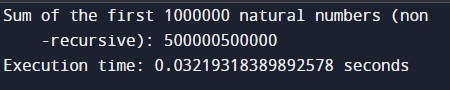
4.Write Programs that demonstrate the mathematical analysis of non-recursive and recursive algorithms.

PROGRAM:

import time def sum\_non\_recursive(n): start\_time = time.time() total = 0 for i in range(1, n+1): total += i

end\_time = time.time() execution\_time = end\_time - start\_time return total, execution\_time

n = 1000000 sum\_non\_rec, time\_non\_rec = sum\_non\_recursive(n) print("Sum of the first", n, "natural numbers (non-recursive):", sum\_non\_rec) print("Execution time:", time\_non\_rec, "seconds")

OUTPUT: 

TIME COMPLEXITY: O(n)