

Source Code:

```
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include <math.h>

#define MAX 8
#define true 1
#define false 0

int col[MAX + 1] = {0};
int promising(int i);
int n_queens(int n);

int main(void) {
    int ret = 0, tot = 0;

    srand(time(NULL));

    for(int i = 0; i < 20; i++) {
        ret = n_queens(MAX);
        tot += ret;
        printf("\tseq[%d]: numnodes = %d\n", i, ret);
    }

    printf("\ttot = %d\tavg = %d\n", tot, tot/20);
    return 0;
}

int n_queens(int n) {
    int i = 0, j, m = 1;
    int numnodes = 1, prod = 1;
    int random;

    while(m != 0 && i != n) {
        prod = prod * m;
        numnodes = numnodes + prod * n;
        i++;
```

```

m = 0;
int prom_children[MAX + 1] = {0};
for(j = 1; j <= n; j++) {
    col[i] = j;
    if(promising(i)) {
        m++;
        prom_children[j] = true;
    }
}
if(m != 0) {
    while(1) {
        random = (rand() % MAX) + 1;
        if(prom_children[random] == 1) {
            j = random;
            break;
        }
    }
    col[i] = j;
}
return numnodes;
}

int promising(int i) {
    int k = 1, Switch = true;
    while(k < i && Switch) {
        if(col[i] == col[k] || abs(col[i] - col[k]) == i - k)
            Switch = false;
        k++;
    }
    return Switch;
}

```

Output:

```

harshavaidhyam@Harshas-MacBook-Pro quiz 6 % cd /Users/harshavaidhyam/Desktop/Pitt\
term-1/Algo\ Design/quiz\ 6 ; /usr/bin/env /usr/local/bin/python3 /
Users/harshavaidhyam/.vscode/extensions/c_files /../../debugpy/launcher 52708 --
/Users/harshavaidhyam/Desktop/Pitt\ term-1/Algo\ Design/quiz\ 8/quiz_8.c

```

seq[0]: numnodes = 17513

seq[1]: numnodes = 16633  
seq[2]: numnodes = 26873  
seq[3]: numnodes = 11375  
seq[4]: numnodes = 17035  
seq[5]: numnodes = 19462  
seq[6]: numnodes = 14281  
seq[7]: numnodes = 12750  
seq[8]: numnodes = 11977  
seq[9]: numnodes = 9473  
seq[10]: numnodes = 12873  
seq[11]: numnodes = 21513  
seq[12]: numnodes = 8730  
seq[13]: numnodes = 43913  
seq[14]: numnodes = 21513  
seq[15]: numnodes = 22846  
seq[16]: numnodes = 17737  
seq[17]: numnodes = 18349  
seq[18]: numnodes = 22473  
seq[19]: numnodes = 14640  
total = 361959  
avg = 18098