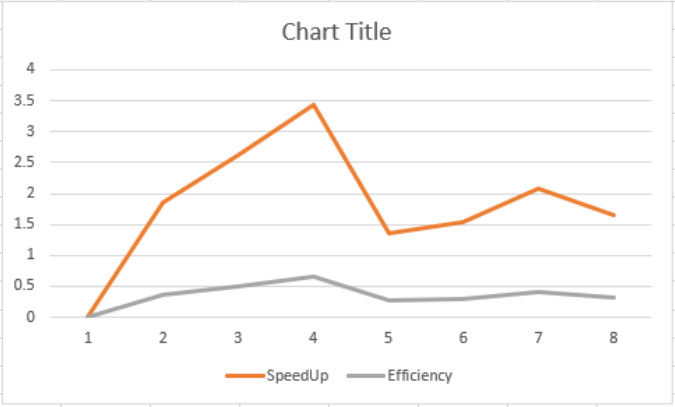
THREADS	EXECUTION TIME (ms)	SpeedUp	Efficiency
1	64744.3459	----------	----------
2	34890.55204	1.855641201	0.356854077
3	24747.67399	2.616179037	0.503111353
4	18883.97908	3.428533024	0.659333274
5	47413.8031	1.365516826	0.26259939
6	41866.49394	1.546447763	0.297393801
7	30973.88816	2.090287973	0.401978456
8	39310.256	1.647009012	0.316732502

Number of physical cores : 4
Hyperthreading factor: 1.3
Hyperthreading: Enabled
M = 4 * 1.3 = 5.2




```
% fork N threads
fork_threads(0, _, _, _, _, _, _, []) :- !.
fork_threads(N, NN, MaxN, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom, [H|T]) :-
    N1 is N-1,
    fork_threads(N1, NN, MaxN, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom, T),
    thread_create(worker(N, NN, MaxN, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom), H, []).

% join N threads
join_threads([]).
join_threads([H|T]) :- thread_join(H, _), join_threads(T).

% fork-join N threads
nt(N, MaxN) :-
    get_time(T0),
    compute_sqrt5(MaxN, Sqrt5Nom, Sqrt5Denom),
    compute_phi(Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom),
    fork_threads(N, N, MaxN, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom, List),
    join_threads(List),
    get_time(T1),
    T is (T1 - T0) * 1000,
    write('Elapsed Time : '),
    write(T),
    nl.

worker(CurrentNumber, NoThreads, MaxN, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom) :-
    CurrentNumber =< MaxN, !,
    compute_fibonacci(CurrentNumber, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom, R),
    assert(fib(CurrentNumber, R)),
    NextNumber is CurrentNumber + NoThreads,
    worker(NextNumber, NoThreads, MaxN, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom).

compute_fibonacci(Number, Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom, R) :-
    PhiBy5Nom is PhiNom ^ Number * Sqrt5Nom,
    PhiBy5Denom is PhiDenom ^ Number * 5 * Sqrt5Denom,

    RNom is 2 * PhiBy5Nom + PhiBy5Denom,
    RDenom is 2 * PhiBy5Denom,
    R is RNom // RDenom.
```

```
compute_sqrt5(MaxN, Sqrt5Nom, Sqrt5Denom) :-
    Precision is 2 * MaxN // 10 + 100,
    Integer is 5 * (10 ^ (2 * Precision)),
    nth_integer_root_and_remainder(2, Integer, Sqrt5Nom, _),
    Sqrt5Denom is 10 ^ Precision.

compute_phi(Sqrt5Nom, Sqrt5Denom, PhiNom, PhiDenom) :-
    PhiNom is Sqrt5Denom + Sqrt5Nom,
    PhiDenom is 2 * Sqrt5Denom.
```

Dovada ca nu am pus rezultate random si doar asa a iesit:

```
2 ?-
nt(1, 3000).
Elapsed Time : 64744.34590339661
true.

3 ?- nt(2, 3000).
Elapsed Time : 34890.552043914795
true.

4 ?- retractall(fib(_,_)).
true.

5 ?- nt(3, 3000).
Elapsed Time : 24747.673988342285
true.

6 ?- retractall(fib(_,_)).
true.

7 ?- nt(4, 3000).
Elapsed Time : 18883.979082107544
true.

8 ?- retractall(fib(_,_)).
true.

9 ?- nt(5, 3000).
Elapsed Time : 47413.80310058594
true.

10 ?- retractall(fib(_,_)).
true.

11 ?- nt(6, 3000).
Elapsed Time : 41866.49394035339
true.

12 ?- retractall(fib(_,_)).
true.

13 ?- nt(7, 3000).
Elapsed Time : 30973.888158798218
true.

14 ?- retractall(fib(_,_)).
true.

15 ?- nt(8, 3000).
Elapsed Time : 39310.256004333496
true.
```