CS 4990: Ruby on Rails Web Application Development

Assignment: Game of Life

Requirements

You will be implementing John Conway’s Game of Life in the form of a Ruby program. You are required to implement the Ruby program from scratch, but you’re welcome to reference implementations written in other languages, such as this one written in Python. Your program must run using the Ruby interpreter and render output identical to the Python implementation.

Before you start, familiarize yourself with the Game of Life and its rules. The Rules section in the Game of Life Wikipedia article provides a good overview, and the Examples section shows some helpful visual animations.

What your program must have:

- At least one Ruby class to contain your game logic
- Public instance methods to define a class interface
- Private instance methods to encapsulate internal logic
- At least one instance variable to store your game data
- At least one Array, one Hash, and one Set to structure your data
- Rather than using static strings like "alive", use a symbol instead: :alive
- When you need to build strings like "4,7", use Ruby’s string interpolation feature: "#{x},#{y}" ...

What your program cannot have:

- No while, until, or for loops are allowed. Instead, take this opportunity to learn about Ruby blocks and the loop iterator, the times iterator, and the each iterator.

- No return statements are allowed. In Ruby, explicit return statements are almost never needed. That’s because, in Ruby, the last statement evaluated by a method becomes the return value for that method. As an exercise, avoid using the return keyword at all, because you won’t need it for this assignment.

Hints and Tips

- Before you start, run the Python program and familiarize yourself with the Python code. The purpose of this assignment is to help you learn and use Ruby, not to invent a solution to the Game of Life. Simply copy the Python solution and implement it using Ruby.

- Keep the following Python -> Ruby translation freebies in mind while you code:
  
  - In Python, one creates a set like this: my_set = set(). In Ruby, first add require 'set' to the top of the file and then create the set like this: my_set = Set.new
  
  - In Python, one might clear the console like this: call("clear"). In Ruby, one could do this: system("clear")
  
  - In Python, time.sleep(0.1) causes the program to sleep. In Ruby, simply use: sleep 0.1

Resources

- Game of Life on Wikipedia
- Game of Life implemented in Python
- The Core API documentation for Ruby 2.1.2.
- This interactive tutorial is an excellent way to learn the basics of Ruby for the first time, and it only takes 15-20 minutes to complete. Since you’re just getting started with Ruby, a little extra practice might go a long way.

- This is another great tutorial called Ruby in Twenty Minutes that aims to teach you the basics of Ruby in no more than 20 minutes using IRB (Interactive Ruby).
Submission

- Show your completed assignment to the instructor during class or office hours to receive credit.