PHYS338:Computational Physics HW2

Student Name: Hamza AlHasan-1181636

Submission Date: September 30, 2020

Question 1

The used nuclei are:

- A is Carbon 14
- B is Radium 226
- C is Plutonium 239

The first table is for the averaged values of Half Life (in sec) for different N, with different nuclei.

	A	B	C
Exp HL	1.777300e11	5.134424e10	7.534208e11
HL for $N = 10^2$	1.764438e11	5.201744e10	7.347240e11
HL for $N = 10^3$	1.712631e11	5.175446e10	7.226480e11
HL for $N = 10^4$	1.702164e11	5.138629e10	7.161787e11
HL for $N = 10^5$	1.707792e11	5.124428e10	7.172832e11

The second table is for the errors (sigma-standard deviation) for each value.

	A	B	C
HL error for $N = 10^2$	2.28584e10	6.64163e9	1.03054e11
HL error for $N = 10^3$	7.85555e9	2.33155e9	3.52289e10
HL error for $N = 10^4$	2.27931e9	6.40076e8	1.18998e10
HL error for $N = 10^5$	9.35164e8	3.00765e8	3.31801e9

What we can notice here, is that the errors are decreased by increasing N, that is, more experiments done less errors have.

We cannot predict which averaged value will be closest to Exp value, because the operations depend on the rand() function in C.