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N-Queens Problem

Code

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

int NbSoln(int k, int col[])
{
   int i;
   for(i=1;i<=k-1;i++)
   {
      if(col[k]=col[i] || (abs(i-k)=abs(col[i] - col[k])))
         return 1;
   }
   return 0;
}

int NQueen(int n)
{
   int k =1;
   int count=0;
   int i,j,col[n+1];
   col[k]=0;
   while(k!=0)
   {
      col[k] +=1;
      while(col[k]<=n && NbSoln(k,col))
         col[k]=col[k]+1;
```

```
    if(col[k]<=n)
    {
      if(k==n)
      {
        count++;
        printf("\nSolution - %d : \n",count);
        for(i=1;i<=n;i++)
        {
          for(j=1;j<=n;j++)
            if(col[i] == j)
              printf(" Q%d",i);
            else
              printf(" * ");
          printf("\n\n");
        }
      }
    else
    {
      k++;
      col[k]=0;
    }
  }
  else
    k--;
  }
  return count;
}

int main()
{
  int n,solutions;
```

```
    printf("\tN-Queens Problem");
    printf("\nEnter the number of queens : ");
    scanf("%d",&n);
    solutions=NQueen(n);
    if(solutions==0)
        printf("No solution!!");
    return 0;
}
```

Output

```
        N-Queens Problem
Enter the number of queens : 5

Solution - 1 :
 Q1  *  *  *  *

 *  *  Q2  *  *

 *  *  *  *  Q3

 *  Q4  *  *  *

 *  *  *  Q5  *


Solution - 2 :
 Q1  *  *  *  *

 *  *  *  Q2  *

 *  Q3  *  *  *

 *  *  *  *  Q4

 *  *  Q5  *  *


Solution - 3 :
 *  Q1  *  *  *

 *  *  *  Q2  *

 Q3  *  *  *  *

 *  *  Q4  *  *

 *  *  *  *  Q5


Solution - 4 :
 *  Q1  *  *  *

 *  *  *  *  Q2

 *  *  Q3  *  *

 Q4  *  *  *  *
```

```
Solution - 5 :
 *  *  Q1  *  *

 Q2  *  *  *  *

 *  *  *  Q3  *

 *  Q4  *  *  *

 *  *  *  *  Q5


Solution - 6 :
 *  *  Q1  *  *

 *  *  *  *  Q2

 *  Q3  *  *  *

 *  *  *  Q4  *

 Q5  *  *  *  *


Solution - 7 :
 *  *  *  Q1  *

 Q2  *  *  *  *

 *  *  Q3  *  *

 *  *  *  *  Q4

 *  Q5  *  *  *


Solution - 8 :
 *  *  *  Q1  *

 *  Q2  *  *  *

 *  *  *  *  Q3

 *  *  Q4  *  *

 Q5  *  *  *  *
```

```
Solution - 9 :
 *  *  *  *  Q1

 *  Q2 *  *  *

 *  *  *  Q3 *

 Q4 *  *  *  *

 *  *  Q5 *  *


Solution - 10 :
 *  *  *  *  Q1

 *  *  Q2 *  *

 Q3 *  *  *  *

 *  *  *  Q4 *

 *  Q5 *  *  *


Process returned 0 (0x0)   execution time : 7.902 s
Press any key to continue.
```