



N-Rainhas com OpenMP

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Solução 1 com OpenMP

- Paralelizar o laço que busca as soluções para cada posição inicial da primeira rainha
- Schedule static

```
#pragma omp parallel for shared(count) private(i) schedule(static)
for(i=0; i<size; i++) {
    int j;
    int* position = (int *) malloc(size * sizeof(int));
    position[0] = i;

    for(j = 1; j < size; j++)
        position[j] = -1;

    int queen_number = 1;
    while(queen_number > 0) {
        if(put_queen(size, queen_number, position)) {
            queen_number++;

            if(queen_number == size) {
                #pragma omp critical
                count += 1;

                position[queen_number-1] = -1;
                queen_number -= 2;
            }
        } else {
            queen_number--;
        }
    }
}
```

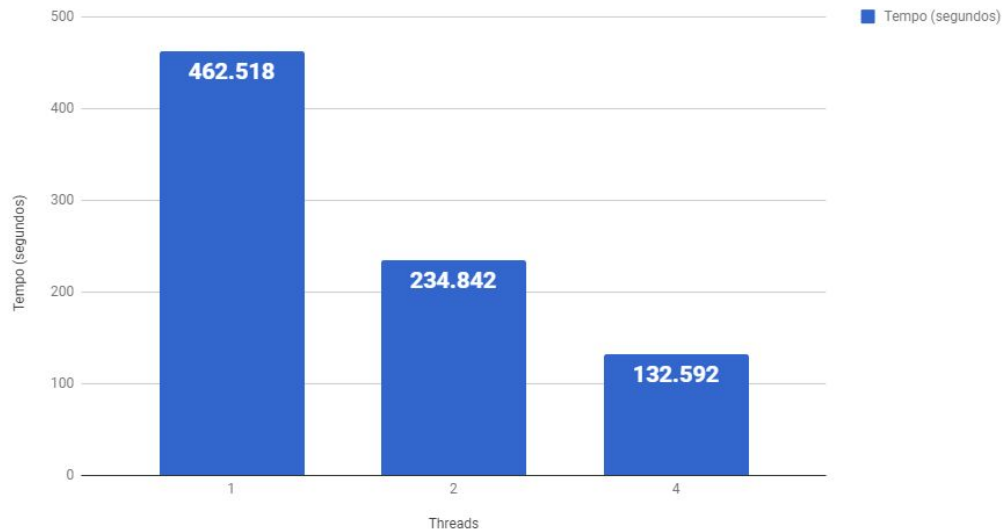


OpenMP - Static

Nº de Rainhas	Threads	Tempo Médio (s)	Speedup
13	1	1.429613	
13	2	0.777832	1.837945726
13	4	0.426228	3.354103907
14	1	9.157798	
14	2	4.640654	1.973385217
14	4	2.924874	3.131005985
15	1	63.4233	
15	2	34.075703	1.861247001
15	4	19.079444	3.324169195
16	1	462.517628	
16	2	234.841772	1.969486195
16	4	132.592442	3.488265402

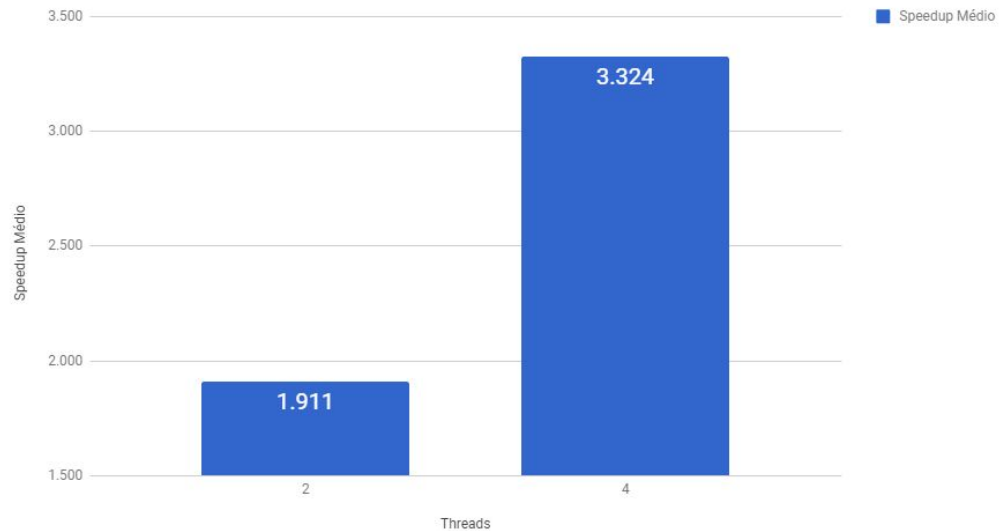
OpenMP - Static

Tempo (segundos) vs. Threads - 16 Rainhas



OpenMP - Static

Speedup Médio vs. Threads



Solução 2 com OpenMP

- Paralelizar o laço que busca as soluções para cada posição inicial da primeira rainha
- Schedule dynamic

```
#pragma omp parallel for shared(count) private(i) schedule(dynamic)
for(i=0; i<size; i++) {
    int j;
    int* position = (int *) malloc(size * sizeof(int));
    position[0] = i;

    for(j = 1; j < size; j++)
        position[j] = -1;

    int queen_number = 1;
    while(queen_number > 0) {
        if(put_queen(size, queen_number, position)) {
            queen_number++;

            if(queen_number == size) {
                #pragma omp critical
                count += 1;

                position[queen_number-1] = -1;
                queen_number -= 2;
            }
        } else {
            queen_number--;
        }
    }
}
```

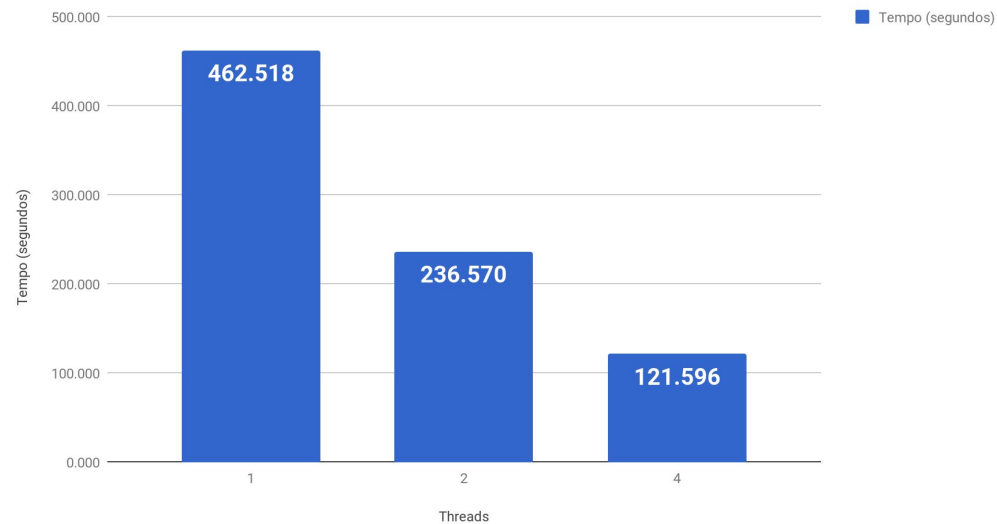


OpenMP - Dynamic

Nº Rainhas	Threads	Tempo Médio (s)	Speedup
13	1	1.429613	
13	2	0.775459	1.843570066
13	4	0.432758	3.303492945
14	1	9.157798	
14	2	4.737892	1.932884498
14	4	2.651163	3.454256868
15	1	63.4233	
15	2	33.820241	1.875305974
15	4	17.526023	3.618807302
16	1	462.517628	
16	2	236.569553	1.955102092
16	4	121.59584	3.803729042

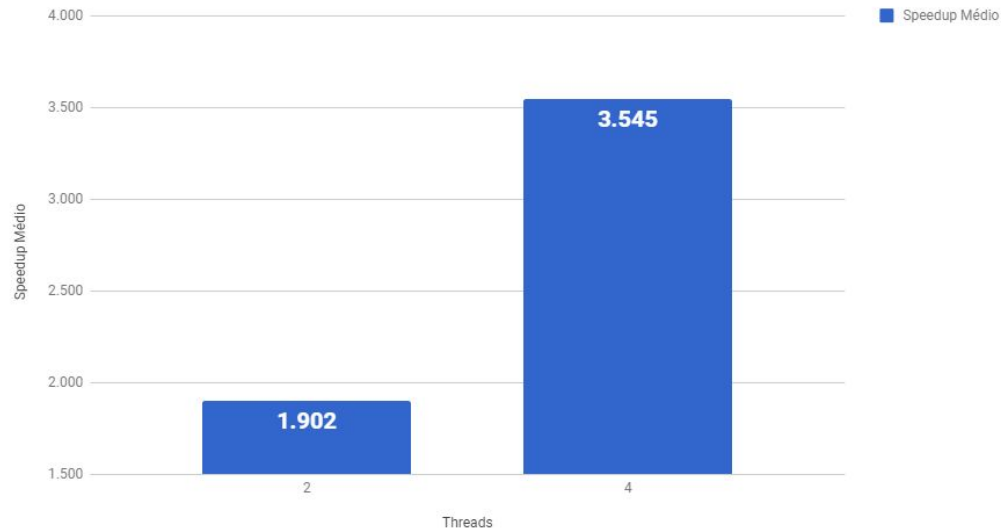
OpenMP - Dynamic

Tempo (segundos) vs. Threads



OpenMP - Dynamic

Speedup Médio vs. Threads



Static vs Dynamic

