Assignment 1: Getting Acquainted with UNIX and C
Writeup
Prof Veenstra
Nguyen Vu
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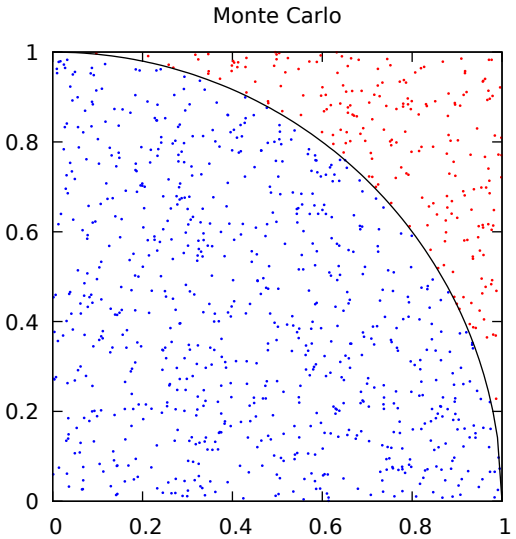
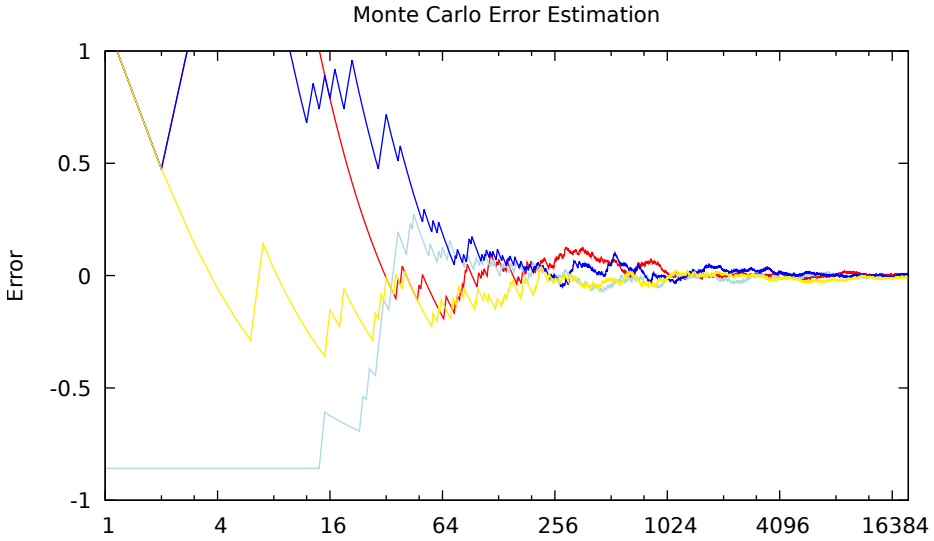
This is the output of the first plot



UNIX commands I chose to use for this plot:
make clean: uses the command from Makefile to clear up the old data files from previous run
make monte_carlo: uses command from Makefile to make monte_carlo.c into clang format and run it and make the monte_carlo program clang format
./monte_carlo -n 1000 ¿ data.dat: to create a data.dat file with 1000 iterations
awk '{print $3 " " $4 " " $5}' data.dat >monte_carlo.dat: get column 3, 4 and 5 from data.dat file and put into monte_carlo.dat file set terminal pdf: to make the output file a pdf
set size square: to make the output layout a square
set key autotitle columnhead: to set the first row into title instead of data
unset key: to remove the x and y axis labels
set output "figure2.pdf": to name the output
set title "Monte Carlo": to set the graph title
set xrange [0:1]: to set the range for x axis
set yrange [0:1]: to set the range for y axis

set palette defined (0 "#FF0000", 1 "#0000FF"): to set the color for dots inside of the quarter circle to be blue and dots outside of the quarter circle to be red
unset colorbox: to remove the colorbox at the right of the plot
plot "monte_carlo.dat" with dots linecolor palette, [x=0:1] sqrt(1-x**2) with lines linecolor rgb "#000000": plot the figure2 plot using the monte_carlo.dat file and the quarter circle with black line

This is the output of the second plot



./monte_carlo -n 20000 -r "$RANDOM" >tempdata1.dat: to create the 1st tempdata.dat file for the output of monte_carlo.c with 20000 iterations and a random seed
./monte_carlo -n 20000 -r "$RANDOM" >tempdata2.dat: to create the 2nd tempdata.dat file for the output of monte_carlo.c with 20000 iterations and a random seed
./monte_carlo -n 20000 -r "$RANDOM" >tempdata3.dat: to create the 3rd tempdata.dat file for the output of monte_carlo.c with 20000 iterations and a random seed
./monte_carlo -n 20000 -r "$RANDOM" >tempdata4.dat: to create the 4th tempdata.dat file for the output of monte_carlo.c with 20000 iterations and a random seed
awk '{PI = 3.141592654} NR!=1 {print $1 " " PI - $2}' tempdata1.dat

>data1.dat: to remove the first row, get column 1 and pi minus column 2 from the 1st tempdata.dat file and put them in the 1st data.dat file
awk '{PI = 3.141592654} NR!=1 {print $1 " " PI - $2}' tempdata2.dat >data2.dat: to remove the first row, get column 1 and pi minus column 2 from the 2nd tempdata.dat file and put them in the 2nd data.dat file
awk '{PI = 3.141592654} NR!=1 {print $1 " " PI - $2}' tempdata3.dat >data3.dat: to remove the first row, get column 1 and pi minus column 2 from the 3rd tempdata.dat file and put them in the 3rd data.dat file
awk '{PI = 3.141592654} NR!=1 {print $1 " " PI - $2}' tempdata4.dat >data4.dat: to remove the first row, get column 1 and pi minus column 2 from the 4th tempdata.dat file and put them in the 4th data.dat file
set terminal pdf: to set the output to pdf file
set output "figure3.pdf": to name the output
set title "Monte Carlo Error Estimation": to set the plot title
set logscale x 4: to set the x axis scales to the squares of 4
set xrange [1:20000]: to set the range for x axis
set ylabel "Error": to label the y axis "Error"
set yrange [-1:1]: to set the range for y axis
plot "data1.dat" title "" with lines linecolor rgb "#FF0000", "data2.dat" title "" with lines linecolor rgb "#ADD8E6", "data3.dat" title "" with lines linecolor rgb "#0000FF", "data4.dat" title "" with lines linecolor rgb "#FFF000": plot all 4 data sets using lines with different colors for each one