**Sudoku Puzzle**

#include<stdio.h>

void selectpuzzle();

int checkrows();

int checkcolumns();

int checkboxes();

int a[9][9];

void main()

{

int i,j,r,c,f,g,h,m=186,n=205,o=206,x=1,b[9][9];

selectpuzzle();

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

{

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

{

if(a[i][j]==0)

b[i][j]=0;

else

b[i][j]=1;

}

}

while(x==1)

{

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

{

if(i==0)

{

printf(" ");

for(j=1;j<=9;j++)

{

if(j%3==1)

printf(" %d ",j);

else

printf("%d ",j);

}

printf("\n\n");

}

printf("%d ",i+1);

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

{

printf("%d ",a[i][j]);

if(j==2 || j==5)

printf("%c ",m);

}

printf("\n");

if(i==2 || i==5)

{

printf(" ");

for(j=0;j<11;j++)

{

if(j==3 || j==7)

printf("%c%c",o,n);

else

printf("%c%c",n,n);

}

printf("\n");

}

}

for(;;)

{

printf("Enter row number:");

scanf("%d",&r);

printf("Enter column number:");

scanf("%d",&c);

if(r<1 || r>9 || c<1 ||c>9)

{

printf("Invalid choice please enter again.");

continue;

}

r--;

c--;

if(b[r][c]==0)

break;

else

printf("Fixed position. Enter again.\n");

}

for(;;)

{

printf("Enter number from 1 to 9:");

scanf("%d",&a[r][c]);

if(a[r][c]<1 || a[r][c]>9)

printf("Invalid input. Please enter again.");

else

break;

}

printf("Enter 1 to continue solving:");

scanf("%d",&x);

}

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

{

if(i==0)

{

printf(" ");

for(j=1;j<=9;j++)

{

if(j%3==1)

printf(" %d ",j);

else

printf("%d ",j);

}

printf("\n\n");

}

printf("%d ",i+1);

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

{

printf("%d ",a[i][j]);

if(j==2 || j==5)

printf("%c ",m);

}

printf("\n");

if(i==2 || i==5)

{

printf(" ");

for(j=0;j<11;j++)

{

if(j==3 || j==7)

printf("%c%c",o,n);

else

printf("%c%c",n,n);

}

printf("\n");

}

}

f=checkrows();

g=checkcolumns();

h=checkboxes();

if(f==0 || g==0 || h==0)

{

printf("Sudoku incorrectly solved.");

}

else

{

printf("Sudoku correctly solved.");

}

}

void selectpuzzle()

{

int ch,i,j;

int a1[9][9]={{0,1,0,0,0,0,0,0,3},{3,0,0,5,0,4,8,0,0},{0,0,2,0,6,0,0,9,7},{9,0,0,0,3,0,0,4,6},{0,3,7,0,0,2,0,5,0},{8,0,0,7,1,0,0,0,0},{0,4,5,0,7,0,2,0,0},{0,0,0,4,0,8,0,1,0},{0,6,0,0,0,9,3,0,4}};

int a2[9][9]={{7,0,0,9,0,3,4,0,2},{4,0,9,0,0,2,0,0,0},{0,0,8,1,0,0,5,6,0},{0,1,3,0,6,5,8,7,0},{0,8,0,3,0,0,0,9,0},{2,0,0,0,4,0,0,0,3},{6,4,0,0,3,0,0,2,0},{0,0,0,7,9,8,0,0,5},{0,9,5,0,0,0,3,1,0}};

int a3[9][9]={{0,0,3,0,5,0,4,0,0},{2,0,0,8,0,9,6,5,0},{0,0,1,7,0,0,0,0,3},{8,0,9,4,0,0,0,3,0},{0,0,0,6,0,5,1,0,0},{7,0,6,0,1,0,0,0,2},{0,4,0,0,0,2,0,0,0},{0,6,5,1,0,0,8,0,9},{9,0,0,0,0,3,7,0,0}};

for(;;)

{

printf("Enter 1, 2 or 3 to select respective puzzle:");

scanf("%d",&ch);

if(ch<=3 && ch>=1)

break;

else

printf("Invalid choice.");

}

switch(ch)

{

case 1:

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

{

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

{

a[i][j]=a1[i][j];

}

}

break;

case 2:

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

{

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

{

a[i][j]=a2[i][j];

}

}

break;

case 3:

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

{

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

{

a[i][j]=a3[i][j];

}

}

break;

}

}

int checkrows()

{

int i,j,k,x;

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

{

for(j=1;j<=9;j++)

{

x=0;

for(k=0;k<9;k++)

{

if(a[i][k]==j)

x++;

}

if(x!=1)

return 0;

}

}

return 1;

}

int checkcolumns()

{

int i,j,k,x;

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

{

for(j=1;j<=9;j++)

{

x=0;

for(k=0;k<9;k++)

{

if(a[k][i]==j)

x++;

}

if(x!=1)

return 0;

}

}

return 1;

}

int checkboxes()

{

int i,j,k,l,m,x;

for(i=0;i<9;i+=3)

{

for(j=0;j<9;j+=3)

{

for(k=1;k<=9;k++)

{

x=0;

for(l=i;l<i+3;l++)

{

for(m=j;m<j+3;m++)

{

if(a[l][m]==k)

x++;

}

}

if(x!=1)

return 0;

}

}

}

return 1;

}