```
#include<iostream>
using namespace std;
int grid,dbg;
class node{
    public:
        //static int n;
        int n;
        int **board;
        int curr_row;
        node *next;
        node(){
            //intial
            n=grid;
            next=NULL;
            curr_row=-1;
            board = new int*[n];
            for(int i=0;i<n;i++){
                board[i] = new int[n];
                for(int j=0;j<n;j++)
                    board[i][j] = 0;
            }
        }
        node(node *parent){
            this->n=grid;
            this->curr_row=parent->curr_row+1;
            this->board=new int*[n];
            for(int i=0;i<n;i++){
                this->board[i] = new int[n];
                for(int j=0;j<n;j++)
                    this->board[i][j] = parent->board[i][j];
            }
            this->next=NULL;
        }
        ~node(){
            for(int i=0;i<n;i++)
                delete board[i];
            delete board;
        }
        int place(int col){
            if(curr_row == grid)
                return 0;
            int f=1;
            //left diag
            for(int r=curr_row-1,c=col-1;r>=0 && c>=0;r--,c--){
                if(board[r][c])
                    f=0;
            }
            //right diag
            for(int r=curr_row-1,c=col+1;r>=0 && c<n;r--,c++){
                if(board[r][c])
```

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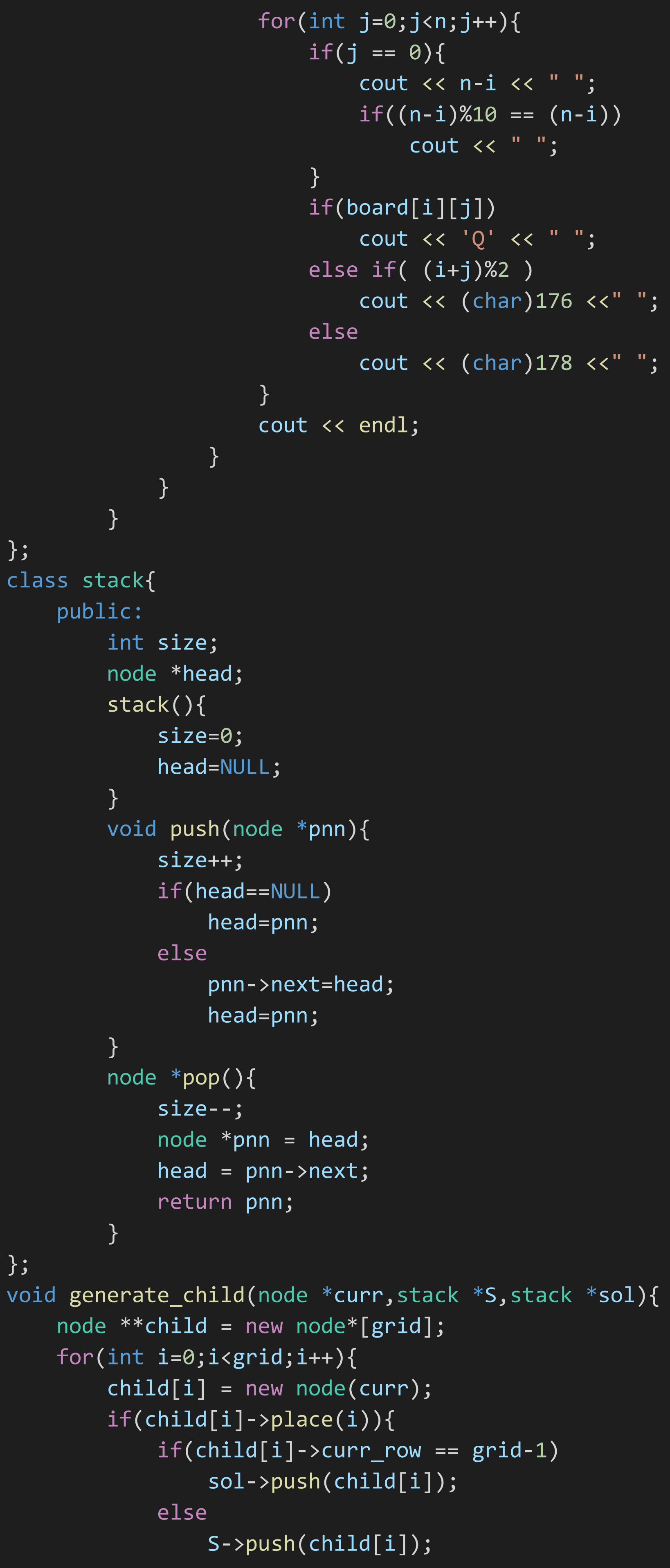
                    f=0;
            }
            //up
            for(int r=curr_row-1;r>=0;r--){
                if(board[r][col])
                    f=0;
            }
            board[curr_row][col]=1;
            return f;
        }
        void attacked(int c){
            int ct=0;
            char c1 = 'a'+c;
            char c2;
            c2 = 'a'+c;
            for(int i=1;curr_row-i>=0;i++){//north
                if(board[curr_row-i][c]){
                    cout << "Q" << c1 << n-curr_row << " attacked by Q" << c2 << (n-
curr_row)+i << endl;
                }
            }
            c2 = 'a'+c;
            for(int i=1;curr_row-i >= 0 && c+i < n;i++){//east-north
                c2++;
                if(board[curr_row-i][c+i]){
                    ct++;
                    cout << "Q" << c1 << n-curr_row << " attacked by Q" << c2 << (n-
curr_row)+i << endl;
                }
            }
            c2 = 'a'+c;
            for(int i=1;curr_row-i >= 0 && c-i >= 0;i++){//west-north
                c2--;
                if(board[curr_row-i][c-i]){
                    ct++;
                    cout << "Q" << c1 << n-curr_row << " attacked by Q" << c2 << (n-
curr_row)+i << endl;
                }
            }
        }
        void print(){
            char file= 'a';
            for(int i=0;i<=n;i++){
                if(i==n){
                    cout << "   ";
                    for(int j=0;j<n;j++){
                        cout << file++ << " ";
                    }
                    cout << endl;
                }else{
```



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                    for(int j=0;j<n;j++){
                        if(j == 0){
                            cout << n-i << " ";
                            if((n-i)%10 == (n-i))
                                cout << " ";
                        }
                        if(board[i][j])
                            cout << 'Q' << " ";
                        else if( (i+j)%2 )
                            cout << (char)176 <<" ";
                        else
                            cout << (char)178 <<" ";
                    }
                    cout << endl;
                }
            }
        }
};
class stack{
    public:
        int size;
        node *head;
        stack(){
            size=0;
            head=NULL;
        }
        void push(node *pnn){
            size++;
            if(head==NULL)
                head=pnn;
            else
                pnn->next=head;
                head=pnn;
        }
        node *pop(){
            size--;
            node *pnn = head;
            head = pnn->next;
            return pnn;
        }
};
void generate_child(node *curr,stack *S,stack *sol){
    node **child = new node*[grid];
    for(int i=0;i<grid;i++){
        child[i] = new node(curr);
        if(child[i]->place(i)){
            if(child[i]->curr_row == grid-1)
                sol->push(child[i]);
            else
                S->push(child[i]);
        }else{
            if(dbg){
                cout << "<<deleted node>>" << endl;
                child[i]->print();
                child[i]->attacked(i);
                cout << "<<<<<<<<>>>>>>>>" << endl;
            }
            delete child[i];
        }
    }
}
void solve(stack *S,stack *sol){
    node *curr,*pnn;
    //intial
    pnn = new node;
    S->push(pnn);
    while(S->head!=NULL){
        curr=S->pop();
        generate_child(curr,S,sol);
        delete curr;
    }
}
int main(){
    stack *S=new stack,*solution=new stack;
    cout << "enter grid size: ";
    cin >> grid;
    cout << "show deleted nodes 1/0 ?: ";
    cin >> dbg;
    // node::n = grid;
    solve(S,solution);
    cout << "<<<<<<< SOLUTION >>>>>>>" << endl;
    node *trav = solution->head;
    while(trav != NULL){
        trav->print();
        cout << endl;
        trav = trav->next;
    }
    cout << solution->size << " solutions !!" << endl;
    cout << "<<<<<<<<<<<<>>>>>>>>>>>>" << endl;
    delete S;
    delete solution;
    return 0;
}
```