CSE 13S: Assignment 1 Write Up

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Introduction

As a novice in the realm of Unix systems and C syntax, I embarked on a journey of discovery and exploration with the assignment at hand. Utilizing various tools such as gnuplot, Bash, and the provided C program, I set out to plot tens of thousands of points to familiarize myself with the intricacies and nuances of these powerful programs.

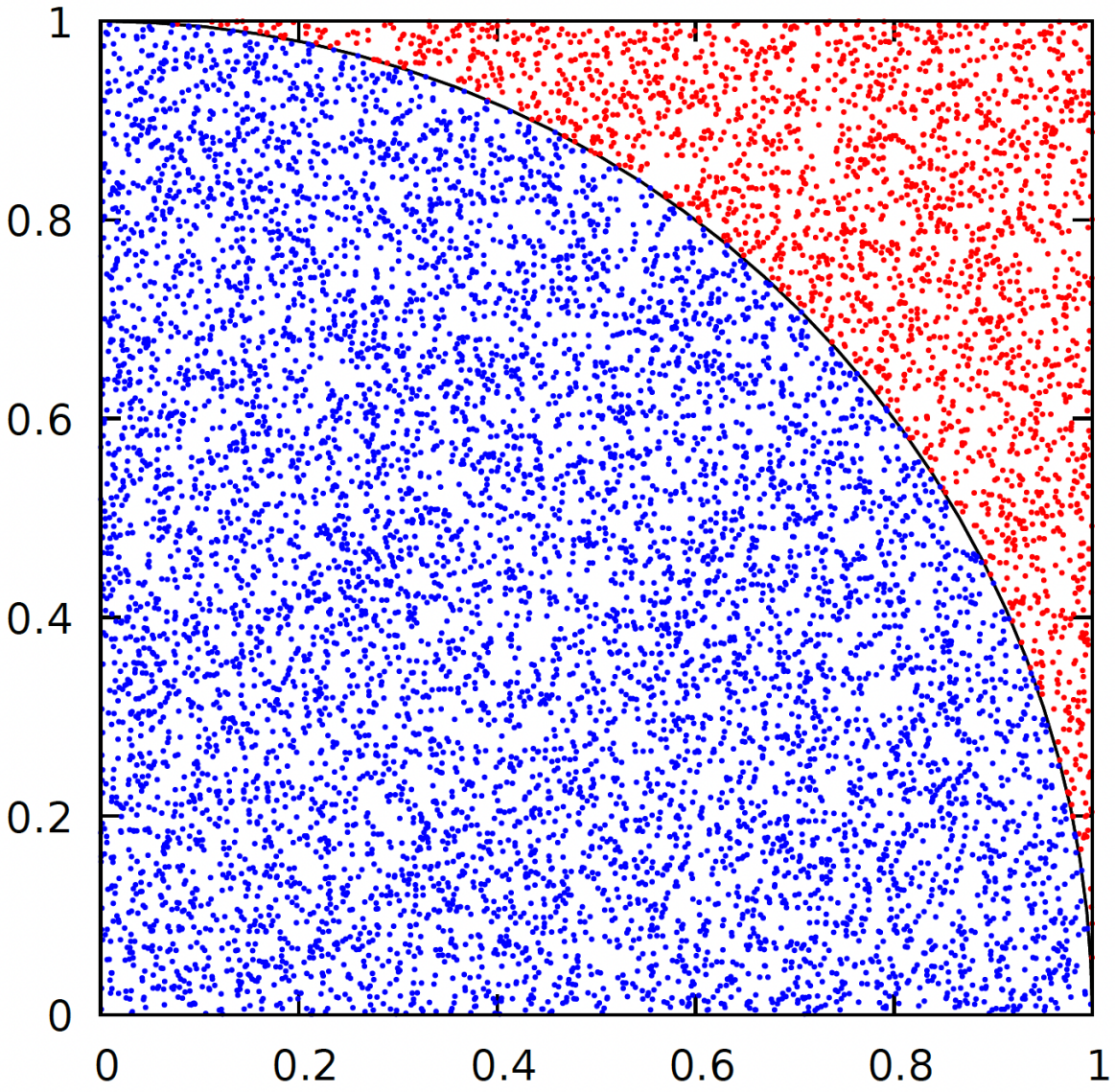
Despite my initial excitement, the learning curve proved to be steep as I encountered obstacles and roadblocks along the way. Operating within the constraints of a virtual machine (VM), I struggled to reconcile the inconsistencies and lack of cohesion between the various programs and files provided. For instance, the original plot.sh file, intended to work in conjunction with sincos.c, failed to run due to my VM's lack of the make software. This was a frustrating and disheartening experience, as the absence of this crucial piece of software was not mentioned in either the assignment 0 or assignment 1 pdfs, and it took me several days to identify and rectify the issue.

However, through perseverance and determination, I was able to overcome these challenges and gain a deeper understanding of the intricacies and complexities of Unix systems and C syntax. Despite the difficulties encountered, I am grateful for the opportunity to expand my knowledge and skills in this field, and look forward to further honing my abilities in the future.

Programs

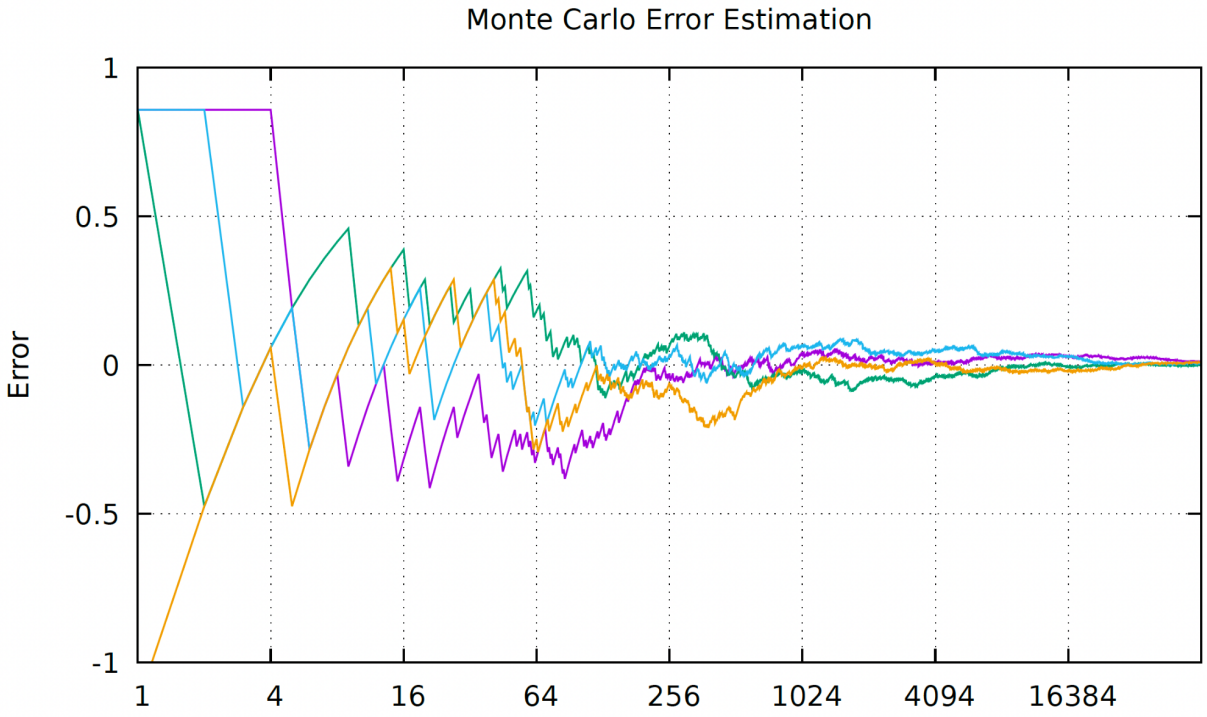
As I continue to delve deeper into the intricacies of the nvim environment, I am beginning to acclimate myself to its unique characteristics and functionalities. This gradual process of assimilation is evidenced by my increasing proficiency in utilizing the arrow keys to navigate through my README.md and LaTeX files, indicative of a growing level of comfort and familiarity with the vim interface. However, it is clear that there remains a significant margin for improvement, as I am still in the nascent stages of mastering this powerful and versatile tool.

First Graph



The initial stage of graph creation involves the utilization of a script that selectively extracts specific columns, namely the third, fourth, and fifth, from the original data file and discards the first row. Subsequently, the points are classified and separated based on their proximity to the circle, with those falling within the circle being assigned to one file and those outside of it being assigned to another. These files are then plotted using the powerful command-line and graphical user interface graphing utility, gnuplot, resulting in a cohesive visual representation of the data. Aesthetically, the plotted points are color-coded to enhance the overall visual appeal of the graph.

Second Graph



In order to generate the second error estimation graph, the script initiates a series of iterations of the C program, utilizing the Monte Carlo method, with a randomized selection of x and y coordinates. The output of these iterations is processed to extract the first and second columns, which correspond to the iteration number and the program's estimation of pi, respectively. Subsequently, the value of pi is subtracted from the second column, resulting in a representation of the absolute error. This process is repeated four times, producing four independent data sets, which are subsequently plotted in a line graph format utilizing gnuplot. The y-axis of the graph displays the absolute error, with a range of [-1, 1], while the x-axis corresponds to the respective iterations.

Sources

- Dr. Long's discord code
- Manual Pages
- Learn Enough Developer Tools to be Dangerous
- Various Stack Overflow Pages
- Provided Assignment Files
- A Few Quora Pages Surprisingly