

Ruby Programming

Be a productive Ruby programmer. With this Ruby programming course, you'll discover how Ruby takes care of all the details for you, so you can simply have fun and get more done with less code.

Intended Audience

- Newcomers / bootcamp apprentices who want to learn Ruby for the first time.
- Programmers who want to re-skill into Ruby:

Prerequisites

This is not a beginner to coding course. You **MUST** be at least at the [Intro To Programming](#) level before attempting this course

After this course you should be able to

- Know the fundamentals of Ruby
- Be a more productive programmer in Ruby
- Know the fundamentals of OO for those who have never done OO before

Course Contents

Day 1

Get Ruby

- Use Ruby
- Use Ruby—interactively
- Your first Ruby expressions
- Math operations and comparisons
- Strings

- Variables
- Everything is an object!
- Calling a method on an object
- Let's build a game
- Input, storage, and output
- Running scripts
- Comments
- "puts" and "print"
- Method arguments
- "gets"
- Parentheses are optional on method calls
- String interpolation
- What's in that string?
- Inspecting objects with the "inspect" and "p" methods
- Escape sequences in strings
- Calling "chomp" on the string object
- What methods are available on an object?
- Generating a random number
- Converting to strings
- Ruby makes working with strings easy
- Converting strings to numbers
- Conditionals
- The opposite of "if" is "unless"
- Loops
- Let's try running our game!
- Your Ruby Toolbox

Methods and Classes

- Defining methods
- Calling methods you've defined
- Method names
- Parameters
- Optional parameters
- Return values
- Returning from a method early
- Some messy methods

- Too many arguments
- Too many “if” statements
- Designing a class
- What’s the difference between a class and an object?
- Your first class
- Creating new instances (objects)
- Breaking up our giant methods into classes
- Creating instances of our new animal classes
- Updating our class diagram with instance methods
- Our objects don’t “know” their names or ages!
- Too many arguments (again)
- Local variables live until the method ends
- Instance variables live as long as the instance does
- Encapsulation
- Attribute accessor methods
- Using accessor methods
- Attribute writers and readers
- Attribute writers and readers in action
- Ensuring data is valid with accessors
- Errors—the “emergency stop” button
- Using “raise” in our attribute writer methods
- Our complete Dog class
- Your Ruby Toolbox

Inheritance

- Copy, paste... Such a waste...
- Mike’s code for the virtual test-drive classes
- Inheritance to the rescue!
- Defining a superclass (requires nothing special)
- Defining a subclass (is really easy)
- Adding methods to subclasses
- Subclasses keep inherited methods alongside new ones
- Instance variables belong to the object, not the class!
- Overriding methods
- Bringing our animal classes up to date with inheritance
- Designing the animal class hierarchy

- Code for the Animal class and its subclasses
- Overriding a method in the Animal subclasses
- We need to get at the overridden method!
- The “super” keyword
- A super-powered subclass
- Difficulties displaying Dogs
- The Object class
- Why everything inherits from the Object class
- Overriding the inherited method
- Your Ruby Toolbox

Day 2

Initializing Instances

- Payroll at Chargemore
- An Employee class
- Creating new Employee instances
- A division problem
- Division with Ruby’s Fixnum class
- Division with Ruby’s Float class
- Fixing the salary rounding error in Employee
- Formatting numbers for printing
- Format sequences
- Format sequence types
- Format sequence width
- Format sequence width with floating-point numbers
- Using “format” to fix our pay stubs
- When we forget to set an object’s attributes...
- “nil” stands for nothing
- “/” is a method
- The “initialize” method
- Employee safety with “initialize”
- Arguments to “initialize”
- Using optional parameters with “initialize”
- “initialize” does an end-run around our validation

- “initialize” and validation
- Call other methods on the same instance with “self”
- When “self” is optional
- Implementing hourly employees through inheritance
- Restoring “initialize” methods
- Inheritance and “initialize”
- “super” and “initialize”
- Same class, same attribute values
- An inefficient factory method
- Class methods
- Our complete source code
- Your Ruby Toolbox

Arrays and Blocks

- Arrays
- Accessing arrays
- Arrays are objects, too!
- Looping over the items in an array
- The repeating loop
- Eliminating repetition...the WRONG way...
- Chunks of code?
- Blocks
- Defining a method that takes blocks
- Your first block
- Flow of control between a method and block
- Calling the same method with different blocks
- Calling a block multiple times
- Block parameters
- Using the “yield” keyword
- Block formats
- The “each” method
- The “each” method, step-by-step
- DRYing up our code with “each” and blocks
- Blocks and variable scope
- Using “each” with the “refund” method
- Using “each” with our last method

- Our complete invoicing methods
- We've gotten rid of the repetitive loop code!
- Utilities and appliances, blocks and methods
- Your Ruby Toolbox

Block Return Values

- A big collection of words to search through
- Opening the file
- Safely closing the file
- Safely closing the file, with a block
- Don't forget about variable scope!
- Finding array elements we want, with a block
- The verbose way to find array elements, using "each"
- Introducing a faster method...
- Blocks have a return value
- How the method uses a block return value
- Putting it all together
- A closer look at the block return values
- Eliminating elements we don't want, with a block
- The return values for "reject"
- Breaking a string into an array of words
- Finding the index of an array element
- Making one array that's based on another, the hard way
- Making one array based on another, using "map"
- Some additional logic in the "map" block body
- The finished product
- Your Ruby Toolbox

Day 3

Hashes

- Counting votes
- An array of arrays...is not ideal
- Hashes
- Hashes are objects
- Hashes return "nil" by default

- nil (and only nil) is “falsy”
- Returning something other than “nil” by default
- Normalizing hash keys
- Hashes and “each”
- A mess of method arguments
- Using hashes as method parameters
- Hash parameters in our Candidate class
- Leave off the braces!
- Leave out the arrows!
- Making the entire hash optional
- Typos in hash arguments are dangerous
- Keyword arguments
- Using keyword arguments with our Candidate class
- Required keyword arguments
- Your Ruby Toolbox

References

- Some confusing bugs
- The heap
- References
- When references go wrong
- Aliasing
- Fixing the astronomer’s program
- Quickly identifying objects with “inspect”
- Problems with a hash default object
- We’re actually modifying the hash default object!
- A more detailed look at hash default objects
- Back to the hash of planets and moons
- Our wish list for hash defaults
- Hash default blocks
- Hash default blocks: Assigning to the hash
- Hash default blocks: Block return value
- Hash default blocks: A shortcut
- The astronomer’s hash: Our final code
- Using hash default objects safely
- Hash default object rule #1: Don’t modify the default

object

- Hash default object rule #2: Assign values to the hash
- The rule of thumb for hash defaults
- Your Ruby Toolbox

Mixins

- The media-sharing app
- The media-sharing app...using inheritance
- One of these classes is not (quite) like the others
- Option one: Make Photo a subclass of Clip
- Option two: Copy the methods you want into the Photo class
- Not an option: Multiple inheritance
- Using modules as mixins
- Mixins, behind the scenes
- Creating a mixin for comments
- Using our comments mixin
- A closer look at the revised “comments” method
- Why you shouldn’t add “initialize” to a mixin
- Mixins and method overriding
- Avoid using “initialize” methods in modules
- Using the Boolean “or” operator for assignment
- The conditional assignment operator
- Our complete code
- Your Ruby Toolbox

Day 4

Comparable and Enumerable

- Mixins built into Ruby
- A preview of the Comparable mixin
- Choice (of) beef
- Implementing a greater-than method on the Steak class
- Constants
- We have a lot more methods to define...

- The Comparable mixin
- The spaceship operator
- Implementing the spaceship operator on Steak
- Mixing Comparable into Steak
- How the Comparable methods work
- Our next mixin
- The Enumerable module
- A class to mix Enumerable into
- Mixing Enumerable into our class
- Inside the Enumerable module
- Your Ruby Toolbox

Documentation

- Learning how to learn more
- Ruby's core classes and modules
- Documentation
- HTML documentation
- Listing available classes and modules
- Looking up instance methods
- Instance methods denoted with # in the docs
- Instance method documentation
- Arguments in call signatures
- Blocks in call signatures
- Read the docs for the superclass and mixins, too!
- Read the docs for the superclass and mixins, too!
(continued)
- Looking up class methods
- Class method documentation
- Docs for a class that doesn't exist?!
- The Ruby standard library
- Looking up classes and modules in the standard library
- Where Ruby docs come from: rdoc
- What rdoc can deduce about your classes
- Adding your own documentation, with comments
- The "initialize" instance method appears as the "new"
class method

- Your Ruby Toolbox

Exceptions

- Don't use method return values for error messages
- Using "raise" to report errors
- Using "raise" by itself creates new problems
- Exceptions: When something's gone wrong
- Rescue clauses: A chance to fix the problem
- Ruby's search for a rescue clause
- Using a rescue clause with our SmallOven class
- We need a description of the problem from its source
- Exception messages
- Our code so far...
- Different rescue logic for different exceptions
- Exception classes
- Specifying exception class for a rescue clause
- Multiple rescue clauses in one begin/end block
- Updating our oven code with custom exception classes
- Trying again after an error with "retry"
- Updating our oven code with "retry"
- Things you want to do no matter what
- The ensure clause
- Ensuring the oven gets turned off
- Your Ruby Toolbox

Day 5

Unit Testing

- Automated tests find your bugs before someone else does
- A program we should have had automated tests for
- Types of automated tests
- MiniTest: Ruby's standard unit-testing library
- Running a test
- Testing a class
- A closer look at the test code

- Red, green, refactor
- Tests for ListWithCommas
- Getting the test to pass
- Another bug to fix
- Test failure messages
- A better way to assert that two values are equal
- Some other assertion methods
- Removing duplicated code from your tests
- The “setup” method
- The “teardown” method
- Updating our code to use the “setup” method
- Your Ruby Toolbox

Web Apps

- Writing web apps in Ruby
- Our task list
- Project directory structure
- Browsers, requests, servers, and responses
- Sinatra takes requests
- Downloading and installing libraries with RubyGems
- Installing the Sinatra gem
- A simple Sinatra app
- Your computer is talking to itself
- Request type
- Resource path
- Sinatra routes
- Multiple routes in the same Sinatra app
- A route for the list of movies
- Making a movie list in HTML
- Accessing the HTML from Sinatra
- A class to hold our movie data
- Setting up a Movie object in the Sinatra app
- ERB embedding tags
- The ERB output embedding tag
- Embedding a movie title in our HTML
- Pool Puzzle

- Pool Puzzle Solution
- The regular embedding tag
- Looping over several movie titles in our HTML
- Letting users add data with HTML forms
- Getting an HTML form for adding a movie
- HTML tables
- Cleaning up our form with an HTML table
- There's still more to do
- Your Ruby Toolbox
- **Saving and Loading Data: Keep It Around**
- Saving and retrieving form data
- Our browser can GET the form...
- ... But it needs to POST the response
- Setting the HTML form to send a POST request
- Setting up a Sinatra route for a POST request
- Converting objects to and from strings with YAML
- Saving objects to a file with `YAML::Store`
- Saving movies to a file with `YAML::Store`
- A system for finding Movies in the `YAML::Store`
- Numeric IDs for Movies
- Finding the next available movie ID
- A class to manage our `YAML::Store`
- Using our `MovieStore` class in the Sinatra app
- Testing the `MovieStore`
- Loading all movies from the `MovieStore`
- Loading all movies from the `MovieStore` (continued)
- Loading all movies in the Sinatra app
- Building HTML links to individual movies
- Building HTML links to individual movies (continued)
- Named parameters in Sinatra routes
- Using a named parameter to get a movie's ID
- Defining routes in order of priority
- Finding a `Movie` in the `YAML::Store`
- An ERB template for an individual movie
- Finishing the Sinatra route for individual movies
- Let's try it all out!
- Our complete app code

- Your Ruby Toolbox

Duration and pricing

- *Full-time* over 5 days (R10995)
- *Part-time* over 4 weeks (2 nights per week, 3 hour sessions) (R11995)
- *Part-time* over 8 Saturdays, 3 hour sessions (R11995)
- Please note : For *part-time* courses we do not have a fixed schedule and you will be placed on a waiting list until we get a group of 4+ together. Please book with no dates on the bookings form. This will automatically put you on the waiting list. We will confirm with you as soon as we have a part-time group together.
- [Distance-learning](#) over up to 3 months (R10995)
- International exams are not included in the course price.
- Prices exclude Vat for Vat-registered companies

Certificate

1. Upon completion of this course we will issue you with attendance certificate to certify your attendance and / or completion of the prescribed minimum examples.
2. You may sit for our competency assessment test and on passing you will obtain our competency certificate.
3. Our competency assessment can be booked and taken by someone who has not attended the course at a cost of R2950.

Bookings

You can download the course registration form on our home page or by clicking [here](#)

Brochure

You may download a pdf copy of this page by clicking on the pdf icon at the top of the page.

Questions

Please [email us](#)

Schedule

On the calendar below. If your browser doesn't display the calendar below, please click on [this link](#) or try using [Google Chrome](#), alternatively please enquire via our [Contact Us](#) page