**// Program 12: Write and execute a program to find solution to n- queens problem**

**#include<stdio.h>**

**#include<math.h>**

**void main()**

**{**

**int n;**

**clrscr();**

**printf(" Enter the Number of Queens \n");**

**scanf("%d", &n);**

**if(n == 1 || n==2 || n==3)**

**printf(" Solution is not posible \n");**

Enter the Number of Queens

4

Solution 1 is

2 4 1 3

Solution 2 is

3 1 4 2

**else**

**nqueen(n);**

**}**

**// Function for nqueens**

**nqueen(int n)**

**{**

**int x[10],k=1,i,count = 0;**

**x[k]=0;**

**while(k!= 0)**

**{**

**x[k] = x[k] + 1;**

**while( x[k] <= n && place(x,k) == 0)**

**x[k] = x[k] + 1;**

**if(x[k] <= n)**

**{**

**if( k == n)**

**{**

**count++;**

**printf(" \n Solution %d is \n", count);**

**for(i=1;i<=n;i++)**

**// Function for placing Queen**

**place(int x[10], int k)**

**{**

**int i;**

**for( i = 1; i<=k-1; i++)**

**{**

**if(x[k] == x[i]) return 0;**

**if(abs(x[k] -x[i]) == abs(i-k) ) return 0;**

**}**

**return 1;**

**}**

**printf("%d \t", x[i]);**

**}**

**else**

**{**

**k = k + 1;**

**x[k] = 0;**

**}**

**}**

**else**

**k--;**

**}**

**}**

**OR**

#include <stdio.h>

#include <stdlib.h>

#include <math.h>

// Place function to check if it's safe to place a queen

int place(int \*x, int k) {

int i;

for (i = 1; i <= k - 1; i++) {

if (x[k] == x[i]) // Same column

return 0;

if (abs(x[k] - x[i]) == abs(k - i)) // Same diagonal

return 0;

}

return 1;

}

// NQueen function to find all solutions

void nqueen(int n) {

int \*x = (int \*)malloc((n + 1) \* sizeof(int)); // Dynamically allocate memory

int k = 1, i, count = 0;

x[k] = 0;

while (k != 0) {

x[k] = x[k] + 1;

while (x[k] <= n && place(x, k) == 0)

x[k] = x[k] + 1;

if (x[k] <= n) {

if (k == n) {

count++;

printf("\nSolution %d is:\n", count);

for (i = 1; i <= n; i++)

printf("%d\t", x[i]);

printf("\n");

} else {

k = k + 1;

x[k] = 0;

}

} else {

k--;

}

}

free(x); // Free dynamically allocated memory

}

// Main function

int main() {

int n;

printf("Enter the number of queens: ");

scanf("%d", &n);

if (n == 1 || n == 2 || n == 3) {

printf("Solution is not possible for n = %d.\n", n);

} else {

nqueen(n);

}

return 0;

}