Phase 1 Quick References

Ruby, Git and GitHub, Rspec, Regular expressions, Markdown, SQL. This is what you need for phase 1. Updates, feel free to reach out to any of the **SF-Dragonflies-2015**

Got an update, correction, let me know:
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Ruby

Everything is an Object, even basic datatypes. methods of an object are called using dot syntax. Every method returns an object. Therefore methods and method-results can be chained.

```
25.methods.sort
```

Numbers

```
1.even?
1.odd?
to_s        to_sym      to_f        round       between     chr
div         next        pred        even        ceil        chr         divmod
```

Operators

```
+   -   *   /   =   ==    !=    >   <   >=    <=    [] **
.     ::
```

70's style user input

```
name = gets.chomp             #read user input and remove the \n
```

Arrays

```
ar=[]                         #empty array
ar = Array.new(8){Array.new(8)}     #use block to init multi-dimensional arrays

words = ["foo", "bar", "baz"]
numbers = [1,2,3,4,5]
words[i]                      #return ith element
words[-5]                     #return 5th from end
words[0..1]                   #return array with first two items
```

```
.first
.last

words <<  'woot'              #append new element , push
words + sentences             #concatenate arrays
words.concat(sentences)       #same but modifies words
```

Useful methods:

```
.size
.length                       #number of elements

.pop                          #pops off last element, deleting it
.push(item)                   #pushes at end
.shift                        #returns first element, modifies array

.delete(obj)                  #delete every element that matches.  Note that 2
.delete(obj){"rtn this if not found"} #obj's can have different IDs but same contents

.delete_if{|obj| obj.size < 4 } #delete obj based on property, i.e. obj.size < 4

.join (delim)                 #into string, ["hello", "there"].join(' ')
.include? (element)           #does the array contain element
.index(element)               #index of where the element is stored
.insert(idx, obj, obj2…)      #insert obj before element idx

.map { |el| el + 1 }           #rtn array w/ 1 added to each element
```

Iteration: do something on each element of the array. It looks like this:

```
my_ar.each { |element| puts element }
```

or

```
my_ar.each do |element|       #side effects only.(puts element)
  puts element                #the array is returned not changed.
                              #but can assign in loop:
end                           #new_ar << element + 5 within do

.each_with_index {|element, index | puts element + index }
                              #access to element and its index.
.any?( {|element| condition})
.all?( {|element| condition})
.none?( {|element| condition})#return appropriate boolean
.select {|num| num % 2 == 0}  #keeps only even
.select do |number| … end     #alt format

.delete_if {|num| num % 2 == 0}     #keeps only odd
.flatten                      #multi-dim array to linear array
```

```
.sort                       #return an new sorted array
.sort!                      #modify the original array
```

Splat

the splat operator turns arrays into a parameter list, and a param list into an array.

```
def divide(numerator, denominator)
  numerator / denominator
end

divide(*[4,2])                    #array into params

values = [5, 6, 7, 8]
def min_max(*values)              #params into array
  [values.min, values.max]
end

min, max = min_max(3,5,2)         #min # => 2,max # => 5

first, *rest = [1, 2, 3]          #using splat to slurp
first       # => 1
rest        # => [2, 3]


triples = [[1, 2, 3], [4, 5, 6], [7, 8, 9]]    #array to params in block
triples.each { |(first, second, third)| puts second } #note multiple parameters

triples.map { |(first, *rest)| rest.join(' ') } # => ["2 3", "5 6", "8 9"]
```

Strings

```
str = "str variable"
'' and " "                    # single quote doesn't allow string interpolation inside
puts "this is a #{str}"       #=> this is a string variable
puts 'this is a #{str}'       #=> this is a #{str}
text = %q{This is a test      #create multi line string
of multi-line text}

“The var is: #{variable}.”    #print string and value

'Red' << ‘Ruby'               #=> "RedRuby" String append (shovel operator)
'Red' + ‘Ruby'                #=> "RedRuby" String append (+ operator)

.each_char
.each_line
.length
.index ’c’                    #return the index of first ‘c’
.starts_with?(string)
.end_with?(string)
```

```
.split(’ ‘)                    #split into an array at each ‘ ‘
.to_f                          #convert to float
.to_i                          #convert to integer
.next                          #inc as int or string, stays a string

.sub('I', 'We')
.gsub('I', 'We')
.gsub(/[aeiou]/,'ff')          #sub ‘ff’ for each & every vowel

.match(/ ./,4)                 #match “ .”  at pos 4 or after


65.chr                         #returns the ascii char for a number
'c'.getbyte(0)                 #returns the letter for a 1 byte ascii
```

Logical Operators

```
||    &&    !
```

Hash: Key/Value pairs.

```
kid_ages = { "Jack" => 10,"Jill" => 12}          #string key, rocket form
kid_ages["Jack"] = 11

kid_ages = {:Jack  => 10, :Jill => 12}           #symbol key
kid_ages[√] = 11

kid_ages = {Jack: 10, Jill: 12}                  #short cut form
kid_ages[:Jack] = 11

a = [:punch, 0]                                  #alternative defining of a Hash
b = [:kick, 72]
key_value_pairs = [a,b];
chuck_norris = Hash[key_value_pairs]

kid_ages = Hash.new("brown")                     #default value for missing keys
kid_ages.keys                                    #retrieving keys

.keys
.values
.clear
.delete(key)                                     #deletes the k,v pair, returns v
.delete_if { |k, v| v < 12 }                     #delete any for which block rtns true
.has_value?(v)
.has_key?(k)
```

```ruby
.each { |k, v| puts "#{k} and #{v}" }

.delete_if {|k, v| k == 4 && v <=11}
.select {|k, v| k == 4 && v <=11}


hash = {:a => 1, :b => 2, :c => 3}              #hash values to variables
a, b = hash.values_at(:a, :b)
```

Conditionals

```ruby
if condition
  stmt
  elsif condition
    stmt
    else
       stmt
    end
 end
 stmt
end

unless can be used instead of if

cond ? stmt1 : stmt2              #ternary: if cond then do stmt1 else to stmt2

expr if condition                 #used for 1 line conditional
expr unless condition

case my_var
  when 5
    stmt
  when (6..10)
    stmt
  else
    stmt
  end

case                              #without a variable, when can be full conditional
  when x < 25 & y > 18
    stmt
  when condition
    stmt
  else
    comp
  end
```

Loops

```
loop do

   break [conditiona]
end


while condition

   next if condition                    #skip to the next loop iteration
end


statement while condition


until condition
…
end


loop do
  break if condition
end

5.times do |i|
end

5.downto(1) do |i|
end

for element in array do
end

for element in (a..b) do
end

array.each do |element|
end


array.each_with_index do |element, index|
end

hash.each {|key,value| puts key + value }

string.each_char do |c|
end

(3..6).each do |el|
end
```

```ruby
for i in (0..5) do

1.upto(5)1) do |number|

Sometimes frowned upon:

$i = 0
$num = 5
begin
   puts("Inside the loop i = #$i" )
   $i +=1
end while $i < $num
```

Classes

```ruby
class Rectangle
  attr_accessor :var1, :var2, :var3

  def initialize(length, breadth)
    @length = length
    @breadth = breadth
  end

  def perimeter
    2 * (@length + @breadth)
  end
end
```

Over-riding a Method

```ruby
class MyClass

  def initialize
    @code = ['A', 'B', 'C', 'D']
  end

  def [](i)
    @code[i]
  end
end

mine = MyClass.new
puts mine[3]
```

Blocks & Procs

A proc is just a block you give a name so you could call it from more than one place.
Create like this: `my_p = Proc.new {|a, b| a + b}`

Call it like this: `my_p.call(a, b)`

```
#Whenever you pass a Proc to a method you have to do it as you would a variable, within
the method's( )s.  #You pass block outside the ().

def calculation(a, b, my_p)         #define a method that takes a proc
      my_p.call(a, b)
end


addition = lambda {|a,b| a+b }      #lambdas are like proc but also check number of args
puts calculation(5,4,addition)
```

With the addition of the & you can pass a raw block outside when you call the method:

```
def takes_a_block(a, b, &operation)
  operation.call(a, b)
end

puts takes_a_block(7,4){|a,b| a + b}

#In this case to pass a lambda or proc you must have a & in the call to turn it back into
a block
puts takes_a_block(5, 14, &my_p)

def takes_a_block(a, b, &my_p)      #Using yeild you call the block
  yield(a, b)
en
puts takes_a_block(1,4){|a,b| a + b}

or implicit:

def calculation(a, b)               #don't use this, it sucks you can't see the block
  yield(a, b)
end

puts calculation(-1,-4){|a,b| a + b}
--
```

Files

```
string = File.read("movie-times.txt")
array = File.readlines("movie-times.txt")

f = File.new("todos")
f.each {|line| puts "#{f.lineno}: #{line}" }

File.open("cool-things.txt", "w") do |f|  #will create if file doesn't exist
  f.puts "Race cars"
  f.puts "Lasers"
end

f.close

$stdin.each do |input|              #line is basic unit
  puts "I was given: #{ input }"

if __FILE__ == $PROGRAM_NAME              #if run directly from bash (not pry) do this
stuff
```

ARGV

```
$ ruby my_cat_counter.rb list_of_cats.txt
if !ARGV.length==0
puts ARGV[0]
```

Exceptions

```ruby
class BadCommand < StandardError
end


  puts "hi there"

  loop do
    begin
      input = ask_user
      break
    rescue BadCommand => e
      puts e.message
      puts "Try again: "
      #puts e.backtrace.inspect
    end
  end

end

def ask_user
  puts "enter a command: "
  command = gets.chomp
  raise BadCommand.new "Not a valid command" \
      unless ["jump", "roll-over", "sit"].include?(command)
  command
end
```

Regular Expressions

Regular expressions match patterns in strings. For example, the * character is often used as a "wild card" character that matches one or more of any character, so `*apple` matches both `apple` and `crabapple.` if you use UNIX you'll know that

```
ls *.rb
```

will list all of the ruby files in the directory, those whose name ends in ".`rb`". Regexes can be useful to match legal forms of phone numbers or email addresses and not invalid ones, or to substitute a replacement string for a matched one (using `string.gsub`).

Regular expressions are virtually unreadable, mind-numbing, tedious but powerful. `A regex command string is` usually placed between slash characters: / and /

In Ruby regexes are used with the methods `string.match` and `string.gsub.`
Each code from the summary below can be used to match one or more characters in a string. To include a special character like '{' or '(' in a string (e.g. a phone number) use a backslash before the special character to "escape" it.

Encosing a regex pattern in (..) will capture the string it matches which can then be used in the replacement string of a gsub call. Each (…) group can be referenced by number, for example '\1' is the first such group. See the example below.

rubular.com is a website for testing regexes.

EXAMPLES:

```
/[aeiou]/               match any single vowel
/\d/                    match any single digit
/\d{3}                  match any string of three digits
/\d{3}.?                match any 3 digits followed by zero or one other char
\d{3}\)?.\d{3}.?\d{4}   match any three digits, a possible ')', then three digits,
                              and then 4 digits with possible separators.
/\A[+-]?\d+\Z/          match only integers
```

Here's an example that removes parenthesis and other chars from a phone number. The phone digits are captured in (…) and used as '\1' . Easier to use Ruby's string.select, no?

```
string = "(415) 297-3277"
puts string.gsub(/\(?(\d{3})\)?.?(\d{3}).?(\d{4})\)?/, '\1''\2''\3')

#=> 4152973277
```

Regular Expression Matchers

```
[abc]    A single character of: a, b, or c
[^abc]   Any single character except: a, b, or c
[a-z]    Any single character in the range a-z
[a-zA-Z] Any single character in the range a-z or A-Z
^        Start of line
$        End of line
\A       Start of string
\z       End of string
.        Any single character
\s       Any whitespace character
\S       Any non-whitespace character
\d       Any digit
\D       Any non-digit
\w       Any word character (letter, number, underscore)
\W       Any non-word character
\b       Any word boundary
(...)    Capture everything enclosed, see groups in
(a|b)    a or b
a?       Zero or one of a
a*       Zero or more of a
a+       One or more of a
a{3}     Exactly 3 of a
a{3,}    3 or more of a
a{3,6}   Between 3 and 6 of a
\        putting a \ before a special char like ) or } means treat is as just a char
```

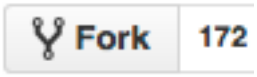
Git and GitHub

Where is my Phase-N Guide?

- https://github.com/sf-bumblebees-2015 #make this a bookmark
- search for "guide" if you don't immediately see your phase guide

How do I: Fork a repository from DevBootCamp to my own github account?

- Fork will copy and break the connection to the parent repository. You can't git push to the parent.
- Go to GitHub.com and login to your account.
- Go to the GitHub repository page you want.
- If you see the following graphic, it's a repository you can fork. Click it.

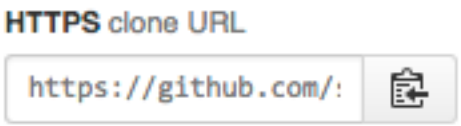


clone a repository from DevBootCamp to your own computer

It will ask you where to fork it, and you can click on your GitHub picture.

How do I clone a DBC repository to my Mac?

Go to the repository you want (see above)
Look for this:



If you don't see this, you are not on a repository page. Click the little clipboard icon to copy that URL. Make sure it says "https" since this is a protected directory.

Go to your computer and navigate in terminal to a folder (e.g. ~/DevBootCamp) where you want the cloned directory to be placed. I had folders for each phase and each week inside the folder DevBootCamp. Then from the terminal type git clone and paste in the URL you just copied above:

```
git clone https://github.com/sf-bumblebees-2015/phase-1-guide.git
```

OK, I've cloned to my machine. How do I make a branch?

Make sure you in the repository's main directory. If you are not sure do an

```
ls -la
```

and you should see the `.git` directory.

```
drwxr-xr-x@ 14 mikefarr  staff   476B Jun  4 22:08 .git
```

Now, if you are on your own computer:

```
git checkout -b mybranchname master
```

If you are at DBC:

```
weare git-hub-name
```

or if pairing:

```
weare git-hub-name,other-git-hub-name
pair-branch
```

This will do the checkout -b for you. Do this whenever you clone a repository and need to make your own branch. When you leave be sure to do a

```
weare out
```

to log out of the DBC computer.

OK, how do I push my own branch to DBC?

Make sure you are not on the master branch. Make sure you have committed all files. A common mistake is that you forgot to add modified or new files. Do a:

```
git status

git commit -m "commit message:
git push origin mybranchname
```

If you are at DBC, this branch should start with "pair-" You can type

```
git push origin pair<tab>
```

Git should fill in the name of the branch. If it doesn't auto-complete you are likely not in the correct branch.

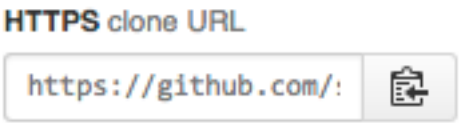
How do I push my local git repository up to my own GitHub account?

OK, so you've used git init or git clone to create a repository locally. Now you want to push it up to your GitHub account. I did this all the time to save a copy of all my work. First, go to your github account in the browser. You bookmarked it, right?

Click on the Repositories tab. Now create a new empty repository so you have somewhere to push to: click on:

or

Add an MIT license to it.
Copy the URL using the clipboard icon again:



Go back to the terminal window and create a readme if you don't have one yet:

```
echo "# Shortest description">> README.md
```

Make sure you have done a git status. Commit anything you need to.

```
git status
git commit -m "first commit"
```

Now type the following to add a new remote name for this repository, pasting in the URL you copied from GitHub.

```
git remote add upstream https://github.com/username/repo_name.git
git push -u upstream master
```

Remember that **both** parameters to a git push, the "origin master", "origin branch name" or "upstream master" refer to the remote. It's push current branch to *remote_repo remote_branch*

RSpec Cheat Sheet

```
require_relative 'grocery_list'

describe GroceryList do
  let(:groceries) { GroceryList.new }         #let is reset at every it clause
  it "has a list array" do
    expect(groceries.list).to be_a(Array)
  end

  context '#add' do
    item = “lettuce”                                  #item defined inside context only
    it "adds an item to the list array" do
      groceries.add(item)
      expect(groceries.list[0]).to eq("Lettuce")
    end
  end
  it "removes an item from the list array" do
    groceries.add("Yogurt")
    groceries.add("Gogurt")
    groceries.remove("Yogurt")
    expect(groceries.list[0]).to eq("Gogurt")
  end
end


#Checking inheritence example.  See matchers below:

describe "Dog" do
  describe "inheritance" do
    it "inherits from Pet" do
      expect(Dog < Pet).to be true
    end
end
```

Built-in Rspec matchers

Equivalence

```
expect(actual).to eq(expected)  # passes if actual == expected
expect(actual).to eql(expected) # passes if actual.eql?(expected)
expect(actual).not_to eql(not_expected) # passes if not(actual.eql?(expected))
```

Identity

```
expect(actual).to be(expected)    # passes if actual.equal?(expected)
expect(actual).to equal(expected) # passes if actual.equal?(expected)
Comparisons

expect(actual).to be >  expected
expect(actual).to be >= expected
expect(actual).to be <= expected
expect(actual).to be <  expected
expect(actual).to be_within(delta).of(expected)
```

Regular expressions

```
expect(actual).to match(/expression/)
```

Types/classes

```
expect(actual).to be_an_instance_of(expected) # passes if actual.class == expected
expect(actual).to be_a(expected)              # passes if actual.kind_of?(expected)
expect(actual).to be_an(expected)             # an alias for be_a
expect(actual).to be_a_kind_of(expected)      # another alias
```

Truthiness

```
expect(actual).to be_truthy   # passes if actual is truthy (not nil or false)
expect(actual).to be true     # passes if actual == true
expect(actual).to be_falsy    # passes if actual is falsy (nil or false)
expect(actual).to be false    # passes if actual == false
expect(actual).to be_nil      # passes if actual is nil
expect(actual).to_not be_nil  # passes if actual is not nil
```

Expecting errors

```
expect { ... }.to raise_error
expect { ... }.to raise_error(ErrorClass)
expect { ... }.to raise_error("message")
expect { ... }.to raise_error(ErrorClass, "message")
```

Expecting throws

```
expect { ... }.to throw_symbol
expect { ... }.to throw_symbol(:symbol)
expect { ... }.to throw_symbol(:symbol, 'value')
```

Yielding

```
expect { |b| 5.tap(&b) }.to yield_control # passes regardless of yielded args

expect { |b| yield_if_true(true, &b) }.to yield_with_no_args # passes only if no args are
yielded

expect { |b| 5.tap(&b) }.to yield_with_args(5)
expect { |b| 5.tap(&b) }.to yield_with_args(Fixnum)
expect { |b| "a string".tap(&b) }.to yield_with_args(/str/)

expect { |b| [1, 2, 3].each(&b) }.to yield_successive_args(1, 2, 3)
expect { |b| { :a => 1, :b => 2 }.each(&b) }.to yield_successive_args([:a, 1], [:b, 2])
```

Ranges

```
expect(1..10).to cover(3)
```

Collection membership

```
expect(actual).to include(expected)
expect(actual).to start_with(expected)
expect(actual).to end_with(expected)

expect(actual).to contain_exactly(individual, items)
```

ActiveRecord -

1) Active Record is a collection of Ruby classes that wraps an SQL database. Using the AR classes is easier than using SQL.
2) Using Active Record like this:
3) Is there a default AR directory structure setup? I.e. new AR app?
    1) Use SQL designer and create a schema
    2) Create some Ruby AR "migration" classes that define/create the database
    3) Create Ruby "Base" classes that represent the entities in your database (the Model)
    4) Use objects from those base classes instead of the database
4)
5)
6)
7)
8) AR applications have a rather consistent directory structure:

http://guides.rubyonrails.org/active_record_querying.html

```
Dog.all
Dog.where(age: 1)
      The SQL executed was SELECT "dogs".* FROM "dogs" WHERE "dogs"."age" = 1.

Dog.where("age = ? and name like ?", 1, '%Te%')
Dog.order(age: :desc)
Dog.limit(2)
Dog.count
Dog.pluck(:name, :age)
Dog.first
Dog.find(1)
Dog.order(name: :asc).where(age: 1).limit(1)
Dog.create([{name: “Spot”, age: 1}, {name: “Cosmo”}])
Dog.find_or_initialize_by(name: “Tenley”, license: “OH-9384764”)
Dog.find_or_create_by() # will try to save a new obj
#Once you have an instance, AR creates getter and setter methods for all attributes
henley = Dog.find_by(name: “Henley”)
henley
henley

ActiveRecord::Base.connection.tables           #the table in the DB


class Rating < ActiveRecord::Base

  belongs_to :dog

end
gives us rating.dog and rating.dog =
#build_dog, #create_dog, and #create_dog!
```

```
In ratings:
belongs_to :dog, { :class_name => "Dog", :foreign_key => :dog_id }
belongs_to :judge, { :class_name => "People", :foreign_key => :judge_id }
```