Assignment 1 Design

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1 Introduction

In this assignment, we will be using a provided Monte Carlo estimation C program to create interesting graphs with the data outputted by the program. We will be using gnu-plot to plot data and create these graphs.

2 Psuedocode

This section shows the process for the first plot, which displays how many points in a Monte Carlo simulations fall within a circle of radius 1 centered around the origin. Dividing the number of inner points by the number of outer points estimates π.

```
make required files
run monte carlo with a high n # of points, direct output into output.dat
use awk on output.dat to print only 3rd and 4th columns with the x and y coords
direct output of above
remove the column headers ("x" and "y") using tail, put in coordinates.dat
use awk to seperate coordinates in
```

3 Conclusion

$$\tan^{-1} x = x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \frac{x^9}{9} - \frac{x^{11}}{11} + \frac{x^{13}}{13} - \frac{x^{15}}{15} + \frac{x^{17}}{17} - \frac{x^{19}}{19} + O\left(x^{21}\right)$$