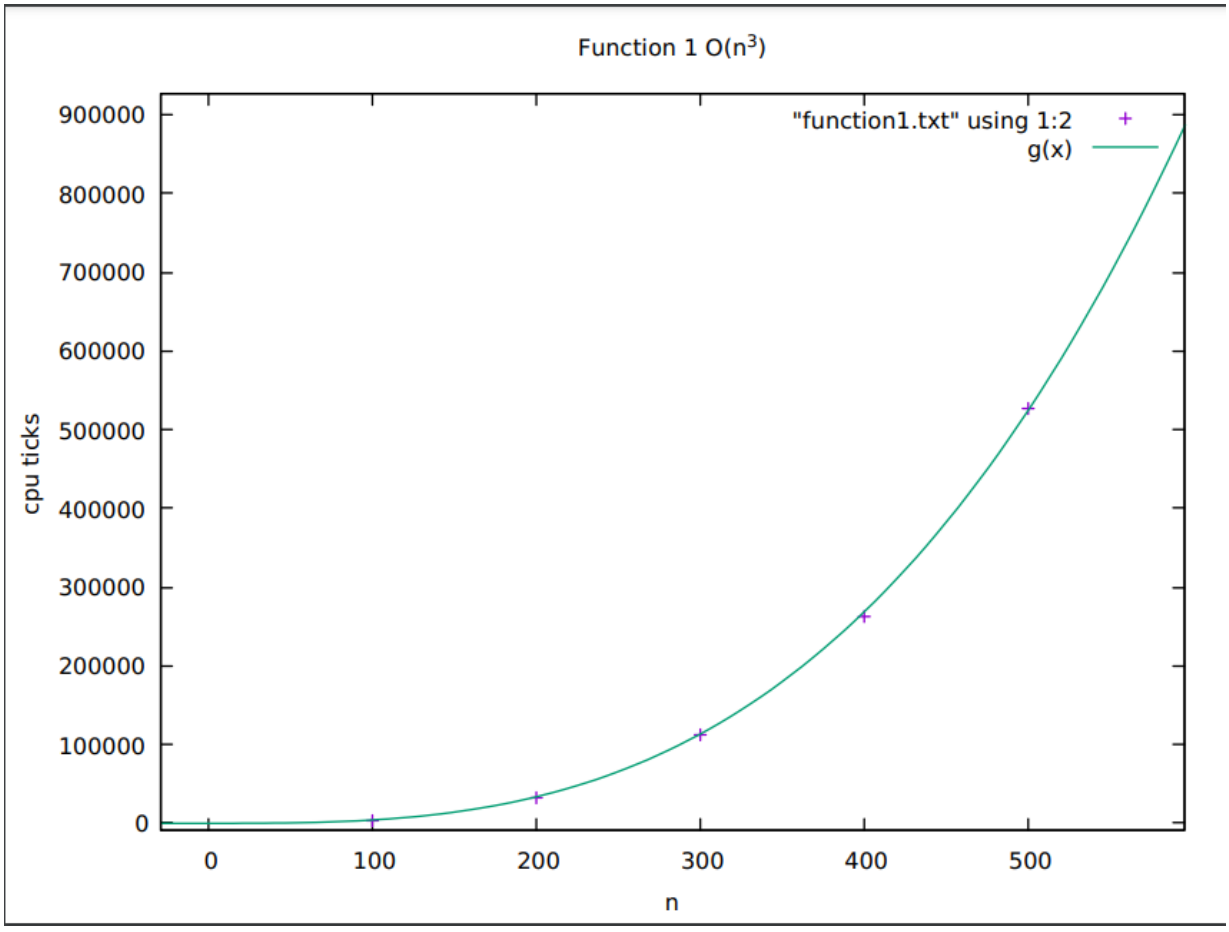
Blackbox Summary

Intro
Given seven functions that I was unable to look into, I wrote code in order to test multiple different values in each function and determine their time complexity in terms of O(n).

Function 1:

N size used	Ticks taken
100	4509
200	32510
300	111722
400	261939
500	526810

Function Used: g(x) = c * x^3
C value = 0.00418701
Asymptotic Error = 0.5953%

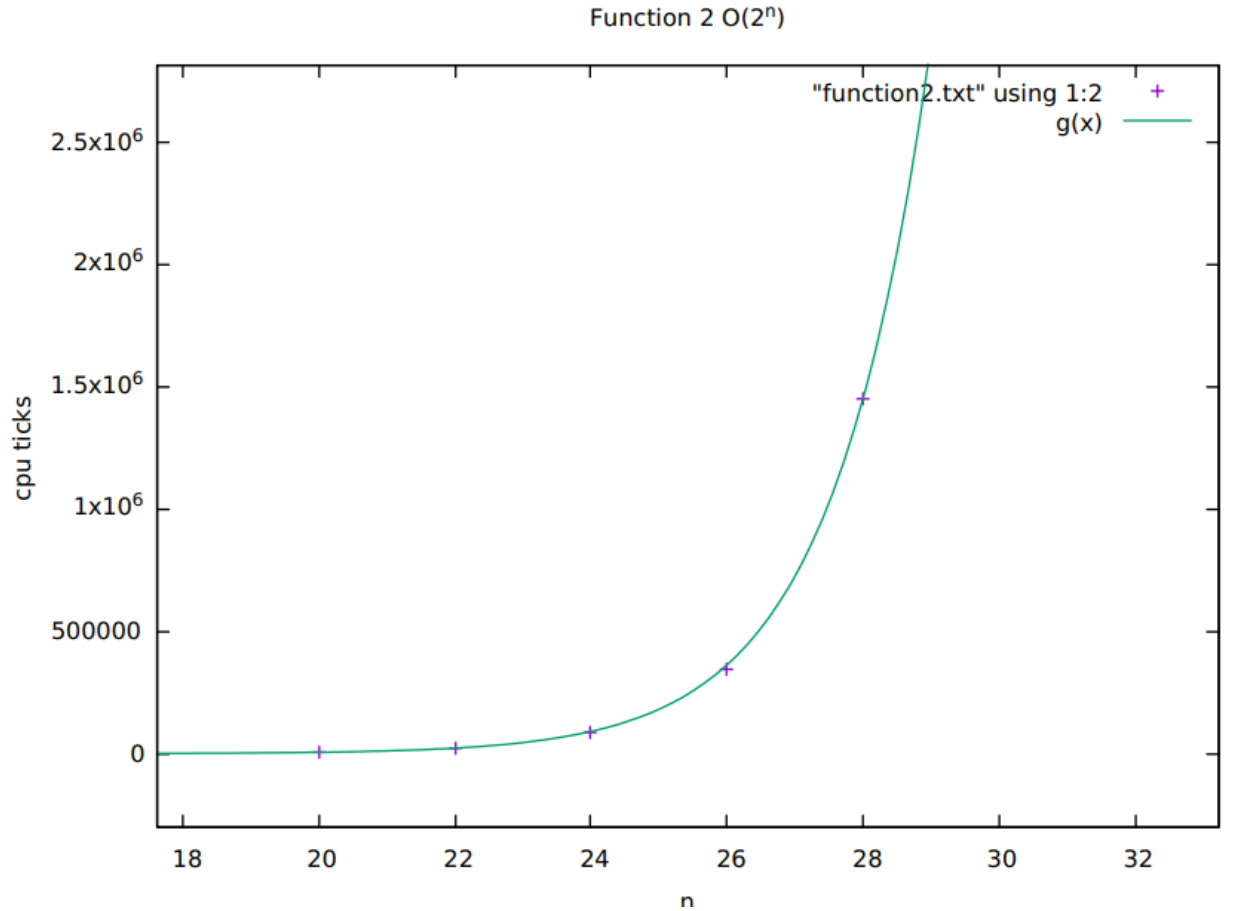


Based on the data collected, function 1 has a complexity of O(n^3).

Function 2

N size used	Ticks taken
20	5795
22	22405
24	86619
26	347773
28	1453268

Function Used: g(x) = c * 2^x
C value = 0.00539934
Asymptotic Error = 0.521%

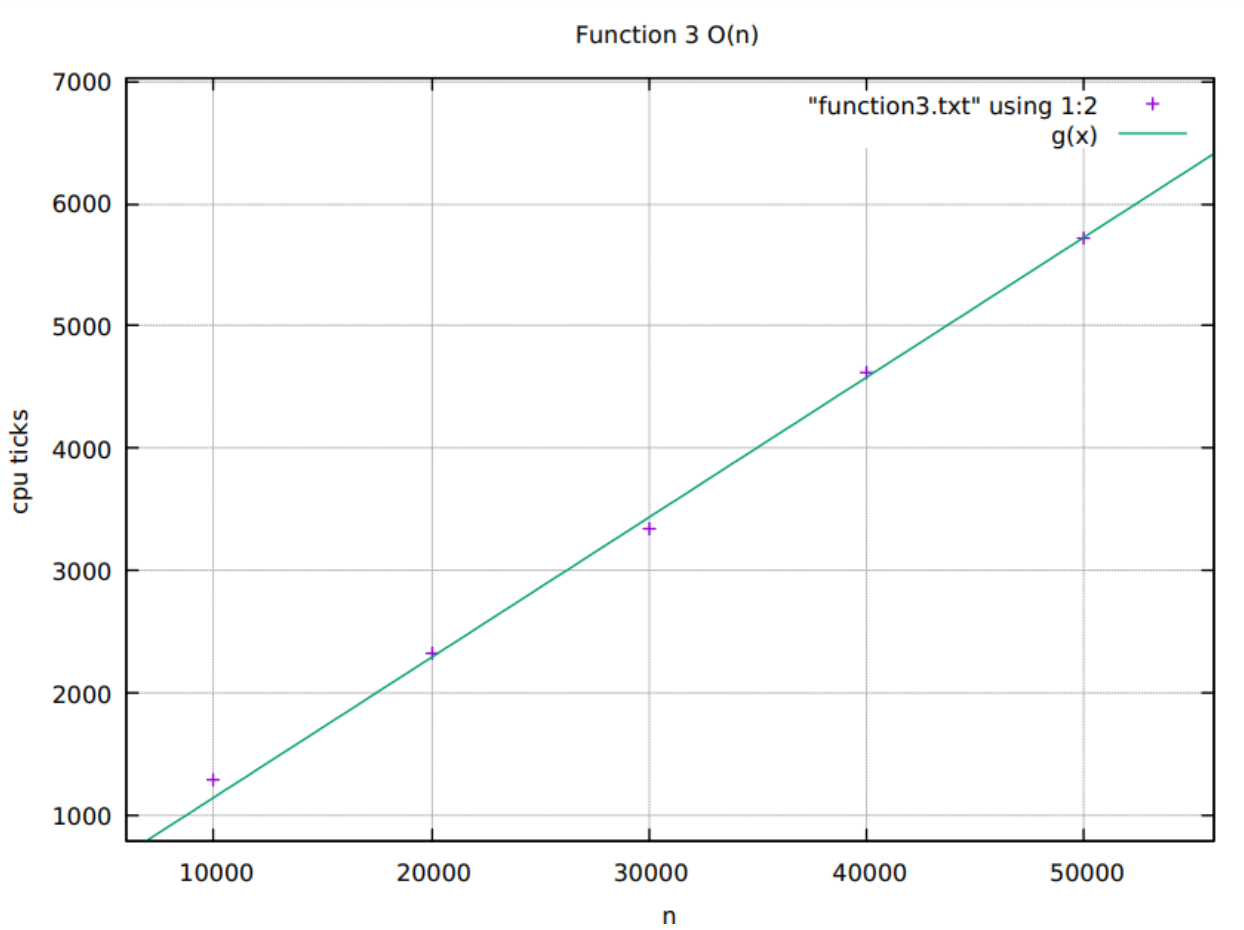


Based on the data, function 2 has a complexity of O(2^n).

Function 3

N size used	Ticks taken
10000	1294
20000	2331
30000	3341
40000	4611
50000	5712

Function Used: g(x) = c * x
C value = 0.114515
Asymptotic Error =1.083%

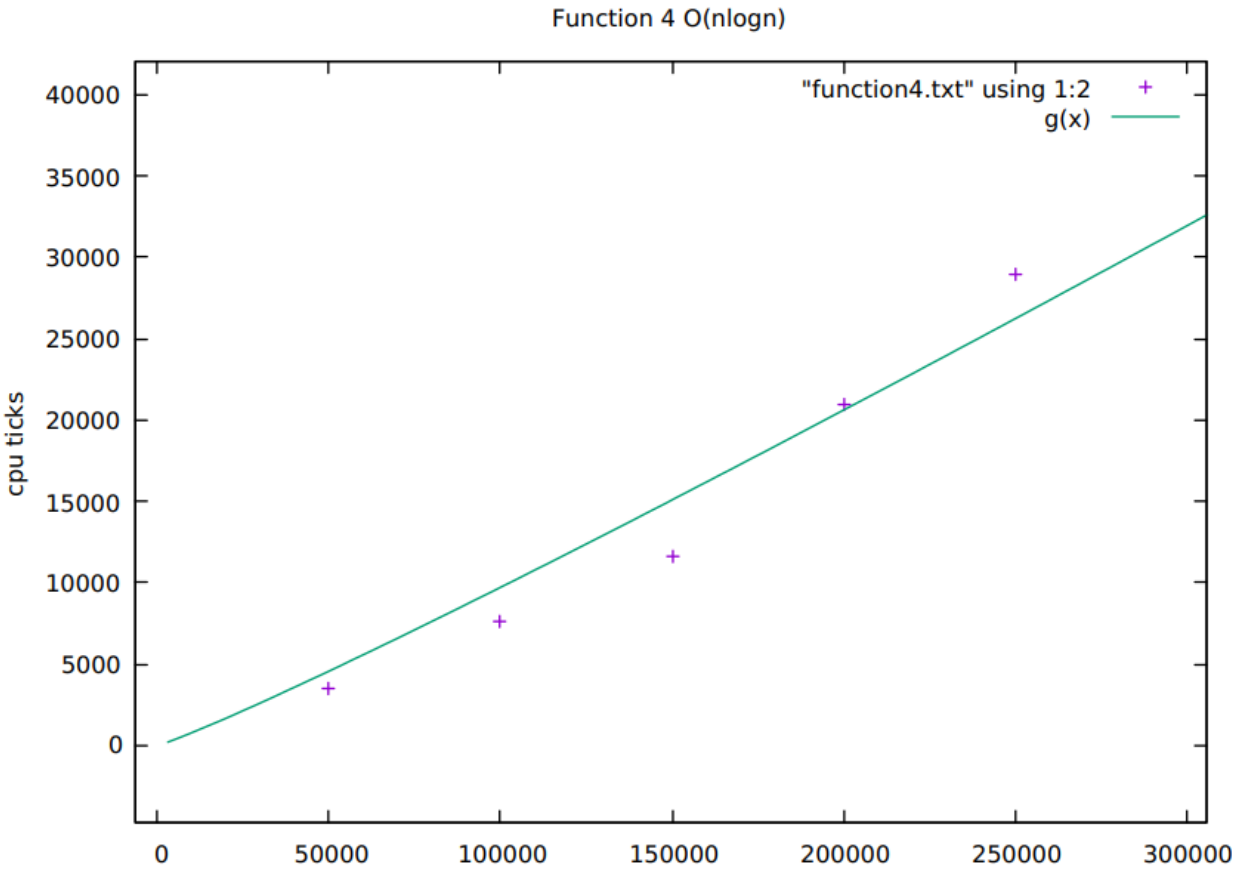


Based on the data, function 3 has a complexity of O(n).

Function 4

N size used	Ticks taken
50000	3445
100000	7604
150000	11604
200000	20893
250000	28949

Function Used: g(x) = c * x * logx
C value = 0.00843508
Asymptotic Error =6.605%



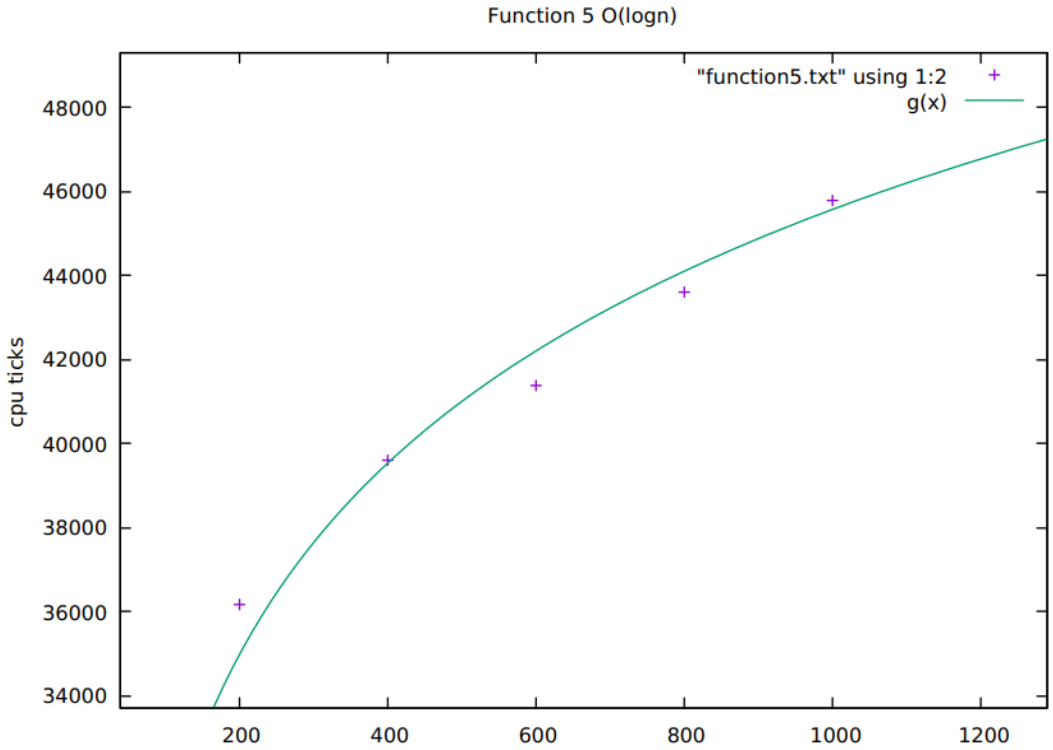
Based on the data, function 4 has a complexity of O(nlogn).

Function 5

N size used	Ticks taken
200	36171
400	39610
600	41399
800	43599
1000	45775

Function Used: g(x) = c * logx

C value = 6596.52
Asymptotic Error =0.8402%

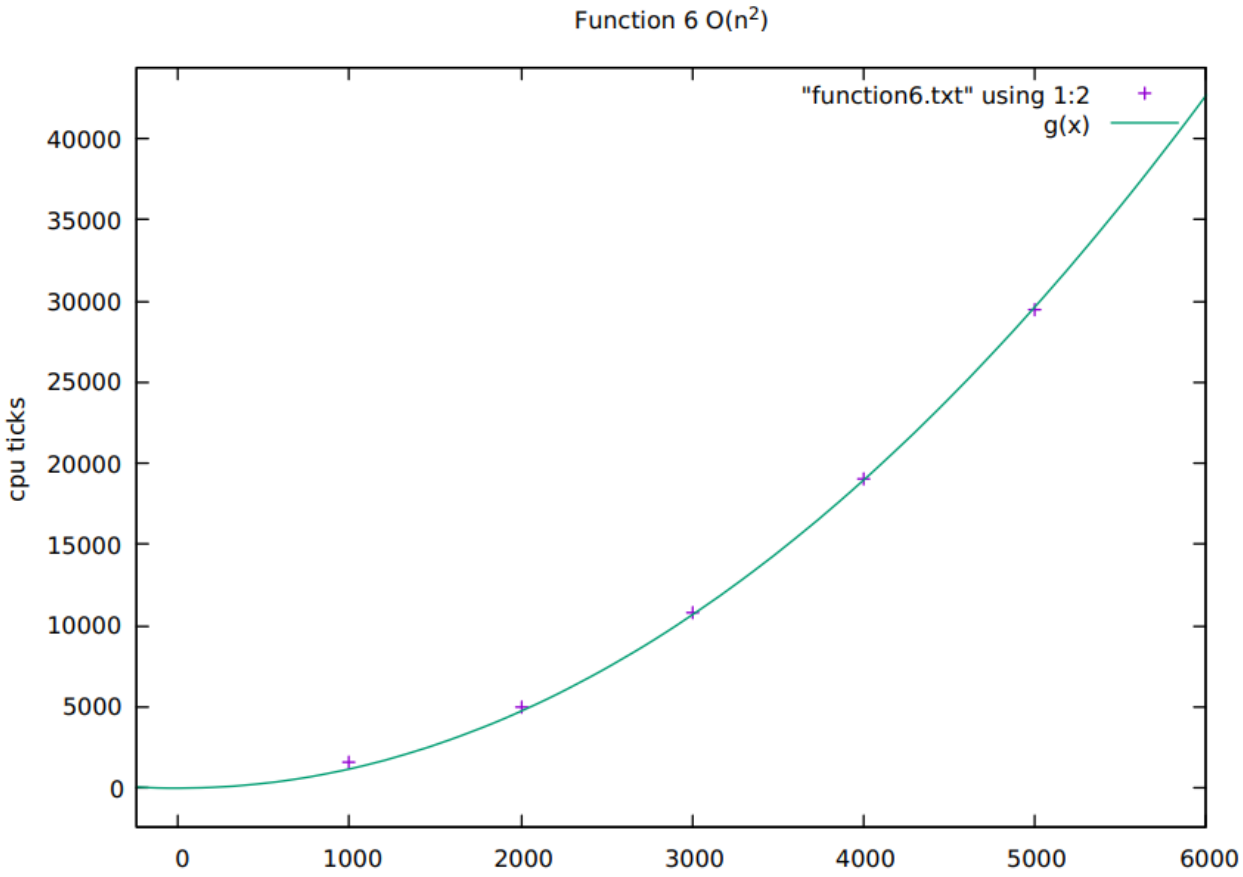


Based on the data function 5 has a complexity of O(logn)

Function 6

N size used	Ticks taken
1000	1574
2000	5035
3000	10780
4000	19047
5000	29420

Function Used: g(x) = c * x^2
C value = 0.00118385
Asymptotic Error =0.7392%



Based on the data function 6 has a complexity of O(n^2).

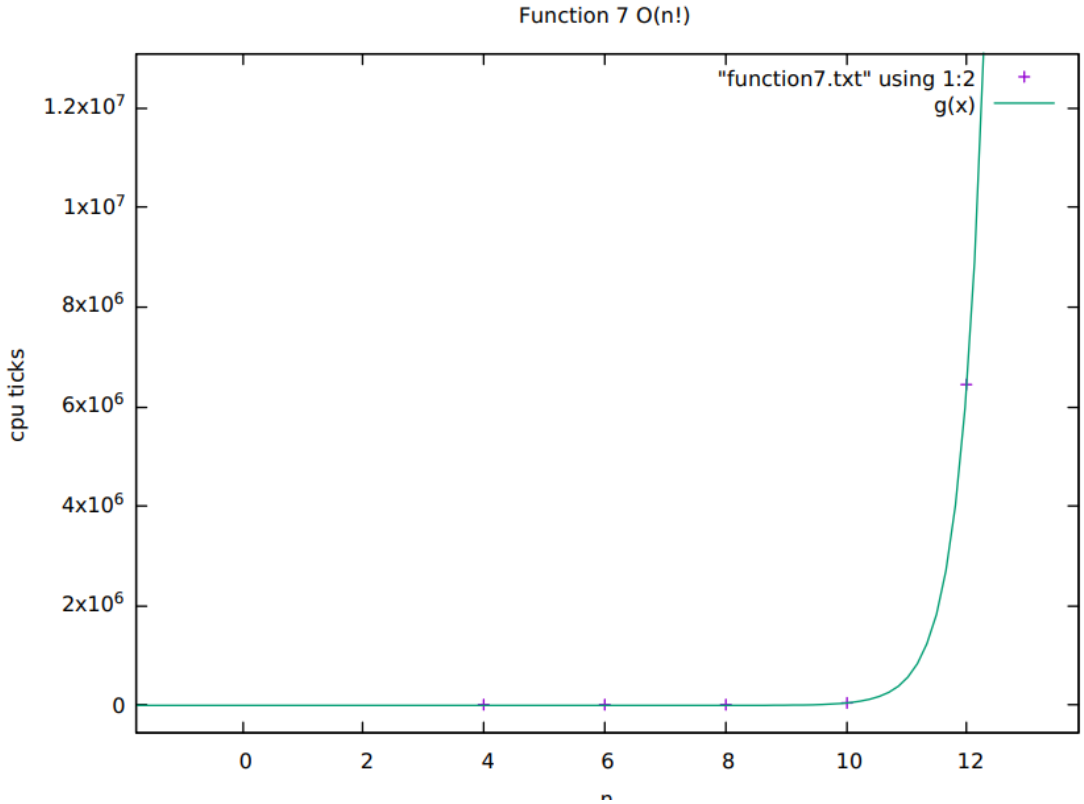
Function 7

4 318
6 359
8 970
10 57638
12 6451561

N size used	Ticks taken
4	318
4	359
8	970
10	57638

12	6451561

Function Used: g(x) = c * x!
C value = 0.0134689
Asymptotic Error =0.06808%



Based on the data function 7 has a complexity of O(n!).