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Quiz 8

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