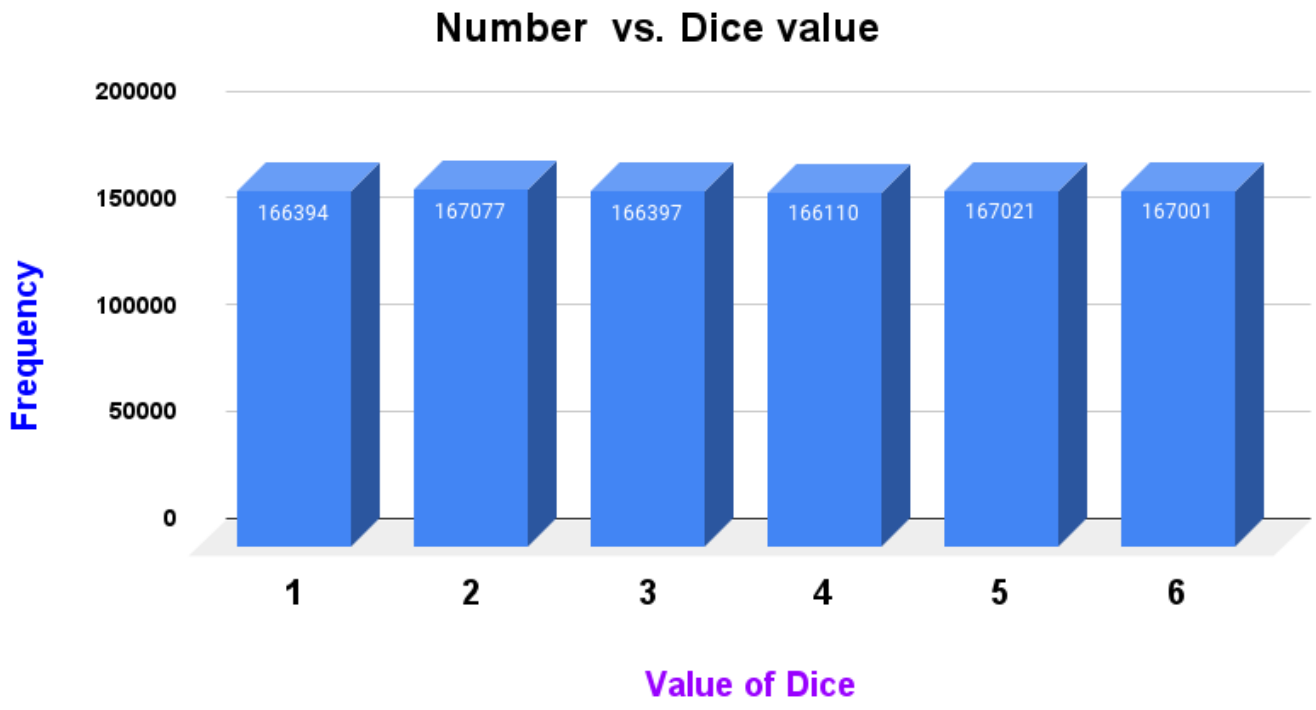
Computer Programming

Assignment-4

SECTION-1

NAME : NAGA MANOHAR
ROLL.NO : 2021101128

Question1:



FREQUENCY OF 1: 166394
FREQUENCY OF 2: 167077
FREQUENCY OF 3: 166397
FREQUENCY OF 4: 166110
FREQUENCY OF 5: 167021
FREQUENCY OF 6: 167001

PROBABILITY OF 1: 1.66394
PROBABILITY OF 2: 1.67077
PROBABILITY OF 3: 1.66397
PROBABILITY OF 4: 1.66110
PROBABILITY OF 5: 1.67021
PROBABILITY OF 6: 1.67001

So from the Above Statistics when the Dice is Thrown for
Very Large Number of Times(**N=1 Million times**) the PROBABILITY of getting any value on the Dice is **EQUALLY LIKELY** and it is

== 1.6 = ⅙

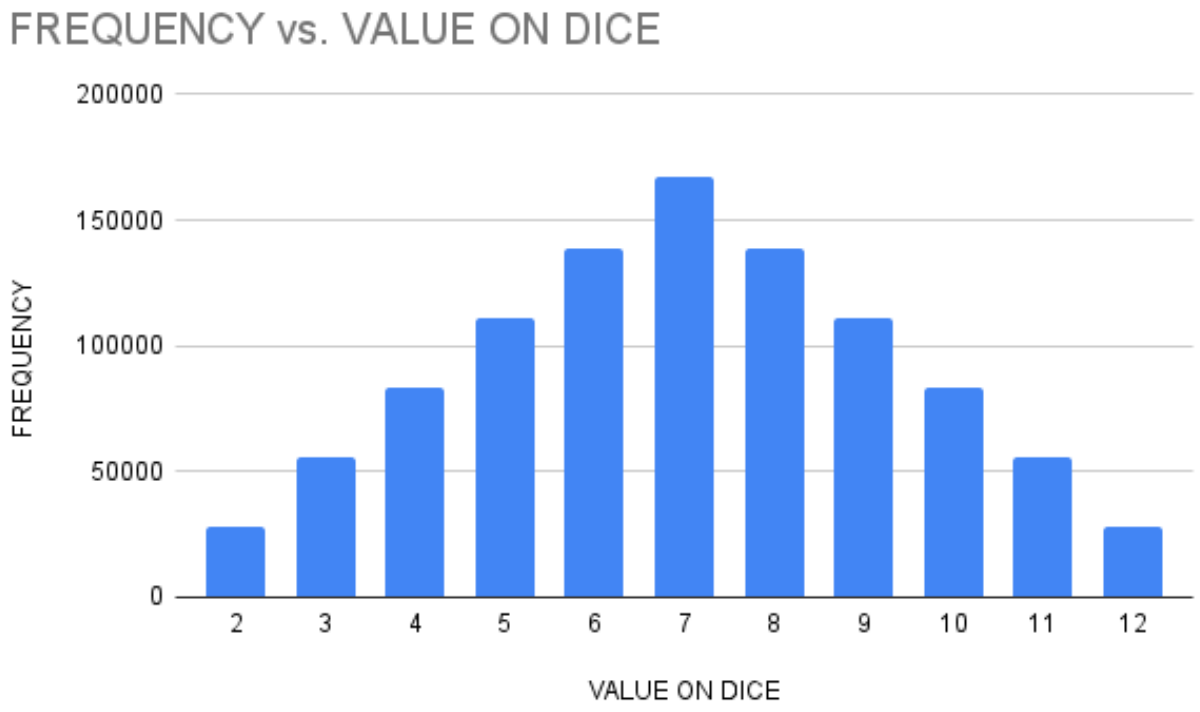
Question2:

VALUE ON DICE	FREQUENCY	PROBABILITY	Expected PROBABILITY
2	27696	0.027696	1/36 = 0.027
3	55517	0.055517	2/36 = 0.055
4	83086	0.083086	3/36 = 0.083
5	111044	0.111044	4/36 = 0.111
6	138894	0.138894	5/36 = 0.138
7	166901	0.166901	6/36 = 0.166
8	139126	0.139126	5/36 = 0.138
9	111164	0.111164	4/36 = 0.111
10	83246	0.083246	3/36 = 0.083
11	55644	0.055644	2/36 = 0.055
12	27682	0.027682	1/36 = 0.027

So from the Above Statistics for 2-DICE Thrown for N=1 Million Times the PROBABILITY of getting a value as sum as the SUM VALUE moves from **2_to_7**

SUM=7; HAS MAXIMUM PROBABILITY

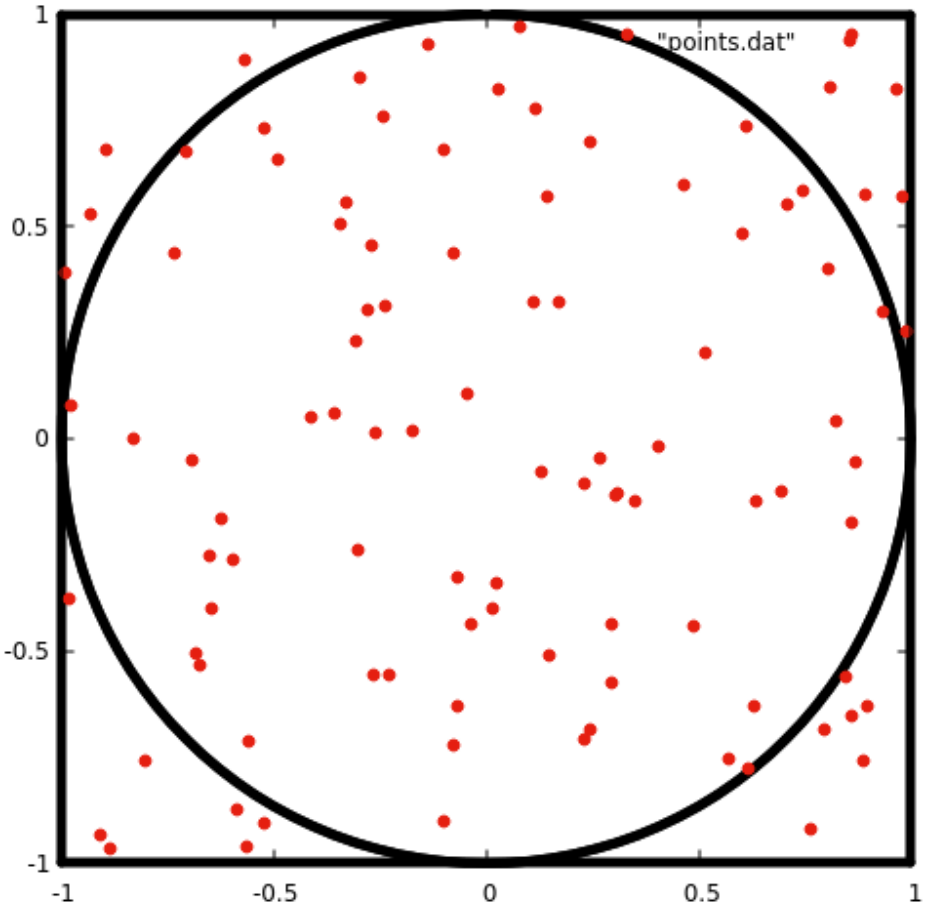
Then again the PROBABILITY decreases as SUM VALUE moves from **8_to_12**
We can Get the Expected PROBABILITY by taking all combination of SUM VALUES.Thus the **Experimental Values Match with Expected values;**
As shown in the Below HIstogram:



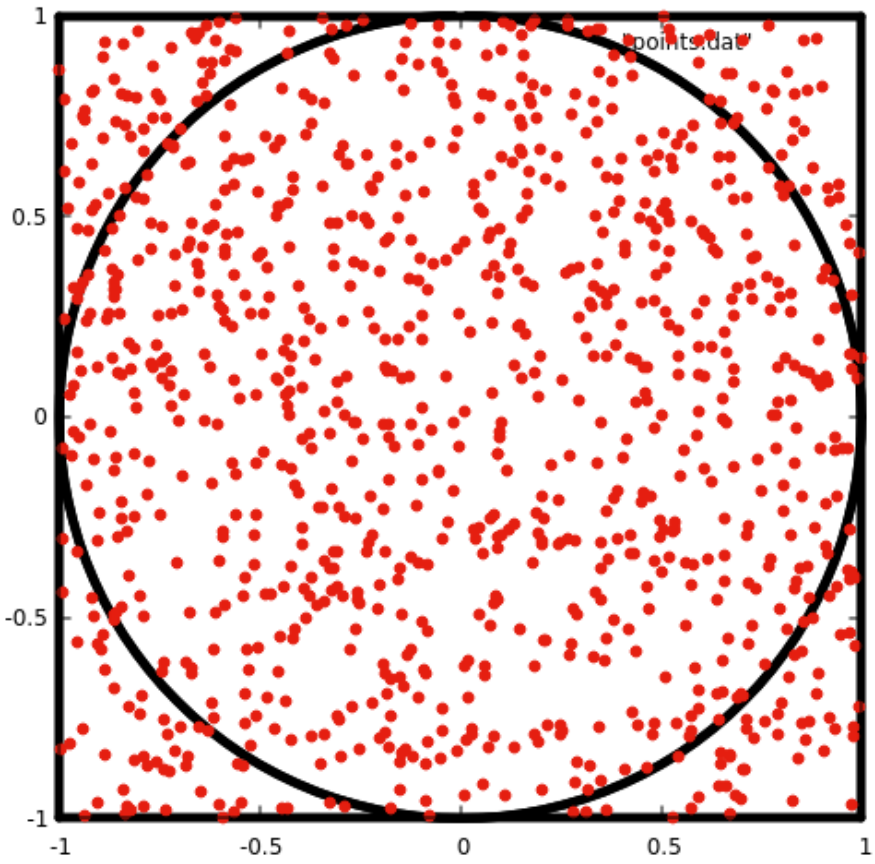
Question3:

No. of Sample Points	Value of PI
100	2.720000000
1000	3.088000000
10000	3.119200000
100000	3.143120000

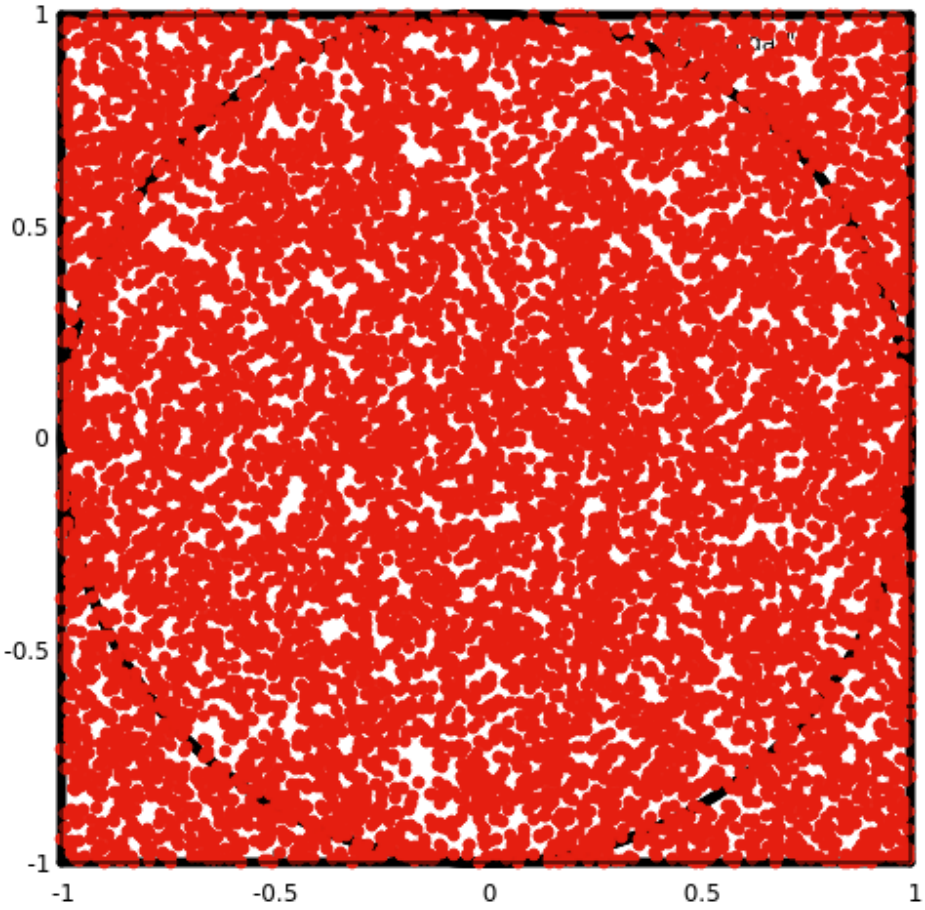
From the Above data We can Say that the Approximate PI value gets Closer to the Actual PI Value As we increase the Number of Sample Points.
Actual PI VALUE = 3.14159265358979323846264338327950288419716939937510...



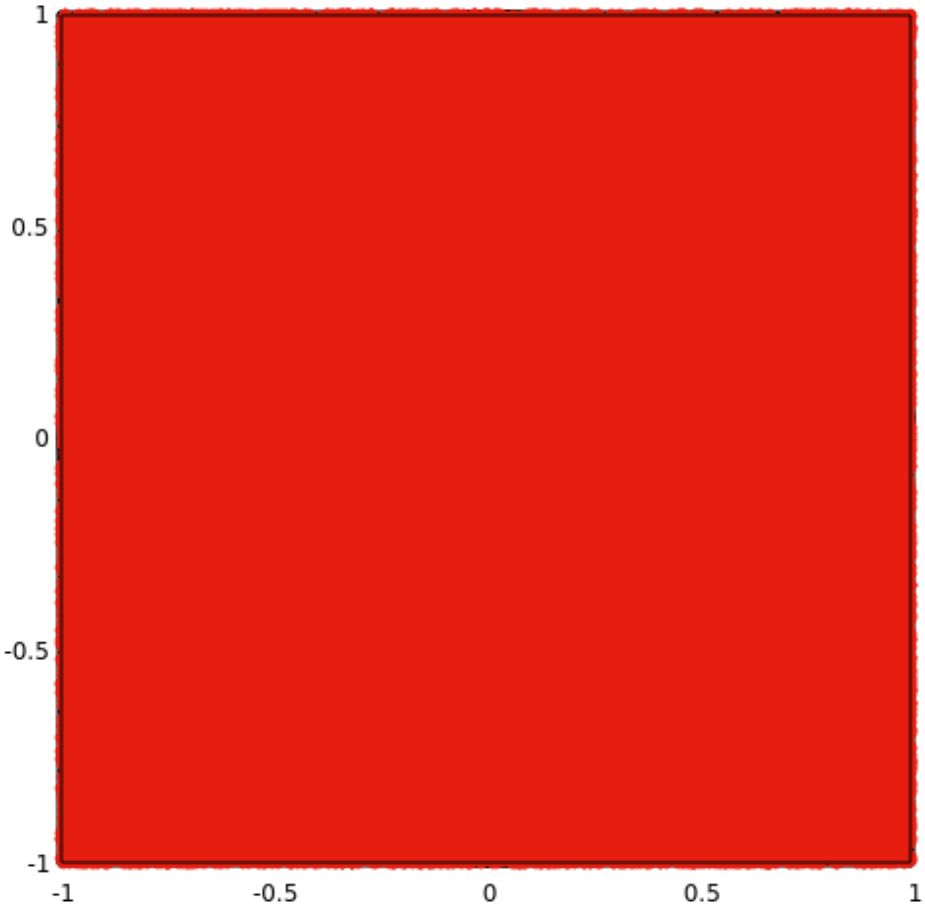
No. of Sample Points = 100



No. of Sample Points = 1000



No. of Sample Points = 10000



No. of Sample Points = 100000

(HERE THERE ARE SO MANY POINTS THAT THE CIRCLE IS NOT VISIBLE)

I HAVE USED THE FOLLOWING COMMANDS TO PLOT QUESTION3

GNUPLOT

Terminal Commands-->

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

```
gnuplot
set size ratio -1
set parametric
set xrange [-1:1]
set yrange [-1:1]
plot "points.dat" linetype 7 lc 7 w p
set arrow 1 from 1,1 to -1,1 nohead lw 5 linetype rgb "black"
replot
set arrow 2 from 1,1 to 1,-1 nohead lw 5 linetype rgb "black"
replot
```

set arrow 3 from -1,-1 to -1,1 nohead lw 5 linetype rgb "black"
replot
set arrow 4 from -1,-1 to 1,-1 nohead lw 5 linetype rgb "black"
set size ratio -1
set object 5 circle at 0,0 size 1 fc rgb "black" lw 5
replot

$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
4 - arrows will draw the **square** required
set object will draw the **circle** required

"points.dat" file contains the sample points to be plotted as x<space>y
=> it is generated during run time by the **3.c** program itself
I am attaching it also as a sample for N=10000