



# ARYA College of Engineering (ACE)

Experiment No. ....

Date .....

## DO'S AND DON'TS

### DO'S

1. Student should get the record of previous experiment checked before starting new experiment.
2. Read the manual carefully before starting the experiment.
3. Before switching on power, check system properly.
4. System must be handled carefully.
5. Maintain strict discipline.
6. Keep your phone switch off or in vibration mode.
7. Student should get the experiment allotted for next turn, before leaving the lab.

### DON'TS

1. Do not overcrowd the tables.
2. Do not tamper with equipments.
3. Do not leave the lab without permission from the teacher.
4. Do not touch or attempt to touch the mains power supply wire with bare hands.



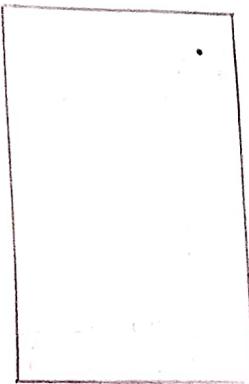
# ARYA College of Engineering (ACE)

Experiment No. 1.....

Date 12 September, 202

Aim :- To produce a single pixel on screen.

Output :-



```
#include <graphics.h>
#include <conio.h>
main()
{
    int gd = DETECT, gm;
    initgraph(&gd, &gm, "C:\TURBOC\BGI");
    putpixel(25,25, RED);
    getch();
    closegraph();
    return 0;
}
```



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Experiment No. ....1.....

Date 12.9.2021

## VIVA - VOICE

Ques. What is Pixel?

Ans. A pixel is one of the small dots or squares that make up an image on a computer screen.

Ques. What is bit plane?

Ans. The memory in a graphic display device which holds a complete one-bit-per-pixel image.

Ques. What is the Resolution?

Ans. The number of pixels that are displayed per inch for an image.

Ques. What is aliasing?

Ans. Aliasing is a common problem in computer graphics that occurs when the resolution of the display is not high enough to represent the details of the scene.

Ques. What is anti aliasing?

Ans. Anti-Aliasing is a computer graphics technique that eliminates jagged edges on curves and diagonal lines.



:- Generating Line

## Aim: DDA line algorithm

```
#include <stdio.h>
#include <conio.h>
#include <graphics.h>
#include <ctype.h>
#include <math.h>
#include <stdlib.h>
void draw (int x1, int y1, int x2, int y2);
void main()
{
    int x1, y1, x2, y2;
    int gd, iudec, gmode, jmode;
    initgraph (&gd, &iudec, &gmode, "C:\TURBO C\BIN");
    printf ("\nEnter the x and y value for starting point :\n");
    scanf ("%d%d", &x1, &y1);
    printf ("\nEnter the x and y value for ending point :\n");
    scanf ("%d%d", &x2, &y2);
    printf ("\n The line is shown below :\n");
    draw (x1, y1, x2, y2);
    getch();
}
void draw (int x1, int y1, int x2, int y2)
{
    float x, y, xinc, yinc, dx, dy;
    int K;
    int step;
    dx = x2 - x1;
```



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Experiment No. 2.....

Date 22 September, 2021

```
dy = y2 - y1;
if (abs(dx) > abs(dy))
step = abs(dx);
else
step = abs(dy);
xinc = dx / step;
yinc = dy / step;
x = x1;
y = y1;
putpixel(x,y,1);
for (k=1 ; k<=step ; k++)
{
x = x + xinc;
y = y + yinc;
putpixel(x,y,2);
}
```



# ARYA College of Engineering (ACE)

Experiment No. 2.....

Date 22. September, 2021

## VIVA - VOC

Ques 1. Define point clipping.

Ans. Point clipping is a fundamental algorithm used in computer graphics to determine whether a point lies inside or outside a specific region or boundary.

Ques 2. What is the difference between Raster scan and Random scan?

Ans. Random Scan

Raster Scan

- It has high resolution. → Its resolution is low.
- It is more expensive. → It is less expensive.
- Any modification if needed → Modification is tough
- is easy.
- Solid pattern is easy to fill.

Ques 3. What are the types of Clipping?

Ans. Line clipping, point clipping, Text clipping, Area clipping, Exterior clipping and curve clipping.

2021/17/26 15:09

Ques 4. What do you mean by 'jaggies'?

Ans. It is a term for various kinds of anomalies in computer graphics outputs or display imaging.



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Experiment No. 2.....

Date 23 September, 2023

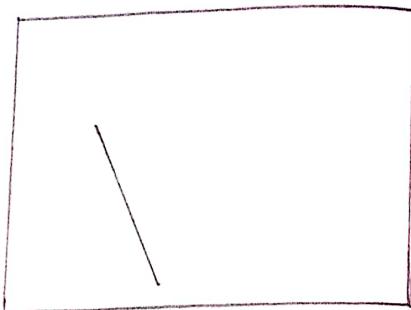
- i.e. Name the two methods by which an electron beam can be bent ?
- Ans. Beams of electrons can be deflected in an electric field (in parabolas).  
Beams of electrons can be deflected in magnetic field (in circles). *From*

2023/11/23 15:00

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Output :- The Program draws a line from (100,100) to (200,200)



:- Line Generation

Aim: Bresenham's line Algorithm

```
#include < stdio.h >
#include < conio.h >
#include < graphics.h >
void main ()
{
    int gd = DETECT, gm;
    int dx, dy, p, end;
    float x1, x2, y1, y2, x, y;
    initgraph (&gd, &gm, "C:\\TURBOC3\\BGI");
    printf ("Enter Value of X1:");
    scanf ("%f", &x1);
    printf ("Enter Value of Y1:");
    scanf ("%f", &y1);
    printf ("Enter Value of X2:");
    scanf ("%f", &x2);
    printf ("Enter Value of Y2:");
    scanf ("%f", &y2);
    dx = abs (x1 - x2);
    dy = abs (y1 - y2);
    p = 2 * dy - dx;
    if (x1 > x2)
    {
        x = x2;
        y = y2;
        end = x1;
    }
```



# ARYA College of Engineering (ACE)

Experiment No. 3.....

Date 30 September 2022

```
else {  
    xc = x1;  
    y = y1;  
    end = xc2; }  
    putpixel (xc,y,10);  
    while (xc < end) {  
        xc = xc + 1;  
        if (p < 0) {  
            p = p + 2 * dy; }  
        else {  
            y = y + 1;  
            p = p + 2 * (dy - dx); }  
            putpixel (xc,y,10); }  
            etch();  
            closegraph(); }  
} Arrow
```



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Experiment No. 3.....

Date 30 September, 2023

## VIVA - VOCE

Ques. 1. What are the advantages of Bresenham's Algorithm?

Ans. Advantages Of Bresenham's Algorithm are :-

- It is easy to implement.
- It is fast and incremental.
- The points generated by this algorithm are more accurate than DDA Algorithm.
- It uses fixed points only.

Ques. 2. List out the various text clipping?

Ans. Three method of Text clipping :- All or none string clipping all or none character clipping and Text clipping.

Ques. What is Transformation?

Ans. Transformation refers to modifying the position, orientation or size of objects within a graphical scene.

Ques. What is fixed scaling?

Ans. It is a way to represent both integers and non-integers using fixed point data types.

Ques. What is covering (Exterior clipping)?

Ans. A subgraph that contains all the vertices or



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all the edges of another graph or all the edges corresponding to some other graph.



# ARYA College of Engineering (ACE)

Experiment No. 4

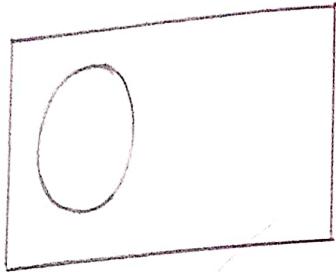
Date 9 October 2023

Aim :- Write a program to implement midpoint circle algorithm.

```
#include <stdio.h>
#include <conio.h>
#include <graphics.h>
void main()
{
    int gd = DETECT, gm;
    int x, y, r;
    void Drawcircle (int, int, int);
    printf("Enter the Mid points and Radius:");
    scanf("%d %d %d", &x, &y, &r);
    initgraph(&gd, &gm, "");
    Drawcircle(x, y, r);
    getch();
    closegraph();
}
```

```
void Drawcircle (int x1, int y1, int r)
{
    int x=0, y=r, p=1-x;
    void cliplot (int, int, int, int);
    cliplot (x1, y1, x, y);
    while (x<y)
    {
        x++;
        if (p<0)
            p+=2*x+1;
        else
```

Output :-





# ARYA College of Engineering (ACE)

Experiment No. 4.....

Date 9.October, 2023

```
y--;
p+=2*(x-y)+1;
clipot(x1,y1,x,y);
}
void clipot(int xctr,int yctr,int xc,int yc)
{
putpixel(xctr+xc,yctr+y,1);
putpixel(xctr-xc,yctr+y,1);
putpixel(xctr+xc,yctr-y,1);
putpixel(xctr-xc,yctr-y,1);
putpixel(xctr+y,yctr+xc,1);
putpixel(xctr-y,yctr+xc,1);
putpixel(xctr+y,yctr-xc,1);
putpixel(xctr-y,yctr-xc,1);
getch();
}
```



# ARYA College of Engineering (ACE)

Experiment No. 4.....

Date 9 October, 2023

## Viva-Voce

Ques1. Define circle?

Ans: It is a set of points that are all the same distance from a common point, called the center.

Ques2. What is the Rotation?

Ans: Rotation in computer graphics is a process of changing the angle of an object.

Ques3. What is Back face removal?

Ans: It is an object space algorithm in computer graphics that removes faces on the back of an object.

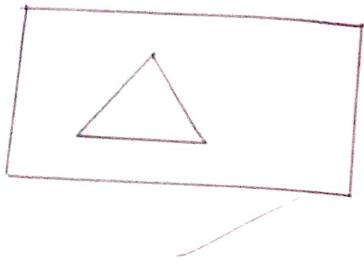
Ques4. What is the use of buffer method?

Ans: It resolves visibility among an arbitrary collection of opaque, transparent, and intersecting objects.

Ques5. What is IMAGE-SPACE Method?

Ans: It is a pixel-based algorithm that is used in the screen coordinate system used to locate the visible surface instead of a visible line.

Output :-



## ARYA College of Engineering (ACE)

Experiment No. ...5.....

Date 16. October. 2023

Aim:- Program to fill a polygon.

```
#include <graphics.h>
#include <stdlib.h>
#include <stdio.h>
#include <conio.h>
int main (void)
{
    int gdriver = DETECT, gmode , errorcode;
    int i, x, y;
    int corner [8];
    initgraph (&gdriver ,&gmode , "C:\\TURBOC3\\BGT");
    errorcode = graphresult ();
    if (errorcode != grOK) {
        printf ("Graphics error : %s\n", graphErrorMsg (errorcode));
        printf ("Press any key to halt : ");
        getch ();
        exit (1);
    }
    x = getmaxx () / 4;
    y = getmaxx () / 4;
    corner [0] = x;
    corner [1] = y;
    corner [2] = x + 200;
    corner [3] = y + 0;
    corner [4] = x + 200;
    corner [5] = y + 150;
```



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Experiment No. ....5.....

Date 16.October, 2023

```
corner[6] = x+0;
corner[7] = y+150;
for(i=EMPTY_FILL; i<USER_FILL; i++) {
    setfillstyle(i, COLOR(random(15)));
    fillpoly(4, corner);
    getch();
    closegraph();
    system(0);
}
```



# ARYA College of Engineering (ACE)

Experiment No. ...5.....

Date 16. October. 2023

## Viva-Voce

Ques.1. Explain diffuse reflection ?

Ans. It occurs when light strikes a surface and is scattered in many directions, giving the impression that the surface is rough.

Ques.2. Explain the Cyrus Beck Line Clipping Algorithm ?

Ans. It is a general algorithm that can be used with a convex polygon clipping window. It allows line clipping for non-rectangular windows

Ques.3. Explain Specular Reflection ?

Ans. Specular reflection is a phenomenon that occurs when light reflects off a smooth, mirror-like surface.

Ques.4. Explain the illumination model ?

Ans. Illumination model is the transport of luminous flux from light source between points via direct and indirect path used to calculate the intensity of light we should see at a given point on the surface of an object.

Ques.5. What is a Spline ?

Ans. A spline is a smooth curve that runs through a series of given points. Splines are defined by a set of control points or vertices.

Arjun  
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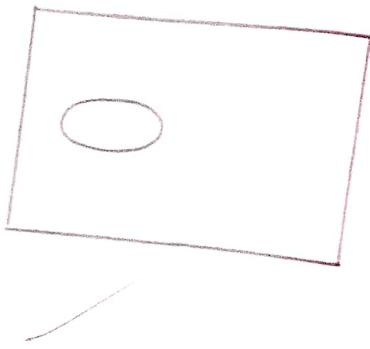


## ARYA College of Engineering (ACE)

Experiment No. ...6.....

Date 30 October, 2023

Output :-



Aim:- Program to fill an ellipse

```
#include <graphics.h>
#include <stdlib.h>
#include <stdio.h>
#include <conio.h>
int main(void)
{
    int gdriver = DETECT, gmode, errorcode;
    int midx, midy, i;
    int xradius = 100, yradius = 50;
    initgraph(&gdriver, &gmode, "C:\\TURBOC3\\BGI");
    errorcode = graphresult();
    if (errorcode != grOK)
    {
        printf("Graphics error: %s\n", graphErrorMsg(errorcode));
        printf("Press any key to halt.");
        getch();
        exit(1);
    }
    midx = getmaxx()/2;
    midy = getmaxy()/2;
    for (i = EMPTY_FILL; i < USER_FILL, i++)
    {
        setfillstyle(i, COLOR1(i));
        ffillellipse(midx, midy, xradius, yradius);
        getch();
    }
    closegraph();
    return 0;
}
```

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# ARYA College of Engineering (ACE)

Experiment No. ....6....

Date 30. October 2023

## Viva-Voce

- i. What is Mid point Ellipse Algorithm?  
The midpoint ellipse algorithm is a method for drawing ellipse in computer graphics.
- ii. Define ellipse?  
The locus of a point is a plane that moves in such a way that the ratio of its distance from fixed point called focus to its distance from fixed straight line called directrix is always constant.
- iii. What is Boundary fill Algorithm?  
It is used to fill a desired color inside a closed polygon with the same boundary color for all of its sides.
- iv. What is flood fill / seed fill Algorithm?  
It is a technique used in computer graphics to fill a connected area in an image or matrix with a particular colour or pattern.
- v. Define ray casting?  
Ray casting is the most basic of many computer graphics rendering alg. that use the geometric alg. of very having used to transform data into a 2-D projection.

Arsh  
4/11/23