So far in this course we have used Sage to explore various areas of mathematics: infinite sums, prime numbers, divisors, probability, geometric probability, sums of squares, approximations to pi (just to name a few). For this Write-Up I want you to pick something that you want to explore and write some code that does this. It can be a variation on some of the themes we have already seen, or something completely different. Please explain—via comments added in your Sage code—what questions you are trying to explore and what answers you obtain.

When I assign open-ended projects like this, a certain number of students focus on doing the smallest amount of work possible that meets the minimum requirements. For example, “I am going to explore what happens when I add the numbers from 1 to 100”. I guess that counts as exploring something, but it is very simple-minded and doesn’t require any kind of substantial investigation.

Full credit for this assignment will be 9 points, divided up as follows:

- Depth of subject: 3 pts
- Depth of code used: 3 pts
- Depth of observations and analysis: 3 pts.

If all you do is write code that adds up the numbers from 1 to 100, you would probably get 1/1/0 in the three categories and so 2/9 for the assignment.

We have learned to use various features of Sage code: while and for loops, if and else conditionals, list manipulations, random number generation, graphics commands, and printing commands. By “depth of code” I mean that I want to see code that uses a fair number of these things.

By “observations and analysis” I mean that I want your explorations to involve some kind of search for patterns, or interpreting output, or asking questions about the output. You don’t have to have answers for everything, but I want to see some kind of thoughtful questions and exploration.

As with everything in this course, you will not be penalized on the first submission as long as you make a reasonable effort. So you can get full credit for submitting Write-Up #2 as long as you turn it in on November 14th and get to at least 4/9 in your points (less than that doesn’t feel like a reasonable effort). If you don’t make the full 9-points in your original submission, you can always make the rest up when you resubmit as part of your Final Portfolio.

Of course you should feel free to ask me questions or for coding help while you are working on this.