Ruby

By: Annika Dame, Jaden Dawdy,
Camilla Eckhardt, Xian Ma

Language Description and History

- The language was created by Yukihiro “Matz” Matsumoto and it blended parts of his favorite languages (Perl, Smalltalk, Eiffel, Ada, and Lisp).

Matx wanted a language that had the following:

- Syntactically Simple
- Truly Object-Oriented
- Has Iterators and Closures
- Exception Handling
- Garbage Collection
- Portable
- In essence he wanted to create a language more powerful than Perl and more object-oriented than Python.

Language Description and History

- The first version of Ruby was released in 1995.
- Ruby allows users to freely alter its parts (parts of Ruby can be removed or redefined by the user) – this makes the language very flexible.
- Utilizes single inheritance – classes can mix in a module and receive all its methods for free which many users see as less restrictive than multiple inheritance.
- The language is object-oriented and gives methods and instance variables to all its types– rules that apply to objects apply to all of Ruby.

Key Features

- Easy to Read Syntax
- Purely Object Oriented
- Dynamic Typing- variables can hold different types of objects during their lifecycle
- Duck Typing - if an object behaves like a certain type, Ruby treats it as that type
- Blocks - unnamed chunks of code that can be accepted as arguments by methods

Installation Instructions

On macOs systems:

- Ruby should be installed by default
- Homebrew can also be used to install Ruby using the command:

```
brew install ruby
```

On Windows systems:

- Go to the Ruby installer page
- Download the latest version that includes DevKit
- Run the installer and follow the instructions that come up on screen

On Linux systems:

```
sudo apt install ruby-full
```

Installation Instructions for Ruby on Rails

Once ruby is installed on your system use the following command:

```
gem install rails
```

To create a new rails web application:

```
rails new myapp
```

To start the server and view your web application:

```
rails server
```

Hello World Program Example

puts ‘Hello World’

Basic Calculator Program Example

```
puts “Enter the first number:”
number1 = gets.chomp.to_f
puts “Enter the second number:”
number2 = gets.chomp.to_f
puts “Enter an operator (+, -, *, /):”
operator = gets.chomp
```

```
Result = case operator
when ‘+’ then number1 + number2
when ‘-’ then number1 - number2
when ‘*’ then number1 * number2
when ‘/’ then number1 / number2
Else “Invalid operator”
end
Puts “The result is #{result}”
```

Random Number Generator Program Example

```
number = rand(1..100)
guess = nil
puts “Guess a number between 1 and 100:”
until guess == number
        guess = gets.chomp.to_i
        puts “Too high!” if guess > number
        puts “Too low!” if guess < number
end

puts “Congratulations! You’ve guessed the number correctly”
```

Related Languages

Ruby vs Java:

- Ruby programs run directly since it's a scripting language, Java is compiled then executed
- Ruby doesn't have any data types, Java does
- Ruby uses dynamic typing, Java uses static typing
- In Ruby the constructor name is always 'initialize', in Java the constructor is the name of the class

Related Languages

Ruby vs Perl:

- Both utilize dynamic typing
- Both are interpreted languages, rather than compiled
- Ruby prefers to have only way to do most things, whereas Perl likes to have multiple. Perl has utilized the saying “There is more than one way to do it” whereas Ruby has utilized the principle of “least surprise”.
- Perl is known for being harder to read whereas Ruby’s syntax is pretty clean and readable
- Perl incorporated some object oriented features later on whereas Ruby is purely object oriented

Links to Sources and Tutorials

About Ruby (ruby-lang.org)

The History of Ruby — SitePoint

Comparing Ruby with other programming languages - GeeksforGeeks