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/*
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```
Kuldeep co19336
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Kunal co19337
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Hardik co19324 */
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```
#include<iostream>
```

```
#include<fstream>
```

```
using namespace std;
```

```
void show(int arr[9][9]){
```

```
cout<<"\nTHE SOLUTION OF THIS PUZZLE IS : \n\n";
```

```
for(int i=0;i<9;i++){
```

```
for(int j=0;j<9;j++){
```

```
cout<<arr[i][j]<<" ";
```

```
}cout<<"\n";
```

```
}
```

```
}
```

```
bool check_empty_spaces(int arr[9][9],int l[]){
```

```
for(int i=0;i<9;i++){
```

```
for(int j = 0;j<9;j++){
```

```
if (arr[i][j]==0){
```

```
l[0]=i;
```

```
l[1]=j;
```

```
return true;
```

```
}
```

```
return false;
```

```
}
```

```
bool row_check(int arr[9][9],int num,int xpos){
```

```
for(int i=0;i<9;i++){
```

```
if(arr[xpos][i]==num){
```

```
return false;
```

```
}
```

```
}
```

```
return true;
```

```
}
```

```
bool column_check(int arr[9][9],int num,int ypos){
```

```
for(int i=0;i<9;i++){
```

```
if(arr[i][ypos]==num){
```

```
return false;
```

```
}
```

```
}
```

```
return true;
```

```
}
```

```
bool box_check(int arr[9][9],int num,int xpos, int ypos){
```

```
for(int i=0;i<3;i++){
```

```
for(int j=0;j<3;j++){
```

```
if(arr[i+xpos][j+ypos]==num){  
    return false;  
}  
}  
}  
return true;  
}
```

```
bool overall_check(int arr[9][9],int num,int xpos,int ypos){  
    return  
(row_check(arr,num,xpos)&&column_check(arr,num,ypos)&&box_check(arr,num,xpos-  
xpos%3,ypos-ypos%3));  
}
```

```
bool solve(int arr[9][9]){  
    int xpos,ypos;  
    int l[2] = {0,0};  
    if(!check_empty_spaces(arr,l)){  
        show(arr);  
        return true;  
    }  
    xpos = l[0];  
    ypos = l[1];  
    for(int num=1;num<10;num++){  
        if (overall_check(arr,num,xpos,ypos)){
```

```
arr[xpos][ypos]=num;

if(solve(arr)){

return true;

}

arr[xpos][ypos]=0;

}

}

return false;

}
```

```
bool input_puzzle(char filename[50],int arr[9][9]){

ifstream f(filename);

if(f==NULL){

return false;

}

string str;

for(int i=0;i<9;i++){

getline(f,str);

for(int j=0;j<9;j++){

arr[i][j]=(str[j]-48);

}

}

f.close();

return true;

}
```

```

void puzzle_show(int arr[9][9]){

cout<<"THE GIVEN PUZZLE IS :\n\n";

for(int i=0;i<9;i++){

for(int j=0;j<9;j++)

cout<<arr[i][j]<<" ";

cout<<"\n";

}

}

int main(){

char filename[50];

cout<<"\n\t\t\tSUDOKU PUZZLE SOLVER\n made by
:\n\nKUNAL(CO19337)\nKULDEEP(CO19336)\nHARDIK(CO19324)\n\n\nENTER NAME OF
TEXT FILE WHERE PUZZLE IS PRESENT : ";

cin>>filename;

cout<<"\n\n";

int arr[9][9];

int recovery[9][9] =
{{5,3,0,0,7,0,0,0,0},{6,0,0,1,9,5,0,0,0},{0,9,8,0,0,0,0,6,0},{8,0,0,0,6,0,0,0,3},{4,0,0,8,0,3,0,0,9}};

if(!input_puzzle(filename,arr)){

for(int i=0;i<9;i++)

for(int j=0;j<9;j++)

arr[i][j] = recovery[i][j];

}

puzzle_show(arr);

```

```
if(!(solve(arr))){  
    cout<<"no solution possible";  
}  
}
```