3. Write C program that demonstrates the usage of these notations by analyzing the time complexity of some example algorithms.

PROGRAM:

```
import time

def sum_using_loop(n):
    sum = 0
    for i in range(1, n+1):
        sum += i
    return sum
def sum_using_formula(n):
    return (n * (n + 1)) // 2


def main():
    n = 1000000
    start_loop = time.time()
    sum1 = sum_using_loop(n)
    end_loop = time.time()
    time_taken_loop = end_loop - start_loop
    print("Sum using loop:", sum1)
    print("Time taken using loop:", time_taken_loop, "seconds")
    start_formula = time.time()
    sum2 = sum_using_formula(n)
    end_formula = time.time()
    time_taken_formula = end_formula - start_formula
    print("Sum using formula:", sum2)
    print("Time taken using formula:", time_taken_formula, "seconds")


if __name__ == "__main__":
    main()
```

OUTPUT:

```
Sum using loop: 500000500000
Time taken using loop: 0.07703185081481934
    seconds
Sum using formula: 500000500000
Time taken using formula: 4.0531158447265625e
    -06 seconds
```

TIME COMPLEXITY: O(n)