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 complier language is a language whre 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 , non 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(micromates.com) is very good to used.
- How to open terminal :

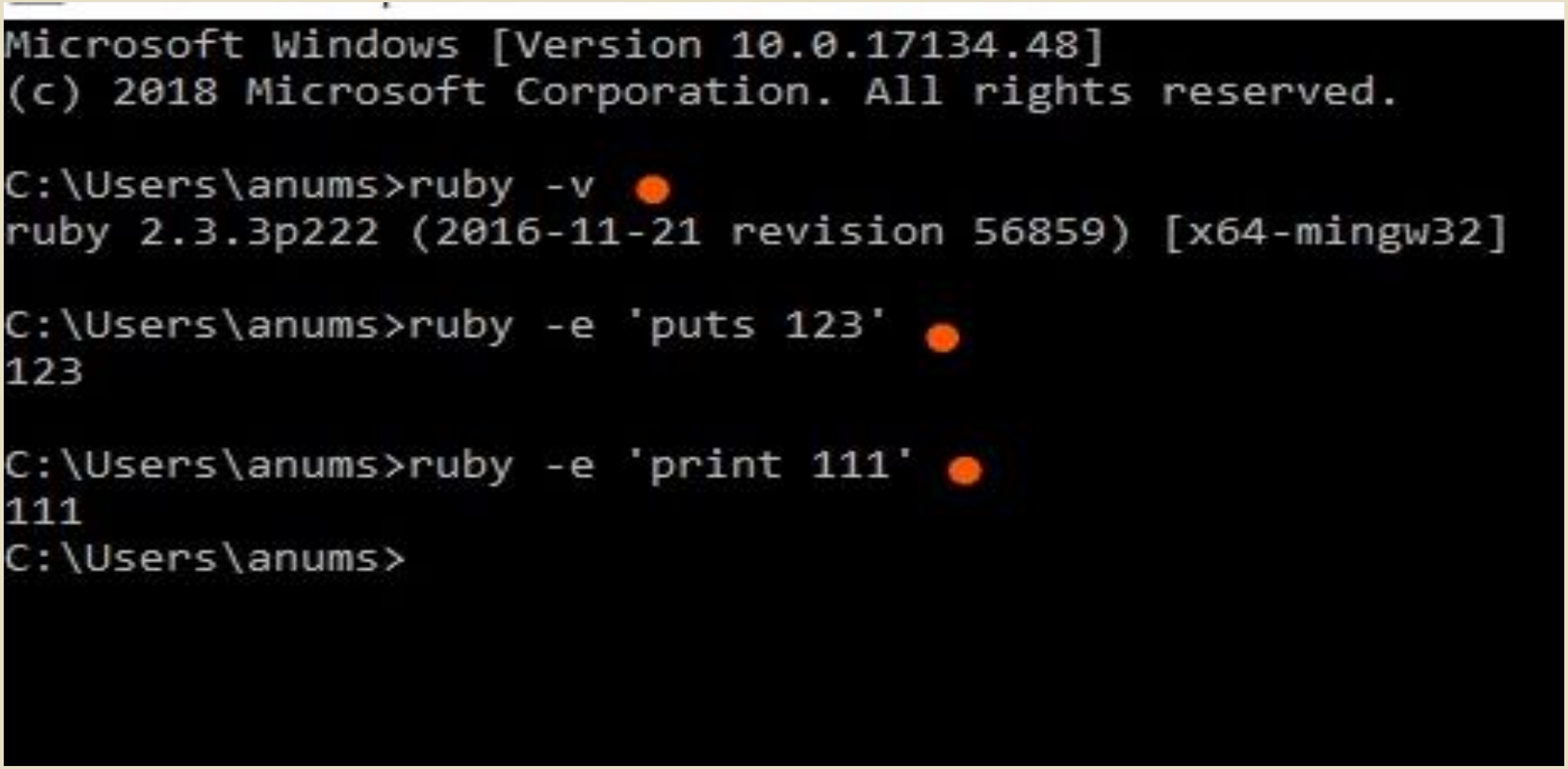
  Application -->utilities -->Terminal.app
- On terminal : to check if ruby install type **ruby –v**
- Type : **which ruby** to know where it is located

Windows OS – Ruby Installation

- https://www.riuby-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.**

Go to terminal and check if Ruby is installed or not



First program in Ruby

- Go to any text editor like notepad++ or brackets or sublime .(I am using brackets)
- 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 or you can also type like this: Ruby first.rb (small r or capital R)
- You will see the output :

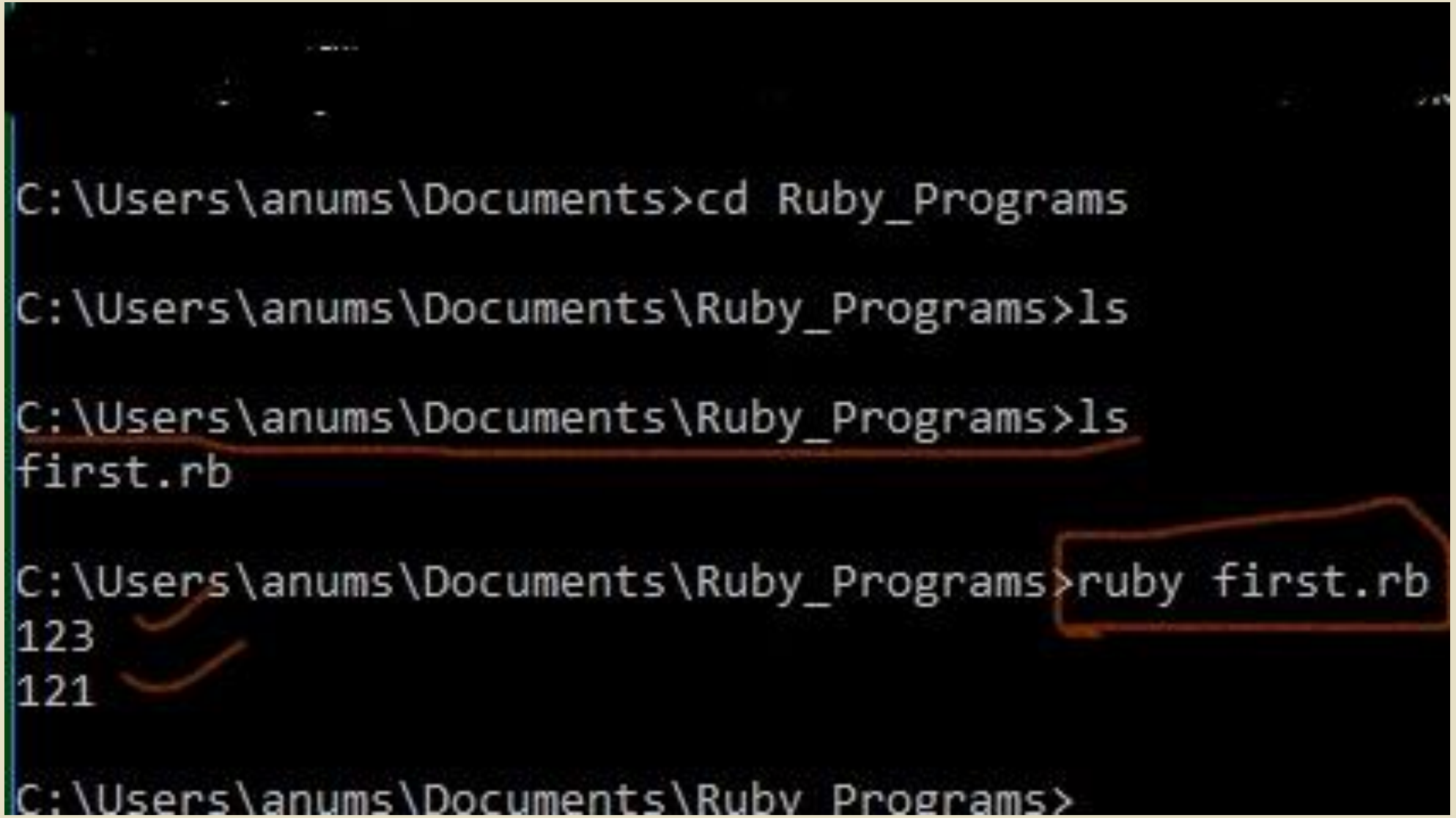
123

121

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

Debug Help

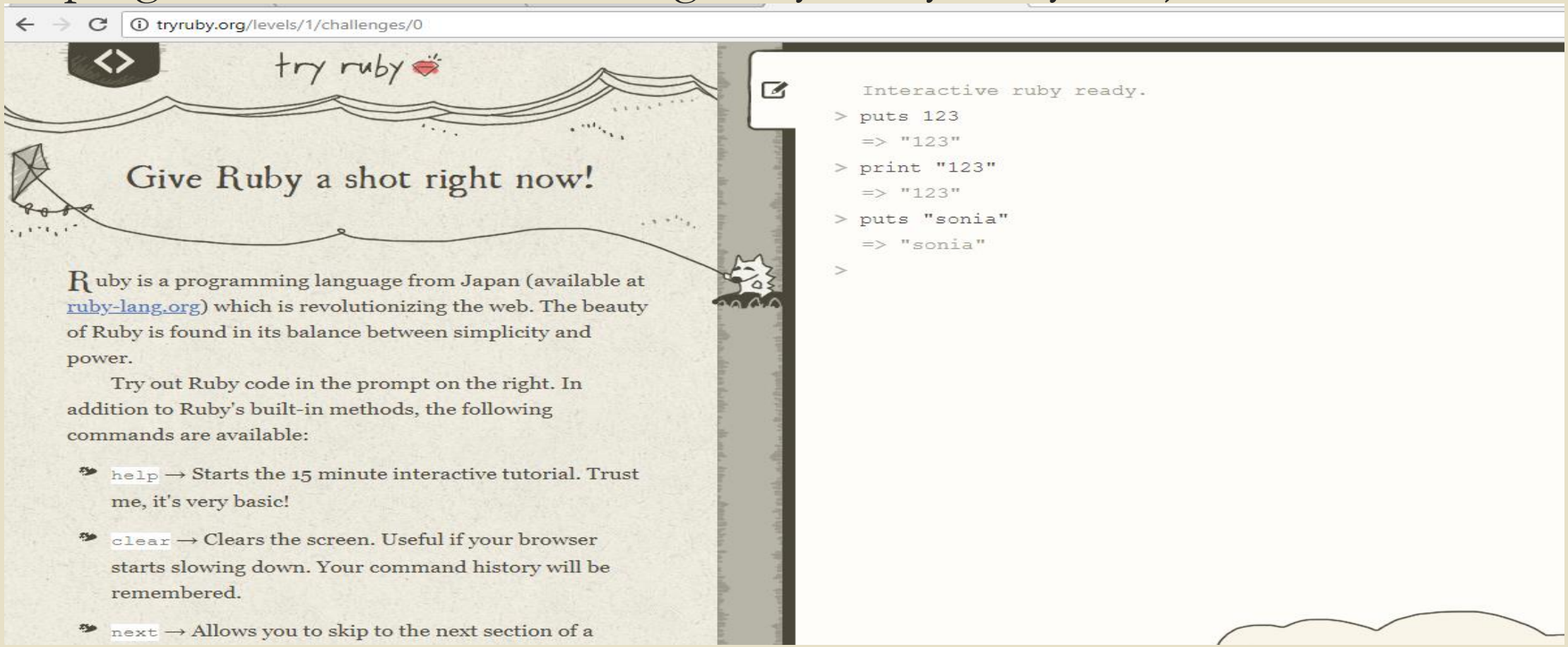
```
1   puts 123
2   puts 121
3
```


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 ?

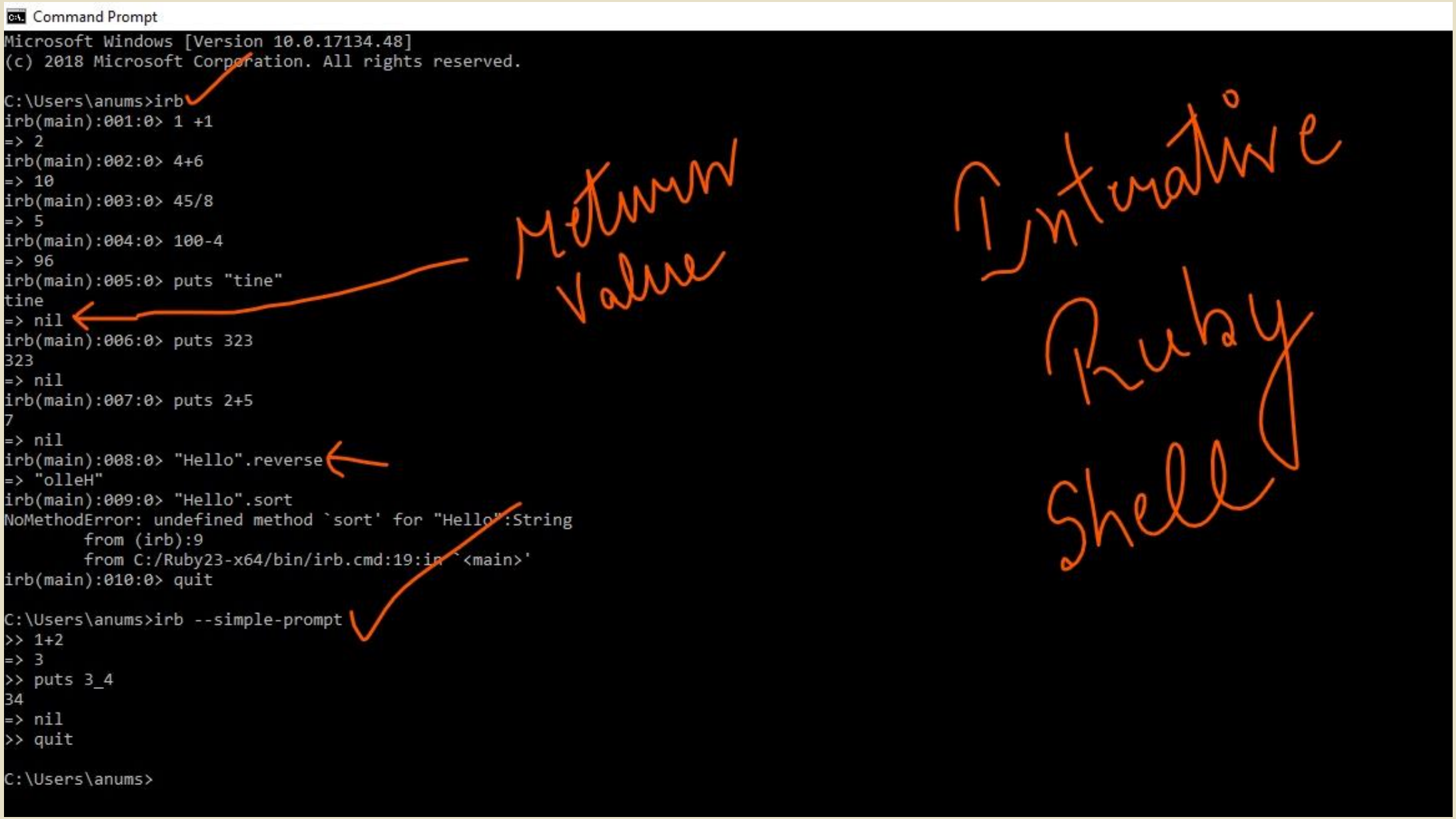
```ruby
# single line comment  (using hash sign)

puts 500
# print doesnot return a line return
print 300
puts 388

=begin

for mult-line comments use equal to begin and equal to end

.....
....
...
=end

puts "Hello"
puts "World"
```

Ruby terminal Online – **tryruby.org** (if you want to execute ruby programs online than installing Ruby into your system)



INTERACTIVE RUBY SHELL

- Allows us to interact with code in real time
- Works like a calculator
- Great for testing code
- Type **irb** (Interactive Ruby) in terminal and starts executing your code.


Command Prompt
Microsoft Windows [Version 10.0.17134.48]
(c) 2018 Microsoft Corporation. All rights reserved.
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
Intuitive 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

Object Types

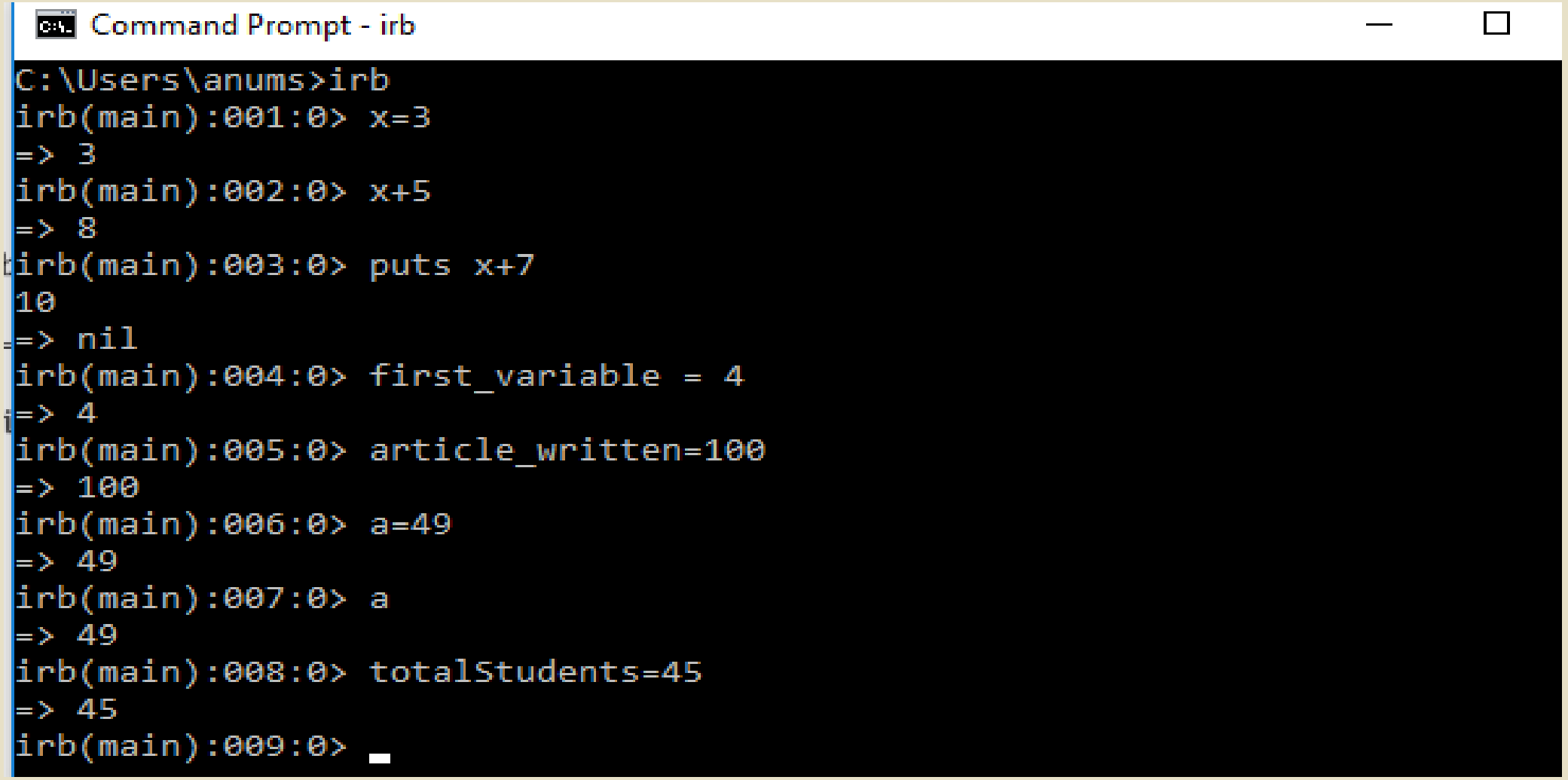
- Ruby is object oriented programming language.
- An object is the fundamental building block in ruby.

- ❑Variables
- ❑Float
- ❑Strings
- ❑Array
- ❑Hashes
- ❑Symbols
- ❑Boolean
- ❑Ranges
- ❑Constant

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	$variable
Class	@@variable
Instance	@variable
Local	variable
Block	variable

Numbers: Integers

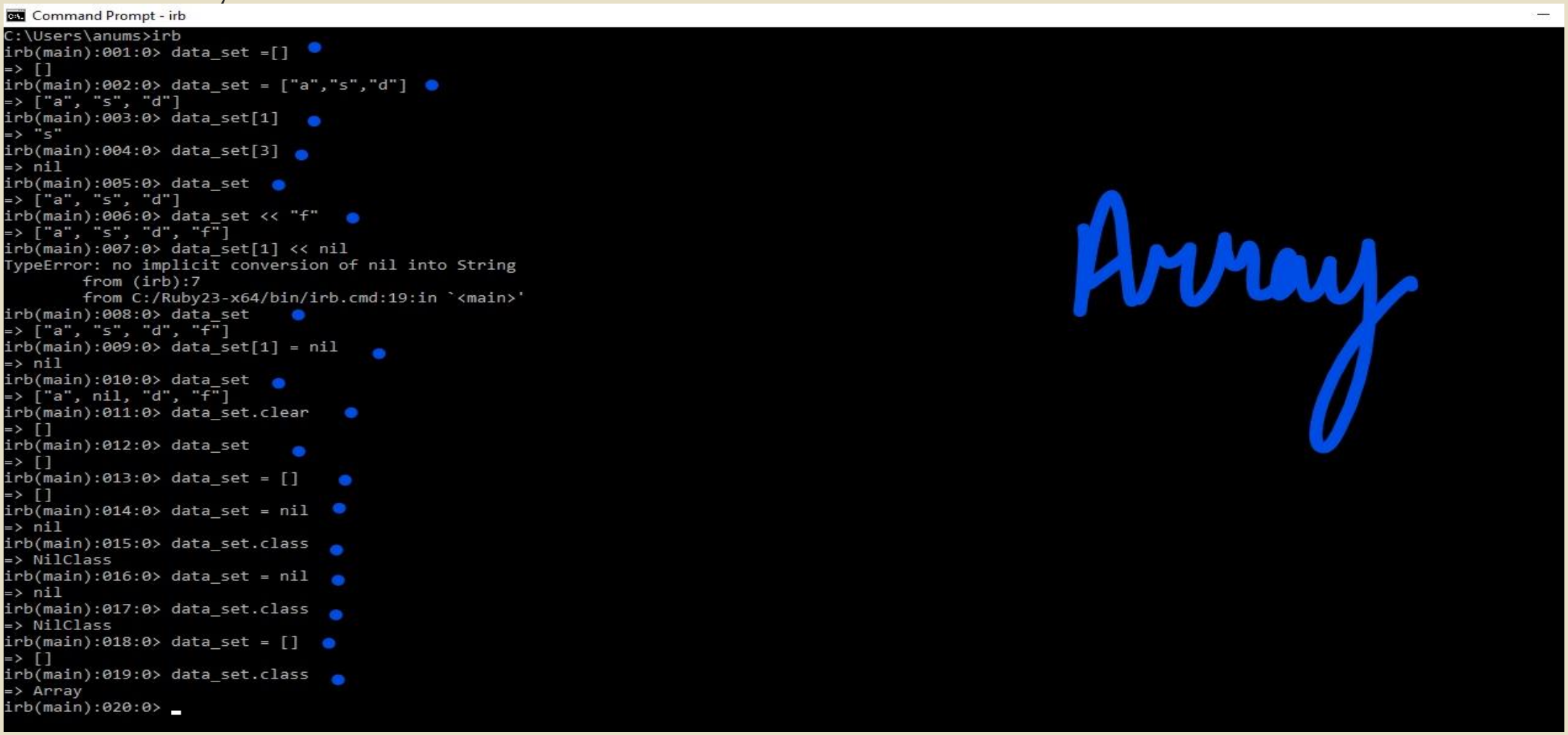
Numbers: Float

Strings

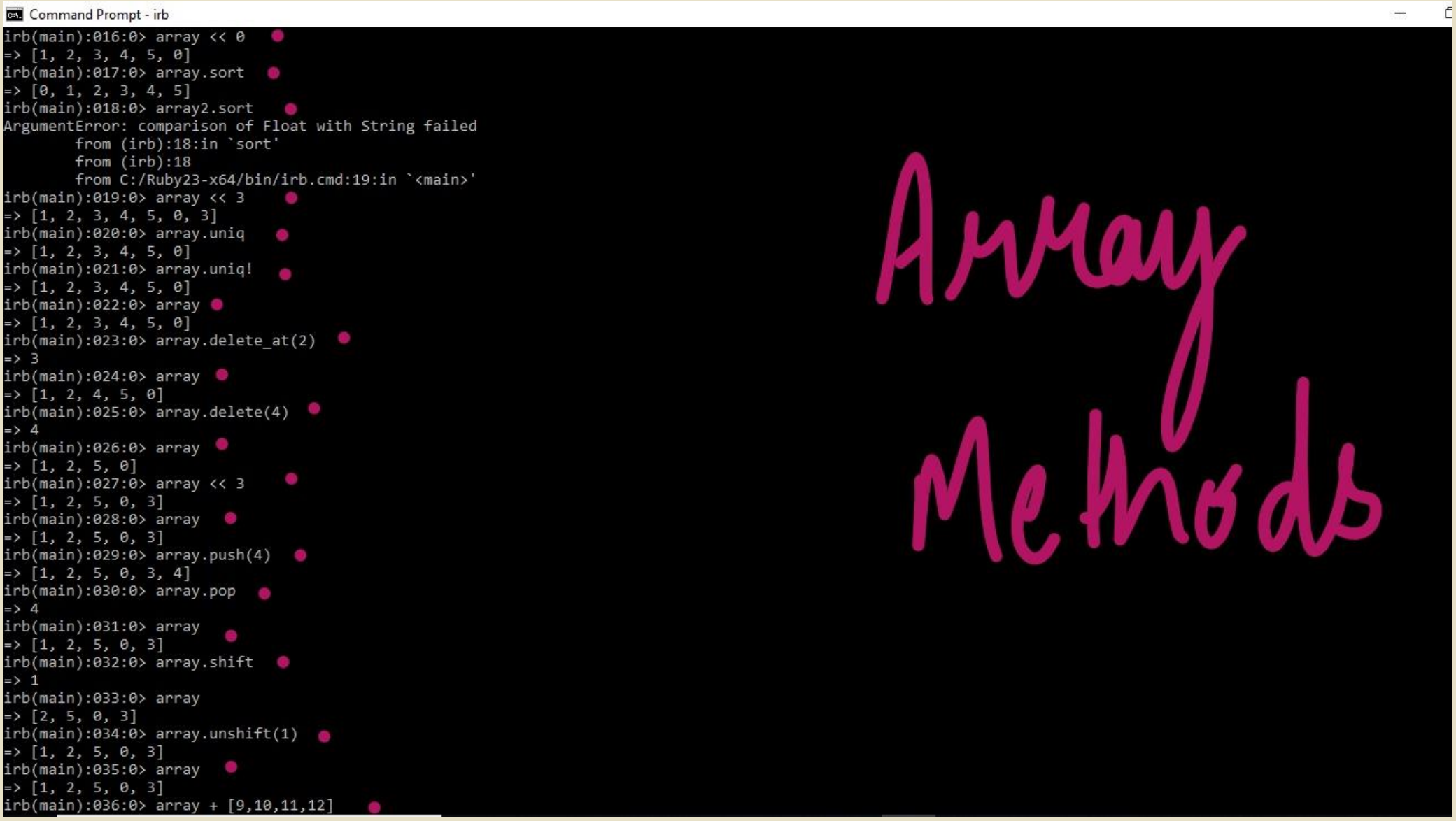

Command Prompt - irb
C:\Users\anums>irb
irb(main):001:0> "Hello"
=> "Hello"
irb(main):002:0> 'Hello'
=> "Hello"
irb(main):003:0> greeting-'Hello'
NameError: undefined local variable or method `greeting' for main:Object
from (irb):3
from C:/Ruby23-x64/bin/irb.cmd:19:in `<main>'
irb(main):004:0> greeting='Hello'
=> "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 escapsed.\""
=> "I said, \"I'm escapsed.\""
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

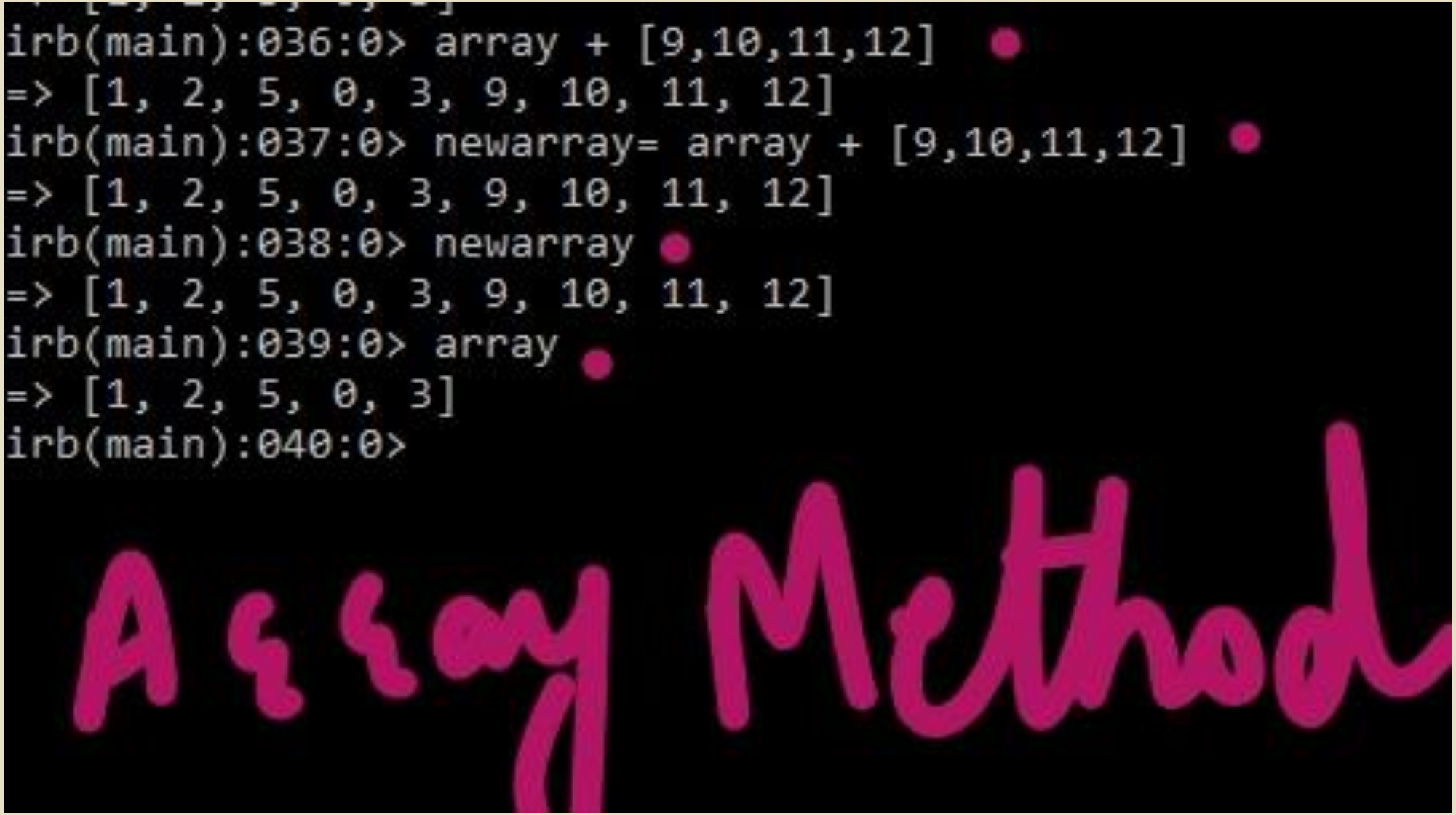

irb(main):018:0> "Hello".upcase
=> "HELLO"
irb(main):019:0> "Hello".length
=> 5
irb(main):020:0> "Hello".reverse.upcase
=> "OLLEH"
irb(main):021:0> "Hello".reverse.upcase.length
=> 5
irb(main):022:0> "Hello".reverse
=> "olleH"
irb(main):023:0>
Strings

Arrays – an ordered collection



Array Method


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 `<main>'
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

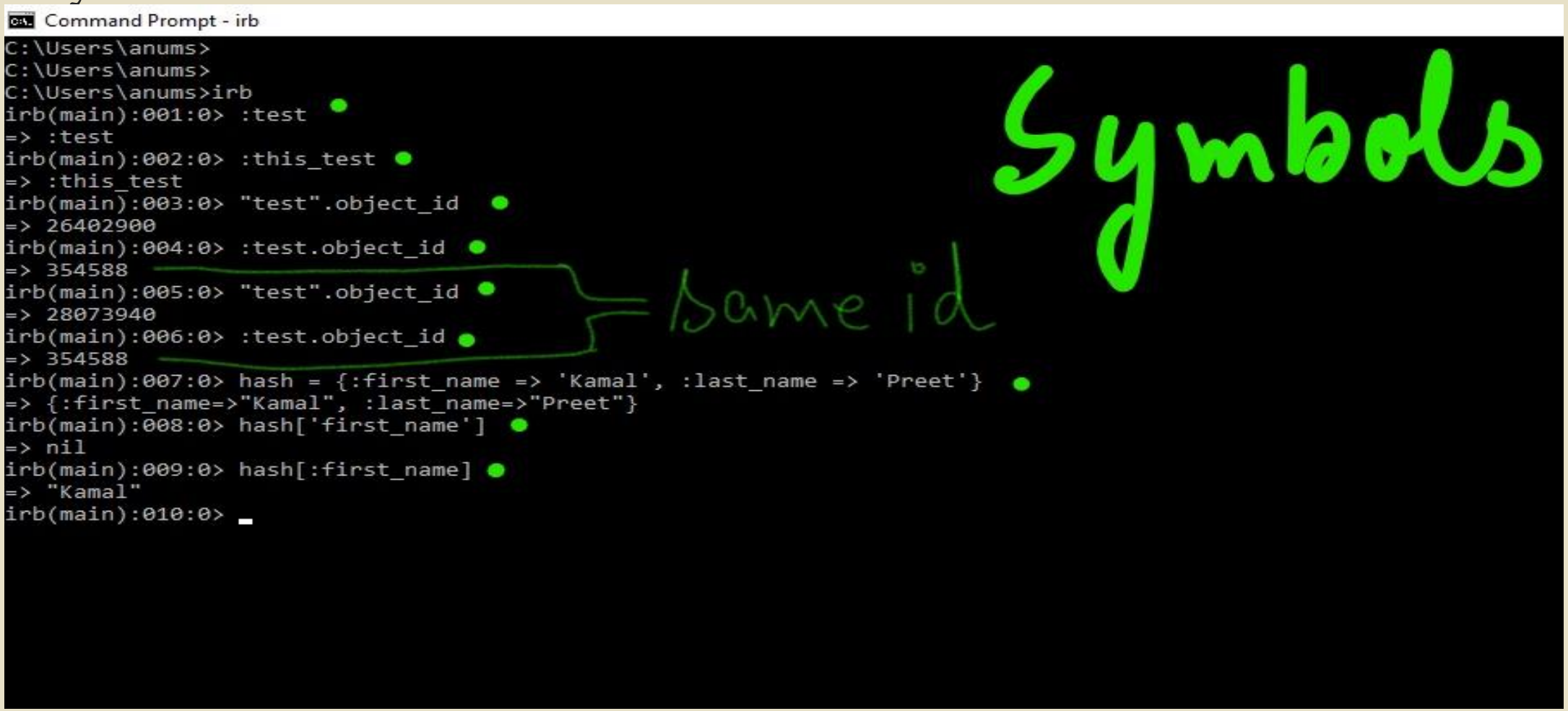

irb(main):036:0> array + [9,10,11,12]
=> [1, 2, 5, 0, 3, 9, 10, 11, 12]
irb(main):037:0> newarray= array + [9,10,11,12]
=> [1, 2, 5, 0, 3, 9, 10, 11, 12]
irb(main):038:0> newarray
=> [1, 2, 5, 0, 3, 9, 10, 11, 12]
irb(main):039:0> array
=> [1, 2, 5, 0, 3]
irb(main):040:0>
Array Method

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

When to use array / hashes

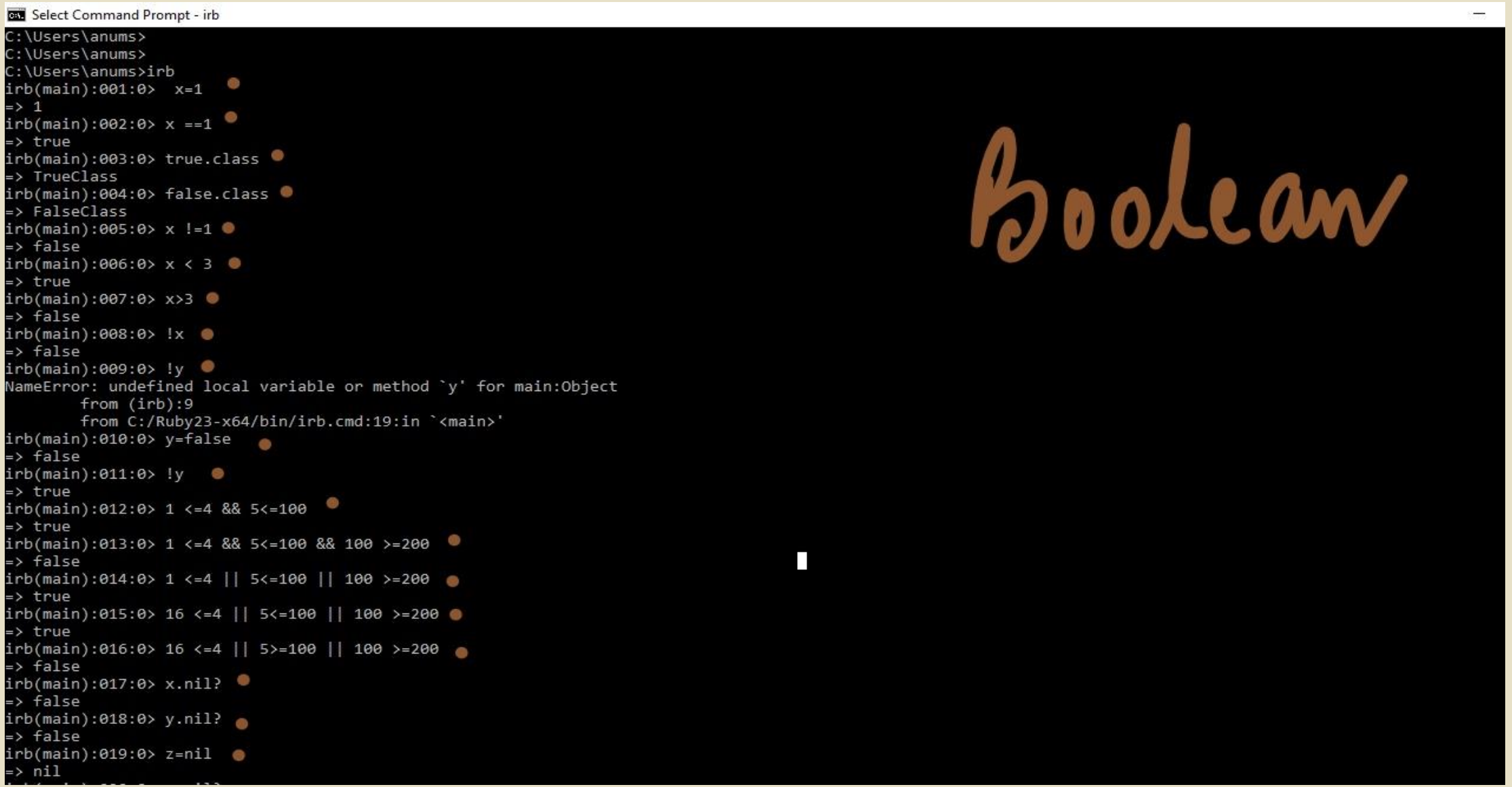
- Use arrays when the order matters
- Use hashes when label is matter

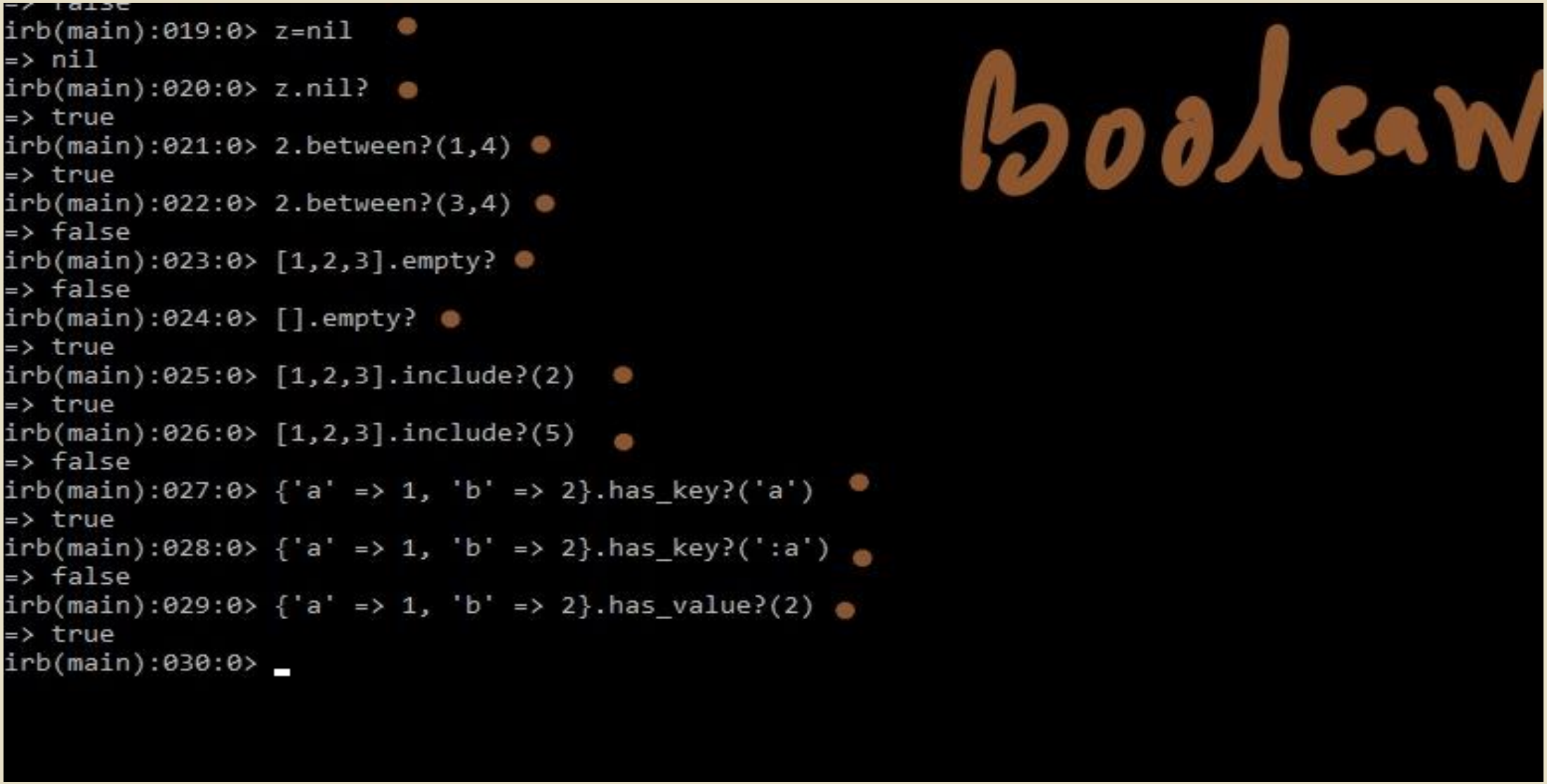
Symbols- is a label used to identify a piece of data AND only stored in memory one time



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 `<main>'
irb(main):010:0> y=false
=> false
irb(main):011:0> !y
=> true
irb(main):012:0> 1 <=4 && 5<=100
=> true
irb(main):013:0> 1 <=4 && 5<=100 && 100 >=200
=> false
irb(main):014:0> 1 <=4 || 5<=100 || 100 >=200
=> true
irb(main):015:0> 16 <=4 || 5<=100 || 100 >=200
=> true
irb(main):016:0> 16 <=4 || 5>=100 || 100 >=200
=> false
irb(main):017:0> x.nil?
=> false
irb(main):018:0> y.nil?
=> false
irb(main):019:0> z=nil
=> nil
Boolean


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>
Boolean

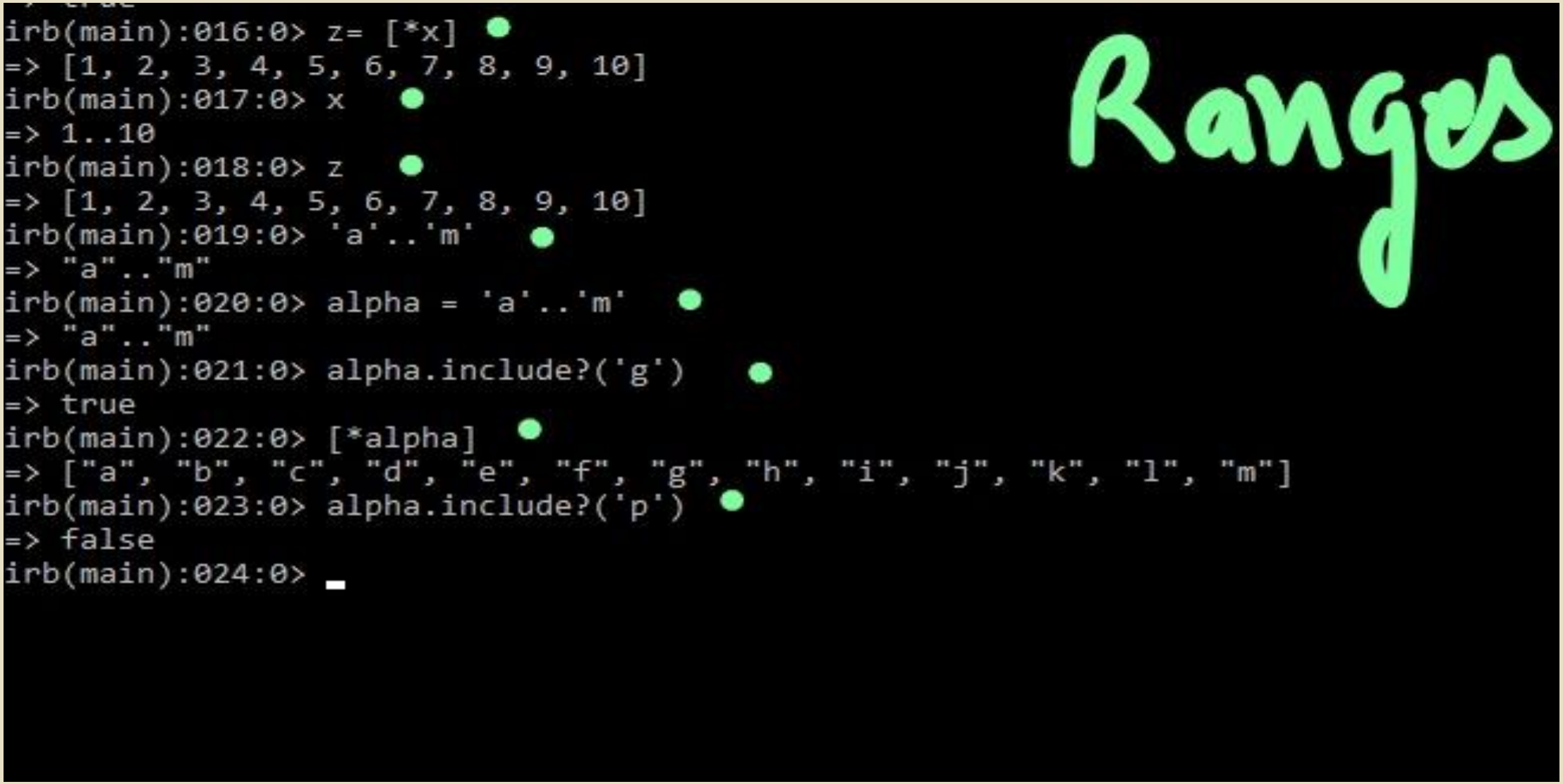
Ranges

- 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 `<main>'
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


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

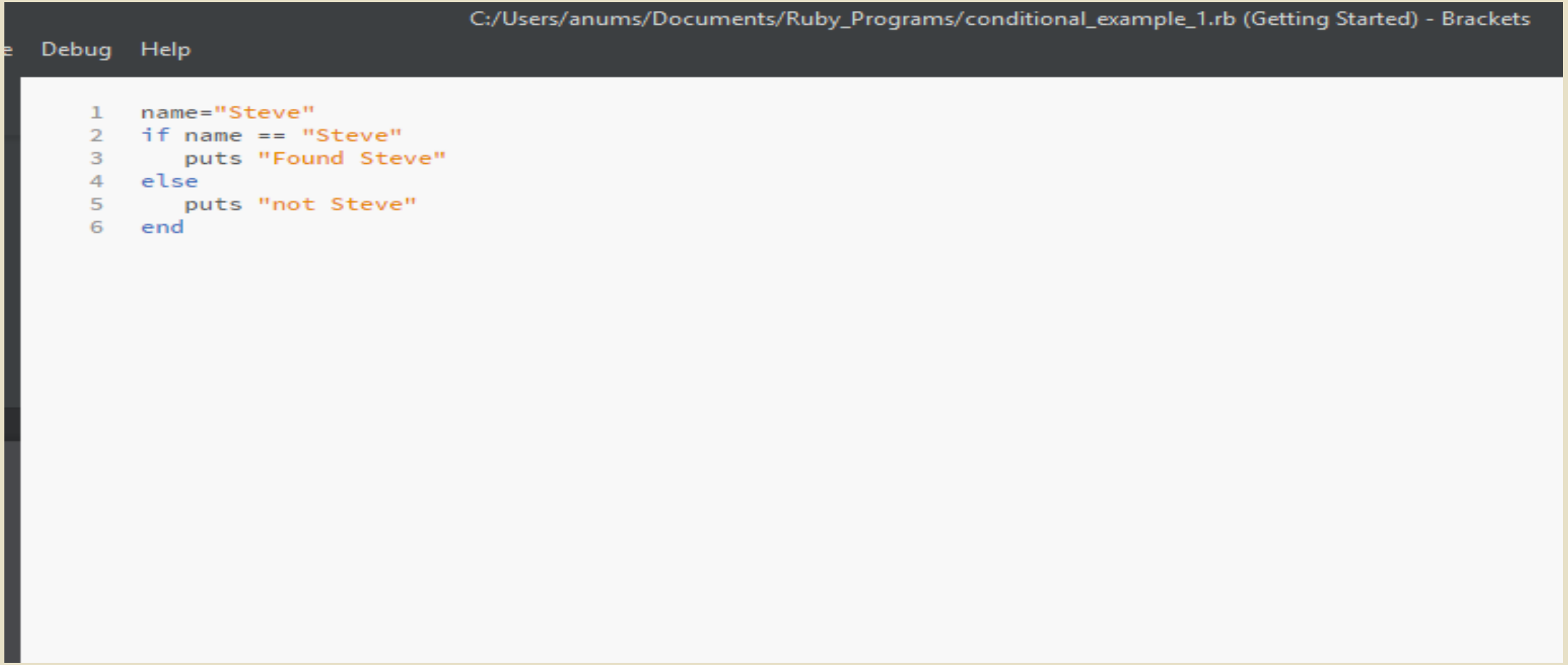
Control Statements

Conditionals

- Provide the action in Ruby programming

- ❑if , elsif and else
- ❑unless
- ❑case
- ❑ternary
- ❑or/or-equals

if and else statement example



if elsif and else example

C:/Users/anums/Documents/Ruby_Programs/conditional_example_2.rb (Getting Started) - Brackets

ebug Help

```ruby
# example of conditional statements
#x=56 first execution
x=17  # seconf execution
if x<=10
  puts "less than and equal to 10"
elsif x >=20
  puts "greater than and equal to 20"
else
puts "numbers are between 11 and 19"
end

```

unless

```
1   =begin
2   syntax for unless:
3
4   unless boolean
5   ...
6   end
7
8   =end
9   x = 1
10  unless x == 2
11    puts "x is not 2"
12  end
```

case

```
=begin
syntax for unless:

case test_value
when value
..
when value
..
else
..
end

=end

x=1
case
when x == 0
  puts "x is 0"
when x == 1
  puts "x is 1"
when x == 2
  puts "x is 2"
else
  puts "x is not 0, 1, or 2"
end
```

Ternary Operator

```
1   =begin
2   ternary operator:syntax
3
4   boolean ? code1 : code2
5
6   =end
7
8   x=1
9   puts x==1? "one" : "not one"
```

or/or equals

```
1   =begin
2   or/or-equals operator:syntax
3
4   unless x
5   x=y
6   end
7   is same as
8   x || = y
9   it means if x has a value then leave it alone
10  but if not , then we will set x=y
11  =end
12
13  x=1
14  y= nil
15  z=2
16
17  puts "example1"
18  x=y || z
19  puts "the value of x is #{x}"
20  puts "the value of y is #{y}"
21  puts "the value of z is #{z}"
22
23  puts "example2"
24  x ||= y
25  puts "the value of x is #{x}"
26  puts "the value of y is #{y}"
27
28
```

Output:

```
C:\Users\anums\Documents\Ruby_Programs>ruby conditional_example_1.rb
Found Steve

C:\Users\anums\Documents\Ruby_Programs>ruby conditional_example_2.rb
numbers are between 11 and 19

C:\Users\anums\Documents\Ruby_Programs>ruby unless_example.rb
x is not 2

C:\Users\anums\Documents\Ruby_Programs>ruby case_example.rb
x is 1

C:\Users\anums\Documents\Ruby_Programs>ruby ternary_example.rb
one

C:\Users\anums\Documents\Ruby_Programs>ruby or-equal-example.rb
example1
the value of x is 2
the value of y is
the value of z is 2
example2
the value of x is 2
the value of y is

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

Loops

- Loop do : just like for loop
- Break : terminate the whole loop
- Next: jump to next loop
- Redo: redo this loop
- Retry: start the whole loop over
- While: while condition is true, loop over
- Until : if not

break

```ruby
x=0
loop do      # like for loop
  x += 2     # increment by 2
  break if x >= 20      # terminate from loop if x>=20
  puts x     # print the values of x
end
```

next

```
1   x=0
2   loop do
3     x += 2
4     break if x >= 20
5     next if x == 6
6     puts x
7   end
```

while

```
1   x = 0
2   while x < 20
3     x += 2
4     puts x
5   end
```

output

```
C:\Users\anums\Documents\Ruby_Programs>ruby break_example.rb
2
4
6
8
10
12
14
16
18

C:\Users\anums\Documents\Ruby_Programs>ruby next_example.rb
2
4
8
10
12
14
16
18

C:\Users\anums\Documents\Ruby_Programs>ruby while_example.rb
2
4
6
8
10
12
14
16
18
20
```

Iterators

- 1.upto(5) {puts "Hello"}
- 5.downto(1) { puts "Hello"}
- (1..5).each { puts "Hello" }

```ruby
1.upto(5) do |num|
  puts "Hello " + num.to_s
end
```

```ruby
fruits = ['banana', 'apple', 'pear']
# => ["banana", "apple", "pear"]
fruits.each do |fruit|
  puts fruit.capitalize
end

# another syntax
for fruit in fruits
  puts fruit.capitalize
end
```

```
20

C:\Users\anums\Documents\Ruby_Programs>ruby iterator_example1.rb
Hello 1
Hello 2
Hello 3
Hello 4
Hello 5

C:\Users\anums\Documents\Ruby_Programs>ruby iterator_example2.rb
Banana
Apple
Pear
Banana
Apple
Pear

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