**Tutorial – 03**

**Implement C program for 8 Puzzle problem.**

|  |  |  |
| --- | --- | --- |
| **Code:** | | #include<stdio.h>  #include<string.h>  #include<unistd.h>  #include<sys/types.h>  #include <sys/stat.h>  #include <stdlib.h>  #include<time.h>  #define r 3  #define c 3  char matrix[r][c];  char new[r][c];  int count;  char final[r][c] = {{'1','2','3'},{'4','5','6'},{'7','8',' '}};  int i,j;  char z ;  int p,q,x,y;  int t =0;  int result = 0;  void load()  {  for(i=0;i<3;i++)  {  for(j=0;j<3;j++)  {  if(new[i][j] == '0')  {  matrix[i][j]= ' ';  continue;  }  matrix[i][j]= new[i][j];  }  }  }  void blank()  {  for(i=0;i<3;i++)  {  for(j=0;j<3;j++)  {  new[i][j]= ' ';  }  }  }  int main()  {  time\_t T= time(NULL);  struct tm tm = \*localtime(&T);  char f[4];  int rsl ;  int random,t;  int randvalues[9];    main:  count = 0;  blank();    T= time(NULL);  tm = \*localtime(&T);  srand(tm.tm\_sec);    while(count!=9)  {  rsl=rand()%9;  sprintf(f,"%d",rsl);  for(i=0;i<r;i++)  {  for(j=0;j<c;j++)  {  if((new[i][j]) == f[0])  {  i = 4; j = 4;  continue;  }  else if((new[i][j]) == ' ')  {  new[i][j] = f[0];  i = 4; j = 4;  count++;  }  }  }  }  load();  for(i=0;i<r;i++)  {  for(j=0;j<c;j++)  {  printf("|%c|",matrix[i][j]);  }  printf("\n");  }  while(1)  {  printf("enter value to change its position to blank space\n");  scanf(" %c",&z);  if(z=='q')  {  printf("\n\*\*\*\*\*You Quit\*\*\*\*\*\n");  goto main;  // break;  }    for(i=0;i<r;i++)  {  for(j=0;j<c;j++)  {  if((matrix[i][j])== z)  {  p = i;  q = j;  }  else if((matrix[i][j])== ' ')  {  x = i;  y = j;  }  }  }  t =0;  int m , n ;  m = p - 1;  n = q ;    if(m>=0)  {  if((matrix[m][n])== ' ')t=1;  }    m = p + 1;    if(m<=2)  {  if((matrix[m][n])== ' ')t=1;  }  m = p;  n = q - 1 ;    if(n>=0)  {  if((matrix[m][n])== ' ')t=1;  }    n = q + 1 ;    if(n<=2)  {  if((matrix[m][n])== ' ')t=1;  }    if(t==1)  {  matrix[x][y] = z;  matrix[p][q] = ' ';  }    t = 0;    for(i=0;i<r;i++)  {  for(j=0;j<c;j++)  {  if((matrix[i][j])== final[i][j])  {  t++;  }  }  }  system("clear");    for(i=0;i<r;i++)  {  for(j=0;j<c;j++)  {  printf("|%c|",matrix[i][j]);  }  printf("\n");  }    if(t==9)  {  printf("\n\*\*\*\*you Win\*\*\*\*\n");  break;  }    }  return 1;  } |
| **Output:** |  | |