



RUBY ESSENTIAL

Anum

What is Ruby?

- Programming language
- Created in Japan in 1995 by Yukihiro "Matz" Matsumoto
- Syntax like Perl , python and smalltalk.
- Not a compiler language (like C++, Java, VB) . The compiler language is a language where you write a code and you have to run it through computer program or compiler in order to come out with an application that you can actually run at the end.
- It is interpreted language, requires ruby interpreter

Why Ruby?

- It is object oriented.
- Easily readable code
- Unsurprising syntax , naming, behavior. If you want to sort, it will sort, if you want to find, it will find, reverse, it will reverse and so on...
- Whitespace independent.
- No semicolons
- Lots of "syntactic sugar". It allows to write things in simpler way so that we have some short cut to ourselves.

Ruby and Ruby on Rails

| Ruby | Ruby on Rails |
|--|---------------------------------------|
| It is a multipurpose language | It is a web framework written in ruby |
| Not just for web but you can make standalone , noni internet applications. | |

Mac OS – Ruby Installation

- Go to <https://www.ruby-lang.org/> - download for mac -----> 1.9.1
- Mac OS 10.1 : may have problems
- Mac OS 10.2 -10.3: install/upgrade ruby
- Mac OS 10.4: ruby 1.8.2
- Mac OS 10.5 :ruby 1.8.6
- Text Editor: writing code , used plain text, Textmate text editor(macromates.com) is very good to used.
- How to open terminal :
Application -->utilities -->Terminal.app
- On terminal : to check if ruby install type **ruby -v**
- Type : **which ruby** to know where it is located

Windows OS – Ruby Installation

- <https://www.ruby-lang.org/> - download
 - Install ruby interpreter : one click installer (currently v1.8.6)
 - Plain Text editor (notepad ++, sublime, brackets)
 - Command Line : start menu --> all programs --> accessories --> command prompt
-
- **I am using Windows Operating System.**

04. Command Prompt

```
Microsoft Windows [Version 10.0.17134.48]
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C:\Users\anums>ruby -v ✓
ruby 2.3.3p222 (2016-11-21 revision 56859) [x64-mingw32]

C:\Users\anums>ruby -e 'puts 123'
123

C:\Users\anums>ruby -e 'print 123'
123

C:\Users\anums>ls
13D Objects
AppData
```

First program in Ruby

- Go to any text editor like notepad++ or brackets or sublime .
- Type : `puts 123 puts 121` and save it as `first.rb` where `rb` is the extension.
- Open terminal
- Navigate to that folder where you save the file
- Run the file as `ruby first.rb`
- You will see the output

C:/Users/anums/Documents/Ruby_Programs/first.rb (C)

Debug Help

```
1 puts 123
2 puts 121
3
```

```
C:\Users\anums\Documents>cd Ruby_Programs
```

```
C:\Users\anums\Documents\Ruby_Programs>ls
```

```
C:\Users\anums\Documents\Ruby_Programs>ls  
first.rb
```

```
C:\Users\anums\Documents\Ruby_Programs>ruby first.rb
```

```
123
```

```
121
```

```
C:\Users\anums\Documents\Ruby_Programs>
```

How to write comments ?

CODE:

```
puts 123  
# print does not add a line return  
print 564  
puts 121
```

-----**--output**-----

```
C:\Users\anums\Documents\Ruby_Programs>ruby first.rb
```

```
123
```

```
564121
```

Ruby terminal Online – tryruby.org



The screenshot shows the tryruby.org website. The browser address bar displays 'tryruby.org/levels/1/challenges/0'. The page has a hand-drawn style with a kite in the sky and a small animal peeking from behind a tree. The main heading is 'Give Ruby a shot right now!'. Below it, a paragraph describes Ruby as a programming language from Japan, available at ruby-lang.org. It then instructs the user to try Ruby code in the prompt on the right. A list of commands is provided: `help` (starts a 15-minute tutorial), `clear` (clears the screen), and `next` (skips to the next section).

try ruby 

Give Ruby a shot right now!

Ruby is a programming language from Japan (available at ruby-lang.org) which is revolutionizing the web. The beauty of Ruby is found in its balance between simplicity and power.

Try out Ruby code in the prompt on the right. In addition to Ruby's built-in methods, the following commands are available:

- `help` → Starts the 15 minute interactive tutorial. Trust me, it's very basic!
- `clear` → Clears the screen. Useful if your browser starts slowing down. Your command history will be remembered.
- `next` → Allows you to skip to the next section of a

```
Interactive ruby ready.
> puts 123
=> "123"
> print "123"
=> "123"
> puts "sonia"
=> "sonia"
>
```

INTERACTIVE RUBY SHELL

- Allows us to interact with code in real time
- Works like a calculator
- Great for testing code

Command Prompt

Microsoft Windows [Version 10.0.17134.48]
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```
C:\Users\anums>irb ✓
irb(main):001:0> 1 + 1
=> 2
irb(main):002:0> 4 + 6
=> 10
irb(main):003:0> 45 / 8
=> 5
irb(main):004:0> 100 - 4
=> 96
irb(main):005:0> puts "tine"
tine
=> nil ←
irb(main):006:0> puts 323
323
=> nil
irb(main):007:0> puts 2 + 5
7
=> nil
irb(main):008:0> "Hello".reverse ←
=> "olleH"
irb(main):009:0> "Hello".sort
NoMethodError: undefined method `sort' for "Hello":String
    from (irb):9
    from C:/Ruby23-x64/bin/irb.cmd:19:in `<main>'
irb(main):010:0> quit
```

C:\Users\anums>irb --simple-prompt ✓

```
>> 1+2
=> 3
>> puts 3_4
34
=> nil
>> quit
```

C:\Users\anums>

Return
Value

Interactive
Ruby
Shell

Ruby Documentation

- <https://ruby-doc.org/core-2.5.1/> - read the documents here

- Or from terminal :

 Type: ri upcase where ri stands for ruby information

You can see the use of upcase

Then press "q" to quit

Object Types

- Ruby is object oriented programming language.
- An object is the fundamental building block in ruby.

Variables

- They are not objects
- Part of ruby language.
- Allows us to easily reference objects
- Will be undefined or act like an object

Variables

```
Command Prompt - irb

C:\Users\anums>irb
irb(main):001:0> x=3
=> 3
irb(main):002:0> x+5
=> 8
irb(main):003:0> puts x+7
10
=> nil
irb(main):004:0> first_variable = 4
=> 4
irb(main):005:0> article_written=100
=> 100
irb(main):006:0> a=49
=> 49
irb(main):007:0> a
=> 49
irb(main):008:0> totalStudents=45
=> 45
irb(main):009:0> _
```

Variables: scope indicators

| | |
|----------|--------------------------|
| Global | <i>\$</i>variable |
| Class | <i>@@</i>variable |
| Instance | <i>@</i>variable |
| Local | variable |
| Block | variable |

Numbers: Integers

Command Prompt - irb

```
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> 1+1
=> 2
irb(main):002:0> x=3
=> 3
irb(main):003:0> 4/5
=> 0
irb(main):004:0> 4*3
=> 12
irb(main):005:0> 4**3
=> 64
irb(main):006:0> x=4
=> 4
irb(main):007:0> x+=2
=> 6
irb(main):008:0> x
=> 6
irb(main):009:0> x=x+4
=> 10
irb(main):010:0> (1+2)*3
=> 9
irb(main):011:0> 1234.class
=> Fixnum
irb(main):012:0> 7367145345364532645326.class
=> Bignum
irb(main):013:0> -345
=> -345
irb(main):014:0> -467.abs
=> 467
irb(main):015:0> x= 1234* 1234* 1234
=> 1879080904
irb(main):016:0> x.class
=> Bignum
irb(main):017:0> 387.next
=> 388
irb(main):018:0>
```

Integers

Numbers: Decimal/Float

```
Command Prompt - irb
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> 1234.5677
=> 1234.5677
irb(main):002:0> 2334.5667.class
=> Float
irb(main):003:0> x=10
=> 10
irb(main):004:0> y=10.0
=> 10.0
irb(main):005:0> x.class
=> Fixnum
irb(main):006:0> y.class
=> Float
irb(main):007:0> x+1
=> 11
irb(main):008:0> y+1
=> 11.0
irb(main):009:0> x+1.0
=> 11.0
irb(main):010:0> 10.0/3
=> 3.3333333333333335
irb(main):011:0> 10/3.0
=> 3.3333333333333335
irb(main):012:0> 10/3
=> 3
irb(main):013:0> 10/4
=> 2
irb(main):014:0> 12345.6789.round
=> 12346
irb(main):015:0> 12345.6789.to_i
=> 12345
irb(main):016:0> 12345.6789.floor
=> 12345
irb(main):017:0> 12345.6789.ceil
=> 12346
irb(main):018:0> _
```

Float

Strings

```
Command Prompt - irb
C:\Users\anums>irb
irb(main):001:0> "Hello"
=> "Hello"
irb(main):002:0> 'Hello'
=> "Hello"
irb(main):003:0> greeting='Hello'
NameError: undefined local variable or method `greeting' for main:Object
    from (irb):3
    from C:/Ruby23-x64/bin/irb.cmd:19:in `'
irb(main):004:0> greeting='Hello'
=> "Hello"
irb(main):005:0> target='World'
=> "World"
irb(main):006:0> greeting + ' ' + target
=> "Hello World"
irb(main):007:0> "kina"*4
=> "kinakinakinakina"
irb(main):008:0> '7'*4
=> "7777"
irb(main):009:0> 'I\'m escaped.'
=> "I'm escaped."
irb(main):010:0> "I said, \"I'm escapedesd.\""
=> "I said, \"I'm escapedesd.\""
irb(main):011:0> puts "\ta\tb\nc\nd"
      a      b
c
d
=> nil
irb(main):012:0> puts '\ta\tb\nc\nd'
\ta\tb\nc\nd
=> nil
irb(main):013:0> puts "I want to say #{greeting} #{target}."
I want to say Hello World.
=> nil
irb(main):014:0> puts 'I want to say #{greeting} #{target}.'
I want to say #{greeting} #{target}.
=> nil
irb(main):015:0> puts "1+1 = #{1+1}"
1+1 = 2
=> nil
irb(main):016:0> "Hello".capitalize
=> "Hello"
irb(main):017:0> "Hello".downcase
=> "hello"
```

Strings

```
irb(main):018:0> "Hello".upcase  
=> "HELLO"  
irb(main):019:0> "Hello".length  
=> 5  
irb(main):020:0> "Hello".reverse.upcase  
=> "OLLEH"  
irb(main):021:0> "Hello".reverse.upcase.length  
=> 5  
irb(main):022:0> "Hello".reverse  
=> "olleH"  
irb(main):023:0>
```

Steins

Arrays – an ordered collection

```
Command Prompt - irb
C:\Users\anums>irb
irb(main):001:0> data_set = []
=> []
irb(main):002:0> data_set = ["a","s","d"]
=> ["a", "s", "d"]
irb(main):003:0> data_set[1]
=> "s"
irb(main):004:0> data_set[3]
=> nil
irb(main):005:0> data_set
=> ["a", "s", "d"]
irb(main):006:0> data_set << "f"
=> ["a", "s", "d", "f"]
irb(main):007:0> data_set[1] << nil
TypeError: no implicit conversion of nil into String
    from (irb):7
    from C:/Ruby23-x64/bin/irb.cmd:19:in `'
irb(main):008:0> data_set
=> ["a", "s", "d", "f"]
irb(main):009:0> data_set[1] = nil
=> nil
irb(main):010:0> data_set
=> ["a", nil, "d", "f"]
irb(main):011:0> data_set.clear
=> []
irb(main):012:0> data_set
=> []
irb(main):013:0> data_set = []
=> []
irb(main):014:0> data_set = nil
=> nil
irb(main):015:0> data_set.class
=> NilClass
irb(main):016:0> data_set = nil
=> nil
irb(main):017:0> data_set.class
=> NilClass
irb(main):018:0> data_set = []
=> []
irb(main):019:0> data_set.class
=> Array
irb(main):020:0> _
```

Array

Array Method

```
Command Prompt - irb
C:\Users\anums>irb
irb(main):001:0> array = [1,2,3,4,5]
=> [1, 2, 3, 4, 5]
irb(main):002:0> array2=[1,"2",3.0, ["a","b"], "dog"]
=> [1, "2", 3.0, ["a", "b"], "dog"]
irb(main):003:0> array.inspect
=> "[1, 2, 3, 4, 5]"
irb(main):004:0> array
=> [1, 2, 3, 4, 5]
irb(main):005:0> puts array
1
2
3
4
5
=> nil
irb(main):006:0> puts array2.inspect
[1, "2", 3.0, ["a", "b"], "dog"]
=> nil
irb(main):007:0> puts array2
1
2
3.0
a
b
dog
=> nil
irb(main):008:0> array2.to_s
=> "[1, \"2\", 3.0, [\"a\", \"b\"], \"dog\"]"
irb(main):009:0> array2.join(" , ")
=> "1 , 2 , 3.0 , a , b , dog"
irb(main):010:0> x="1,2,3,4,5"
=> "1,2,3,4,5"
irb(main):011:0> x.split(',')
=> ["1", "2", "3", "4", "5"]
irb(main):012:0> y=x.split(',')
=> ["1", "2", "3", "4", "5"]
irb(main):013:0> y
=> ["1", "2", "3", "4", "5"]
irb(main):014:0> y.reverse
=> ["5", "4", "3", "2", "1"]
irb(main):015:0> array
=> [1, 2, 3, 4, 5]
```

Array
Methods

Command Prompt - irb

```
irb(main):016:0> array << 0
=> [1, 2, 3, 4, 5, 0]
irb(main):017:0> array.sort
=> [0, 1, 2, 3, 4, 5]
irb(main):018:0> array2.sort
ArgumentError: comparison of Float with String failed
    from (irb):18:in `sort'
    from (irb):18
    from C:/Ruby23-x64/bin/irb.cmd:19:in `'
irb(main):019:0> array << 3
=> [1, 2, 3, 4, 5, 0, 3]
irb(main):020:0> array.uniq
=> [1, 2, 3, 4, 5, 0]
irb(main):021:0> array.uniq!
=> [1, 2, 3, 4, 5, 0]
irb(main):022:0> array
=> [1, 2, 3, 4, 5, 0]
irb(main):023:0> array.delete_at(2)
=> 3
irb(main):024:0> array
=> [1, 2, 4, 5, 0]
irb(main):025:0> array.delete(4)
=> 4
irb(main):026:0> array
=> [1, 2, 5, 0]
irb(main):027:0> array << 3
=> [1, 2, 5, 0, 3]
irb(main):028:0> array
=> [1, 2, 5, 0, 3]
irb(main):029:0> array.push(4)
=> [1, 2, 5, 0, 3, 4]
irb(main):030:0> array.pop
=> 4
irb(main):031:0> array
=> [1, 2, 5, 0, 3]
irb(main):032:0> array.shift
=> 1
irb(main):033:0> array
=> [2, 5, 0, 3]
irb(main):034:0> array.unshift(1)
=> [1, 2, 5, 0, 3]
irb(main):035:0> array
=> [1, 2, 5, 0, 3]
irb(main):036:0> array + [9,10,11,12]
```

Array Methods

```
[1, 2, 5, 0, 3, 9, 10, 11, 12]  
irb(main):036:0> array + [9,10,11,12] •  
=> [1, 2, 5, 0, 3, 9, 10, 11, 12]  
irb(main):037:0> newarray= array + [9,10,11,12] •  
=> [1, 2, 5, 0, 3, 9, 10, 11, 12]  
irb(main):038:0> newarray •  
=> [1, 2, 5, 0, 3, 9, 10, 11, 12]  
irb(main):039:0> array •  
=> [1, 2, 5, 0, 3]  
irb(main):040:0>
```

Array Method

Hashes — unordered, object-indexed collection of objects or (key-value pairs)

Command Prompt - irb

```
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> person = ['Sonia','Walia','Female','Pink','Long-Hair']
=> ["Sonia", "Walia", "Female", "Pink", "Long-Hair"]
irb(main):002:0> person = { 'first_name' => 'Sonia', 'last_name' => 'Dutta' }
=> {"first_name"=>"Sonia", "last_name"=>"Dutta"}
irb(main):003:0> person['first_name']
=> "Sonia"
irb(main):004:0> person['last_name']
=> "Dutta"
irb(main):005:0> person.index('Dutta')
(irb):5: warning: Hash#index is deprecated; use Hash#key
=> "last_name"
irb(main):006:0> mixed = {1 => ['a','s','f','t'], 'hello' => 'world', [10,20] => 'top' }
=> {1=>["a", "s", "f", "t"], "hello"=>"world", [10, 20]=>"top"}
irb(main):007:0> mixed
=> {1=>["a", "s", "f", "t"], "hello"=>"world", [10, 20]=>"top"}
irb(main):008:0> mixed[1]
=> ["a", "s", "f", "t"]
irb(main):009:0> mixed[[10,20]]
=> "top"
irb(main):010:0> mixed.keys
=> [1, "hello", [10, 20]]
irb(main):011:0> mixed.values
=> [["a", "s", "f", "t"], "world", "top"]
irb(main):012:0> mixed.size
=> 3
irb(main):013:0> mixed.to_a
=> [[1, ["a", "s", "f", "t"]], ["hello", "world"], [[10, 20], "top"]]
irb(main):014:0> mixed.clear
=> {}
irb(main):015:0> mixed = {}
=> {}
irb(main):016:0> mixed = {1 => ['a','s','f','t'], 'hello' => 'world', [10,20] => 'top' }
mixed.clear
=> {}
irb(main):017:0> person
=> {"first_name"=>"Sonia", "last_name"=>"Dutta"}
irb(main):018:0> person['gender'] = 'male'
=> "male"
irb(main):019:0> person
=> {"first_name"=>"Sonia", "last_name"=>"Dutta", "gender"=>"male"}
irb(main):020:0>
```

Hashes

```
mixed = {1 => ['a','s','f','t'], 'hello' => 'world', [10,
```

When to use array / hashes

- Use arrays when the order matters
- Use hashes when label is matter

Symbols- is a label used to identify a piece of data AND only stored in memory one time

Command Prompt - irb

```
C:\Users\anums>
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> :test
=> :test
irb(main):002:0> :this_test
=> :this_test
irb(main):003:0> "test".object_id
=> 26402900
irb(main):004:0> :test.object_id
=> 354588
irb(main):005:0> "test".object_id
=> 28073940
irb(main):006:0> :test.object_id
=> 354588
irb(main):007:0> hash = {:first_name => 'Kamal', :last_name => 'Preet'}
=> {:first_name=>"Kamal", :last_name=>"Preet"}
irb(main):008:0> hash['first_name']
=> nil
irb(main):009:0> hash[:first_name]
=> "Kamal"
irb(main):010:0> _
```

same id

Symbols

Boolean(true/false)- comparison and logic operators

| | |
|---------------------------------|-------------------|
| Equal | == |
| Less than | < |
| Greater than | > |
| Less than or equal to | <= |
| Greater than or equal to | >= |
| Not | ! |
| Not equal | != |
| AND | && |
| OR | |

❏ Select Command Prompt - irb

```
C:\Users\anums>
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> x=1
=> 1
irb(main):002:0> x ==1
=> true
irb(main):003:0> true.class
=> TrueClass
irb(main):004:0> false.class
=> FalseClass
irb(main):005:0> x !=1
=> false
irb(main):006:0> x < 3
=> true
irb(main):007:0> x>3
=> false
irb(main):008:0> !x
=> false
irb(main):009:0> !y
NameError: undefined local variable or method `y' for main:Object
    from (irb):9
    from C:/Ruby23-x64/bin/irb.cmd:19:in `
```

Boolean

Boolean

```
=> false
irb(main):019:0> z=nil
=> nil
irb(main):020:0> z.nil?
=> true
irb(main):021:0> 2.between?(1,4)
=> true
irb(main):022:0> 2.between?(3,4)
=> false
irb(main):023:0> [1,2,3].empty?
=> false
irb(main):024:0> [].empty?
=> true
irb(main):025:0> [1,2,3].include?(2)
=> true
irb(main):026:0> [1,2,3].include?(5)
=> false
irb(main):027:0> {'a' => 1, 'b' => 2}.has_key?('a')
=> true
irb(main):028:0> {'a' => 1, 'b' => 2}.has_key?(':a')
=> false
irb(main):029:0> {'a' => 1, 'b' => 2}.has_value?(2)
=> true
irb(main):030:0> _
```

Ranges

- Inclusive range = 1...5 so it includes 1,2,3,4,5
- exclusive range = 1...5 so it includes 2,3,4

Command Prompt - irb

```
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> 1..10
=> 1..10
irb(main):002:0> x= 1..10
=> 1..10
irb(main):003:0> x.class
=> Range
irb(main):004:0> 1..10.class
ArgumentError: bad value for range
    from (irb):4
    from C:/Ruby23-x64/bin/irb.cmd:19:in `'
irb(main):005:0> (1..10).class
=> Range
irb(main):006:0> x.begin
=> 1
irb(main):007:0> x.end
=> 10
irb(main):008:0> x.first
=> 1
irb(main):009:0> x.last
=> 10
irb(main):010:0> y=1..10
=> 1..10
irb(main):011:0> y.begin
=> 1
irb(main):012:0> y.end
=> 10
irb(main):013:0> x.include?(1)
=> true
irb(main):014:0> y.include?(1)
=> true
irb(main):015:0> y.include?(10)
=> true
irb(main):016:0> z= [*x]
=> [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
irb(main):017:0> x
=> 1..10
irb(main):018:0> z
=> [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
irb(main):019:0> 'a'..'m'
=> "a".."m"
irb(main):020:0> alpha = 'a'..'m'
=> "a".."m"
```

Ranges

1..10
'a'.....'p'

Ranges

```
irb(main):016:0> z = [*x]
=> [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
irb(main):017:0> x
=> 1..10
irb(main):018:0> z
=> [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
irb(main):019:0> 'a'..'m'
=> "a".."m"
irb(main):020:0> alpha = 'a'..'m'
=> "a".."m"
irb(main):021:0> alpha.include?('g')
=> true
irb(main):022:0> [*alpha]
=> ["a", "b", "c", "d", "e", "f", "g", "h", "i", "j", "k", "l", "m"]
irb(main):023:0> alpha.include?('p')
=> false
irb(main):024:0> _
```

Constants:

- not true objects
- points to object.
- The constant are constant
- Different from variables
- Declare constant in capital letter , not in small letters
- TEST=10

Command Prompt - irb

```
C:\Users\anums>
C:\Users\anums>
C:\Users\anums>irb
irb(main):001:0> test=1
=> 1
irb(main):002:0> TEST=2
=> 2
irb(main):003:0> test
=> 1
irb(main):004:0> TEST
=> 2
irb(main):005:0> Hello = 10
=> 10
irb(main):006:0> test =100
=> 100
irb(main):007:0> TEST=100
(irb):7: warning: already initialized constant TEST
(irb):2: warning: previous definition of TEST was here
=> 100
irb(main):008:0> TEST
=> 100
irb(main):009:0> Hello =20
(irb):9: warning: already initialized constant Hello
(irb):5: warning: previous definition of Hello was here
=> 20
irb(main):010:0> Hello
=> 20
irb(main):011:0> _
```

Constants