Name: Vishisth basnet
Roll no:40
Course: Bsc.IT(6th sem)

Write a program for implementing Bresenhams line algorithm for m<1
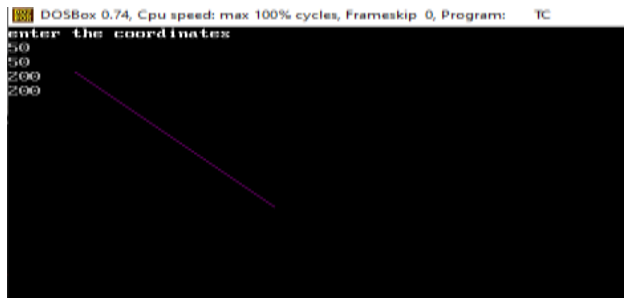
```c
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
void main()
{
int gd=DETECT,gm;
clrscr();
int x1,y1,x2,y2,p,k,dx,dy,x,y;
printf("enter the coordinates\n");
scanf("%d%d%d%d",&x1,&y1,&x2,&y2);
dx=x2-x1;
dy=y2-y1;
p=2*dy-dx;
x=x1;
y=y1;
putpixel(x,y,5);
for(k=0;k<dx;k++)
{
if(p<0)
{
p=p+2*dy;
x++;
}
else
{
p=p+2*dy-2*dx;
x++;
y++;
}
putpixel(x,y,5);
}
getch();
closegraph();
}
```
OUTPUT

Write a program for implementing   mid point circle generation

```c
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
#include<math.h>
void plot(float x,float y)
{
putpixel(x+100,y+100,4);
putpixel(x+100,-y+100,4);
putpixel(-x+100,y+100,4);
putpixel(-x+100,-y+100,4);
putpixel(y+100,x+100,4);
putpixel(-y+100,x+100,4);
putpixel(y+100,-x+100,4);
putpixel(-y+100,-x+100,4);
}
void main()
{
int gd=DETECT,gm;
float x,y,p,x1,y1,x2,y2,r;
clrscr();
initgraph(&gd,&gm,"c:\\turboc3\\bgi");
printf("enter the radius");
scanf("%f",&r);
x=0;
y=r;
plot(x,y);
p=(5/4)-r;
while(x<=y)
{
if(p<0)
{
x++;
p=p+2*x+1;
}
else
{
x++;
y--;
p=p+2*x-2*y+1;
}
plot(x,y);
}
getch();
```

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}
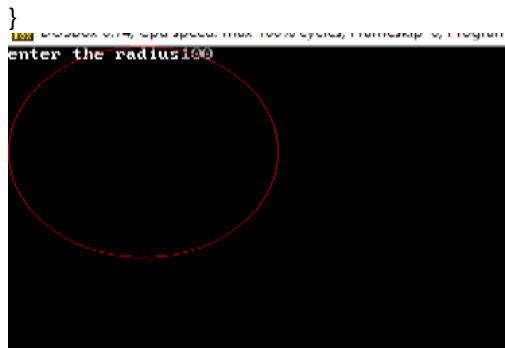
Write a program for implementing DDA line algorithm .
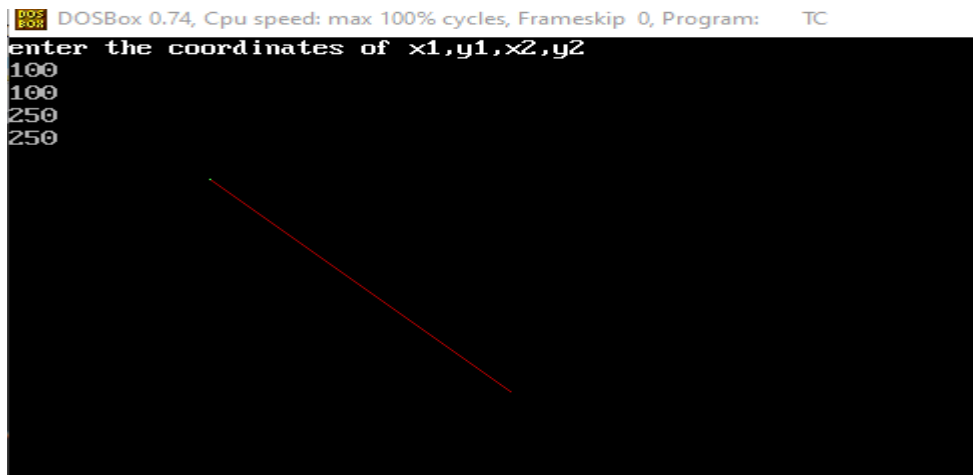
```c
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
void main()
{
int x1,y1,x2,y2,dx,dy,length,i;
float x,y,xinc,yinc;
int gd=DETECT,gm;
initgraph(&gd,&gm,"c:\\turboc3\\bgi");
printf("enter the coordinates of x1,y1,x2,y2");
scanf("%d%d%d%d",&x1,&y1,&x2,&y2);
dx=x2-x1;
dy=y2-y1;
if(abs(dx)>abs(dy))
length=abs(dx);
else
length=abs(dy);
xinc=dx/(float)length;
yinc=dy/(float)length;
x=x1;
y=y1;
putpixel(x,y,10);
for(i=0;i<length;i++)
{
putpixel(x,y,10);
x=x+xinc;
y=y+yinc;
}
getch();
}
OUTPUT
```

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```
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip  0, Program:     TC
enter the coordinates of x1,y1,x2,y2
100
100
250
250
```

Write a program for implementing DDA circle algorithm .

```c
#include<stdio.h>

#include<conio.h>
#include<graphics.h>
#include<math.h>
void main()
{float stx,sty,y1,x1,,y2,x2,ep;
int gd=DETECT,gm,errorcode,tmp,i=1,r;
initgraph(&gd,&gm,"c:\\turboc3\\bgi");
printf("enter the radius\n");
scanf("%d",&r);
while(r>pow(2,i))
{i++;
}
ep=1/pow(2,i);
x1=r;y1=0;
stx=r;sty=0;
do{ssss
x2=x1+(y1*ep);
y2=y1-(x2*ep);
putpixel(x2+200,y2+200,10);
x1=x2;
y1=y2;
}while((y1-sty)<ep||(stx-x1)>ep);
getch();
}
```
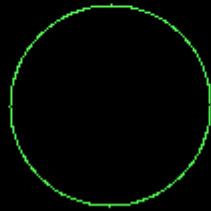
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DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program:
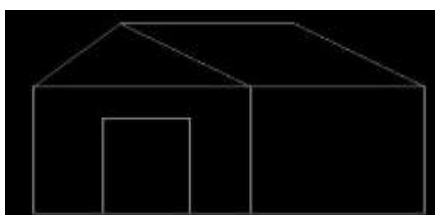
enter the radius
50

Write a program to draw a hut shape using line and rectangle function.

```
#include <stdio.h>
#include <conio.h>
#include <graphics.h>
void main(){
clrscr();
int gdrive = DETECT, gmode;
int a=100,b=200,c=300,d=400,e=500,g=700;
initgraph(&gdrive, &gmode, "C:\\TURBOC3\\BGI");
rectangle(a,c,d,e);
rectangle(d,c,g,e);
rectangle(b,d,c,e);
line(a,c,b,a);
line(b,a,d,c);
line(b,a,e,a);
line(e,a,g,c);
getch();
}
```

Output

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Write a program to implement Bresenhams circle algorithm.

```
#include <stdio.h>
#include <conio.h>
#include <graphics.h>
#include <math.h>

void plot(int xc, int yc, int x, int y){
putpixel(xc+x, yc+y, 4);
putpixel(xc-x, yc+y, 4);
putpixel(xc+x, yc-y, 4);
putpixel(xc-x, yc-y, 4);
putpixel(xc+y, yc+x, 4);
putpixel(xc-y, yc+x, 4);
putpixel(xc+y, yc-x, 4);
putpixel(xc-y, yc-x, 4);
}

void main(){
int gd=DETECT,gm;
int xc,yc,x,y,r,d;
clrscr();
initgraph(&gd,&gm,"C:\\TURBOC3\\BGI");
printf("Enter radius:\n");
scanf("%d",&r);
printf("Enter the coordintes(xc,yc):\n");
scanf("%d%d",&xc,&yc);
x=0;
y=r;
plot(xc,yc,x,y);
d=3-(2*r);
while(y>=x){
x++;
if(d<0){
d=d+(4*x)+6;
}else{
y--;
d=d+4*(x-y)+10;
}
plot(xc,yc,x,y);
}
getch();
}
```

output
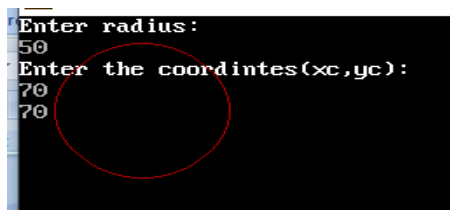
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Write a program to perform the 2D reflection about y-axis of a 2D triangle object.

(consider the center point of screen as centered (Xc, Yc)) (jisna kiya ho vo muja bhi bhej da)

Write a program to perform the 2D rotation of a 2D triangle object.

```c
#include<stdio.h>
#include<graphics.h>
#include<math.h>
main()
{
    intgd=0,gm,x1,y1,x2,y2,x3,y3;
    double s,c, angle;
    initgraph(&gd, &gm, "C:\\TURBOC3\\BGI");
    setcolor(RED);
    printf("Enter coordinates of triangle: ");
    scanf("%d%d%d%d%d%d",&x1,&y1,&x2,&y2, &x3, &y3);
    setbkcolor(WHITE);
    cleardevice();
    line(x1,y1,x2,y2);
    line(x2,y2, x3,y3);
    line(x3, y3, x1, y1);
    getch();
    setbkcolor(BLACK);
    printf("Enter rotation angle: ");
    scanf("%lf", &angle);
    setbkcolor(WHITE);
    c = cos(angle *M_PI/180);
    s = sin(angle *M_PI/180);
    x1 = floor(x1 * c + y1 * s);
    y1 = floor(-x1 * s + y1 * c);
    x2 = floor(x2 * c + y2 * s);
    y2 = floor(-x2 * s + y2 * c);
    x3 = floor(x3 * c + y3 * s);
    y3 = floor(-x3 * s + y3 * c);
    cleardevice();
    line(x1, y1 ,x2, y2);
    line(x2,y2, x3,y3);
    line(x3, y3, x1, y1);
    getch();
    closegraph();
    return 0;
}
```

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WAP to implement the 2D general pivot point rotation on triangle object.

```c
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
#include<math.h>
void main()
{
int gd=DETECT,gm;
clrscr();
initgraph (&gd,&gm,"c:\\tc\\bgi");
float x1,x2,x3,y1,y2,y3,ang,tx,ty;
float op[3][3],ob[3][3],res[3][3],t[3][3],t1[3][3],res1[3][3],res2[3][3];
inti,j,k;
printf("enter x1 and y1 :");
scanf("%f%f",&x1,&y1);
printf("enter x2 and y2 :");
scanf("%f%f",&x2,&y2);
printf("enter x3 and y3 :");
scanf("%f%f",&x3,&y3);
printf("enter tx and ty :");
scanf("%f%f",&tx,&ty);
printf("enter angle :");
scanf("%f",&ang);

ob[0][0]=x1;ob[0][1]=x2;ob[0][2]=x3;
ob[1][0]=y1;ob[1][1]=y2;ob[1][2]=y3;
ob[2][0]=1;ob[2][1]=1;ob[2][2]=1;
t[0][0]=1;t[0][1]=0;t[0][2]=-tx;
t[1][0]=0;t[1][1]=1;t[1][2]=-ty;
t[2][0]=0;t[2][1]=0;t[2][2]=1;
t1[0][0]=1;t1[0][1]=0;t1[0][2]=tx;
t1[1][0]=0;t1[1][1]=1;t1[1][2]=ty;
t1[2][0]=0;t1[2][1]=0;t1[2][2]=1;
op[0][0]=cos(ang*(3.14/180));
op[0][1]=-sin(ang *(3.14/180));
op[0][2]=0;
op[1][0]=sin(ang *(3.14/180));
op[1][1]=cos(ang*(3.14/180));;
op[1][2]=0;
op[2][0]=0;op[2][1]=0;op[2][2]=1;
line(x1,y1,x2,y2);
line(x2,y2,x3,y3);
line(x3,y3,x1,y1);
```

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```
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
res1[i][j]=0;
for( k=0;k<3;k++)
{
res1[i][j]=res1[i][j] +(op[i][k]* t[k][j]);
}
}
}
for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
res2[i][j]=0;
for( k=0;k<3;k++)
{
res2[i][j]=res2[i][j] +(t1[i][k]* res1[k][j]);
}
}
}

for(i=0;i<3;i++)
{
for(j=0;j<3;j++)
{
res[i][j]=0;
for( k=0;k<3;k++)
{
res[i][j]=res[i][j] +(res2[i][k]* ob[k][j]);
}
}
}
line(res[0][0],res[1][0],res[0][1],res[1][1]);
line(res[0][1],res[1][1],res[0][2],res[1][2]);
line(res[0][2],res[1][2],res[0][0],res[1][0]);
getch();
}
```