Expt. No. **3** **Run Length Encoding for Binary Image**

**Program:**

#include<stdio.h>

#include<iostream.h>

#include<conio.h>

#include<math.h>

#define MAX 10

#define MIN 3

char d[10][10];

int rln[100];

int no\_of\_zero,no\_of\_ones;

int i,j,col,row;

int count=0,flag=0;

//Display title of the program

void header()

{

clrscr();

printf("\n\n\t\tRUNLENGTH ENCODING OF BINARY IMAGE\n");

printf("\t\t=================================");

}

void input()

{

char c;

do{

header();

gotoxy(6,6);

printf("Enter the size of the image :(min=3x3 max=10x10");

gotoxy(6,8);

printf("rows=");scanf("%d",&row);

gotoxy(25,8);

printf("column=");scanf("%d",&col);

}

while(col>MAX||col<MIN||row>MAX||row<MIN);

gotoxy(6,10);

printf("Enter the Bitmap Image;(i.e 0 or 1");

gotoxy(6,12);

printf("Binary Code:");

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

for(i=1;i<=col;i++)

{

d[i][j]=getch();

gotoxy(2\*i+20,j+11);

if((d[i][j]!='1')&&(d[i][j]!='0')){i=i-1;}

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

}

printf("\n\n\tPress any key to continue....");

getch();

}

void initialise()

{

rln[0]=0;

count=1;

if(d[1][1]=='0')flag=1;else flag=0;

no\_of\_zero=0;no\_of\_ones=0;

rln[0]=d[1][1]-48;//converting from char->integer

}

void encode()

{

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

for(i=1;i<=col;i++)

{

if(d[i][j]=='0')

{

if(flag==0)

{

rln[count]=no\_of\_ones;

count++;

flag=1;

no\_of\_zero=0;

}

no\_of\_zero=no\_of\_zero+1;

}

if(d[i][j]=='1')

{

if(flag==1)

{

rln[count]=no\_of\_zero;

count++;

flag=0;

no\_of\_ones=0;

}

no\_of\_ones=no\_of\_ones+1;

}

}

if(flag==0)rln[count]=no\_of\_ones;

else rln[count]=no\_of\_zero;

}

void display()

{

header();

gotoxy(10,6);

printf("Runlength Code:");

gotoxy(10,8);

printf("Tau={");

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

{

printf("%d",rln[i]);

if(i!=count)printf(",");

}

printf("}");

gotoxy(10,10);

printf("Storage of packed binary image:%d bytes",col\*row/8);

gotoxy(10,12);

printf("Storage of unpacked binary image:%d bytes",col\*row);

gotoxy(10,14);

printf("Storage of encoded image:%d bytes",count+1);

printf("\n\n\t Press any key to continue....");

getch();

}

void main()

{

input();

initialise();

encode();

display();

}

Output:

