": {"color":"maroon", "fruit":"apple", "language":"ruby"}}'
    assert_equal('apple', get_favorite("fruit", json))
  end

end
```

1. Run this code to trigger the test.
2. Watch for success or failure.
3. Write implementation code until success.

# Consuming JSON APIs

What is an API?

JSON notation

Converting JSON into a Ruby hash

# What is an API?

**An Application Programming Interface**

**enables**

**computer-to-computer**

**communication.**

# What is an API?

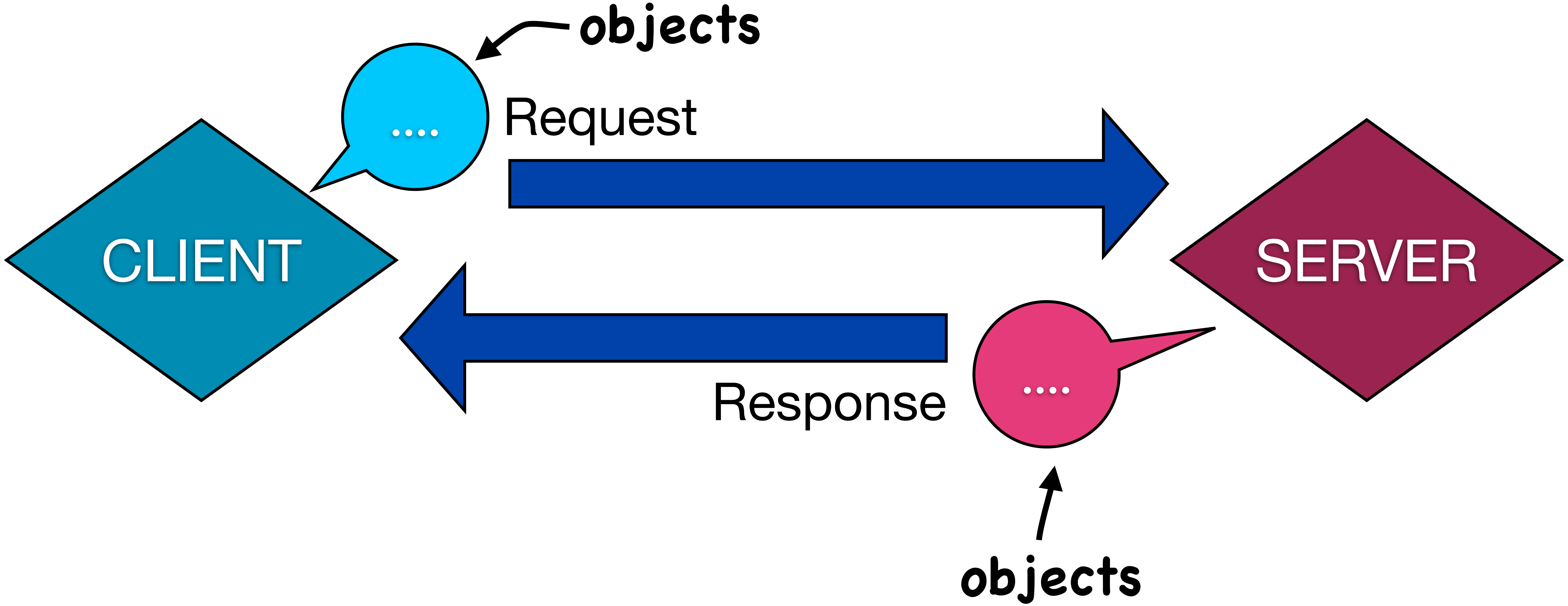
An Application Programming Interface

is an agreement that enables

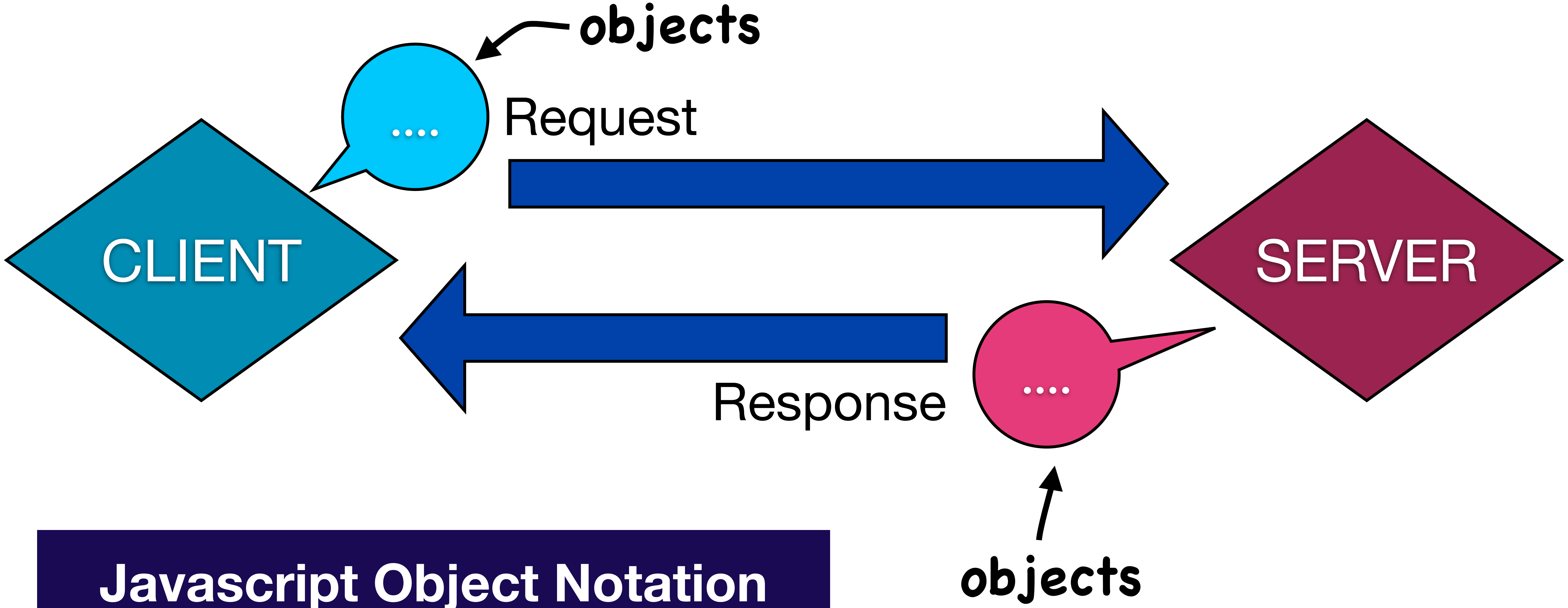
computer-to-computer

communication.

# What is an API?



# JSON APIs



**Javascript Object Notation (JSON)**

# Calling an HTTP API

```
require 'json'
require 'open-uri'

data = open("http:...").read

h = JSON.parse(data)
```

# Challenge: HTTP APIs

- ➡ require 'open-uri'
- ➡ open("http://cspp52553.com/scrabble/hello.json")
- ➡ Try to display the number of scrabble points

# To Do!

★ **Watch for my email**

★ **Setup your Ruby environment**

★ **Homework #1**

# Week 2

- Rails QuickStart
- MVC Architecture
- Development toolkit

# Week 3

- How to receive user input
- URL components: static vs. dynamic
- URL querystring parameters
- Forms
- The params hash

# Week 4

- Relational database structures
- Rails Models, Part 1
- HTTP response formats
- Rails Resources

# Week 5

- Single-Model Queries
- Model Associations
- Migrations Part 2

# Week 6

- Join Model Associations (n-to-n)
- HTTP Cookies and Sessions
- Midterm!

# Week 7

- User Authorization
- Controller Filters
- RubyGems

# Week 8

- Search Functionality
- Pagination
- Mailers
- Javascript and jQuery

- AJAX

# Week 10

- Performance Profiling
- Caching
- Deployment Techniques
- Custom Rake Tasks