1). Write a program to draw **a simple line** using in-built functions in graphics.

Code:-

```
/*write a program to draw a simple line.*/
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
 void main()
{
//printf(" Name:Sunaina \n Roll no.:  33\n");
int gd=DETECT,gm;
initgraph(&gd,&gm,"C:/TURBOC3/BGI");
printf("Name: Sunaina \n Roll No. : 33 \n");
printf("Simple Line Program:");
line(100,200,400,200);
getch();
closegraph();
}
```

Output:-

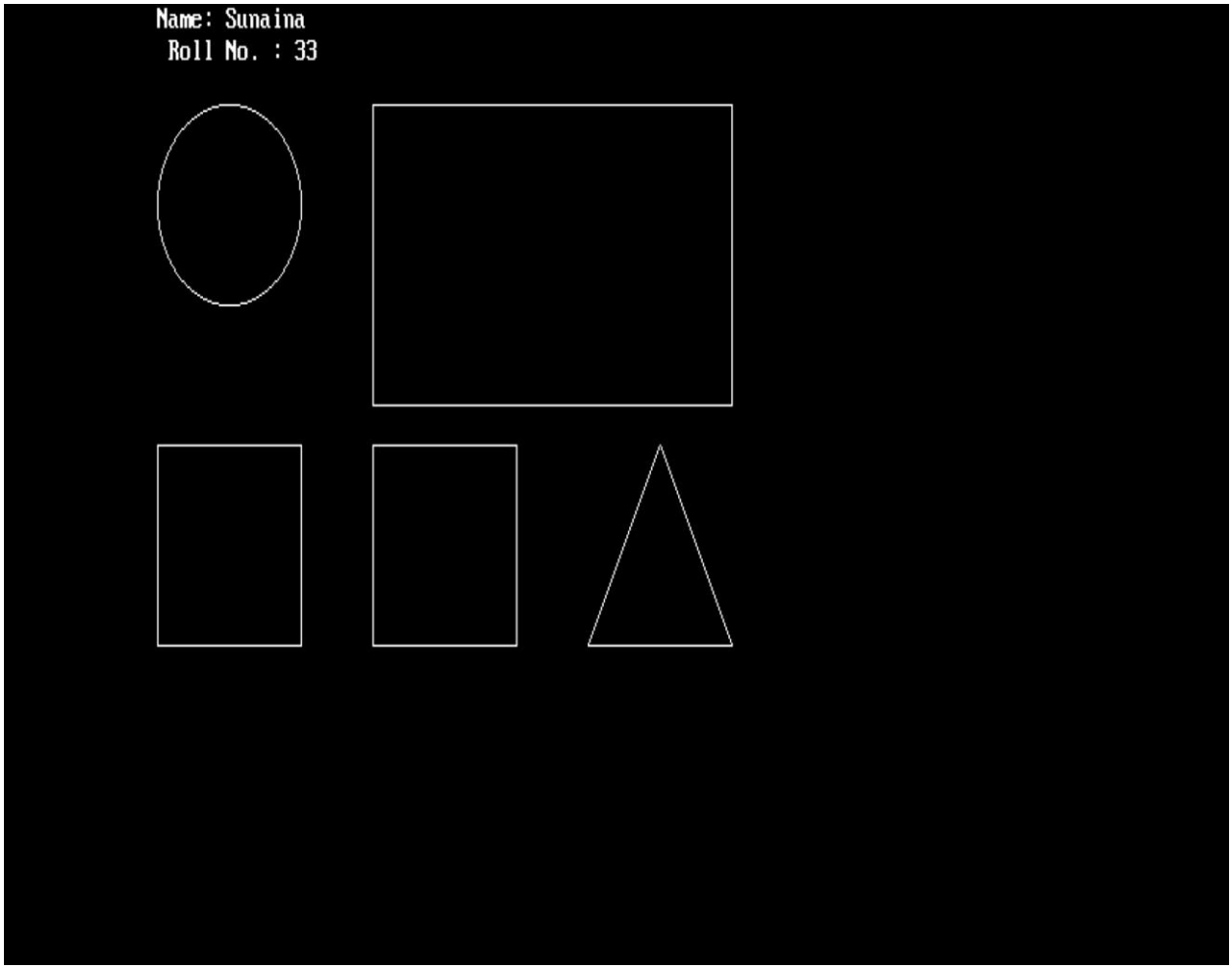
2). Write a program to draw **the shapes like circle, square, rectangle and triangle** in graphics.

Code:-

```
/*Write a program to draw the shapes in graphics*/
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
void main()
{
int gd=DETECT,gm;
initgraph(&gd,&gm,"C://TURBOC3/BGI");
printf("Name: Sunaina \n Roll No. : 33 \n");
// Circle circle(50,100,50);
// Rectangle
rectangle(150,50,400,200);
// Square using rectangle function
rectangle(0,220,100,320);
// Square using line function
line(150,220,250,220);
line(150,220,150,320);
line(250,220,250,320);
line(150,320,250,320);
```

```
// Triangle using line function
line(300,320,350,220);
line(350,220,400,320);
line(300,320,400,320);
getch();
closegraph();
}
```

Output:-



3). Write a program to show the movement of a car in graphics.

Code:-

```
/* Write a program to move a car in graphics*/
#include <graphics.h>
#include <stdio.h>
#include<conio.h>
#include<dos.h>
void draw_moving_car(void) {
        int i=0, j , gd = DETECT, gm;
        initgraph(&gd, &gm, "C://TURBOC3/BGI");
        printf("Name: Sunaina\n Roll No.: 33");
for (i = 0; i <= 420; i = i + 10) {
setcolor(RED);
 line(0 + i, 300, 210 + i, 300);
 line(50 + i, 300, 75 + i, 270);
 line(75 + i, 270, 150 + i, 270);
 line(150 + i, 270, 165 + i, 300);
 line(0 + i, 300, 0 + i, 330);
 line(210 + i, 300, 210 + i, 330);
```

```
circle(65 + i, 330, 15);

circle(65 + i, 330, 2);

circle(145 + i, 330, 15);
circle(145 + i, 330, 2);
line(0 + i, 330, 50 + i, 330);
line(80 + i, 330, 130 + i, 330);
line(210 + i, 330, 160 + i, 330);
 delay(100);
setcolor(BLACK);
line(0 + i, 300, 210 + i, 300);
line(50 + i, 300, 75 + i, 270);
line(75 + i, 270, 150 + i, 270);
line(150 + i, 270, 165 + i, 300);
line(0 + i, 300, 0 + i, 330);
line(210 + i, 300, 210 + i, 330);
circle(65 + i, 330, 15);
circle(65 + i, 330, 2);
circle(145 + i, 330, 15);
circle(145 + i, 330, 2);
line(0 + i, 330, 50 + i, 330);
```

```
line(80 + i, 330, 130 + i, 330);
line(210 + i, 330, 160 + i, 330);
 }
 getch();
 closegraph();
}
// Driver code int
main()
{
draw_moving_car(); return
0;
}
```

Output:-

4). Write a program to draw **colored Hut** in graphics.

Code:

```
/* Write a program to draw the colored hut in graphics*/
#include<graphics.h>
#include<conio.h>
#include<stdio.h>
#include<dos.h>
void main(){
 int gd = DETECT,gm;
initgraph(&gd, &gm, "C://TURBOC3/BGI");
printf(" Name: Sunaina\n Roll No.: 33 \n");
setcolor(WHITE);
rectangle(150,180,250,300);
rectangle(250,180,420,300);
rectangle(180,250,220,300);
line(200,100,150,180);
line(200,100,250,180);
line(200,100,370,100);
line(370,100,420,180);
setfillstyle(SOLID_FILL, BROWN);
floodfill(152, 182, WHITE);
```

```
 floodfill(252, 182, WHITE);
setfillstyle(SLASH_FILL, BLUE);
floodfill(182, 252, WHITE);
setfillstyle(HATCH_FILL, GREEN);
floodfill(200, 105, WHITE);
floodfill(210, 105, WHITE);
getch();
closegraph();
}
```

Output:-

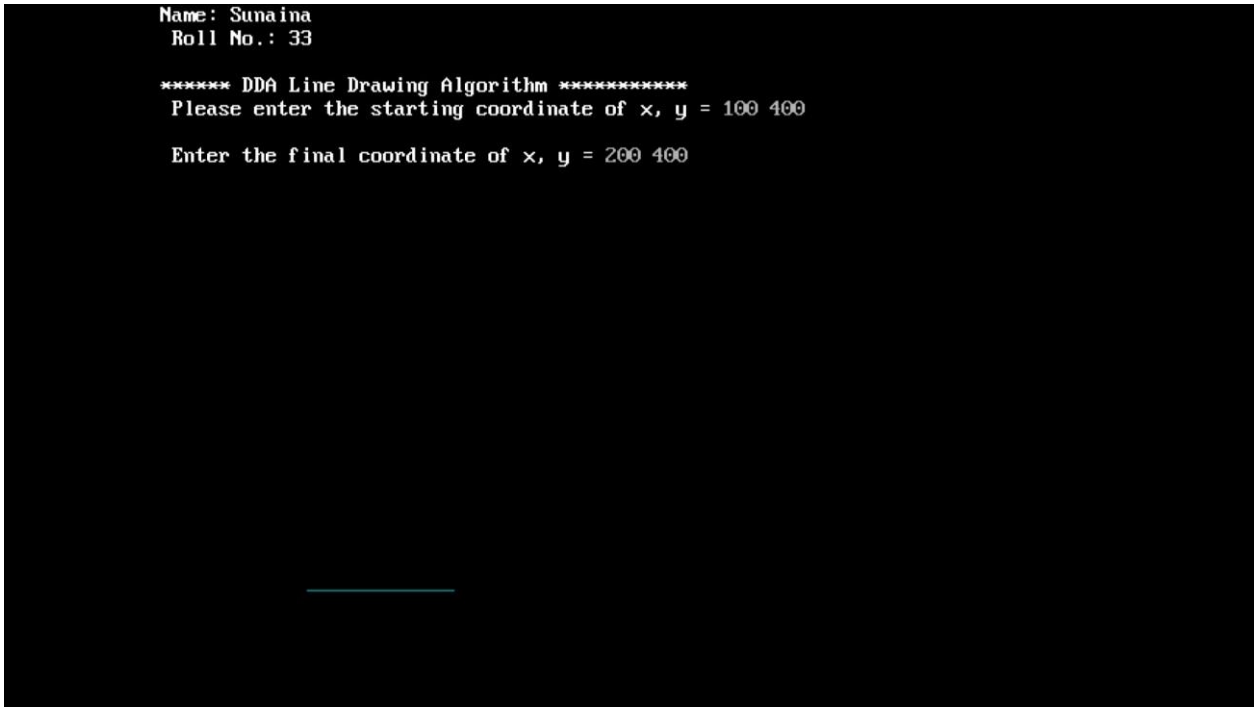
5). Write a program to draw **a line using DDA** in graphics.

Code:-

```
/* Write a program to draw a line using DDA in graphics */
#include<graphics.h>
#include<math.h>
#include<conio.h>
#include<stdio.h>
#include<dos.h>
void main()
{
int x0,y0,x1,y1,i=0;
float delx,dely,len,x,y;
int gd=DETECT,gm;
initgraph(&gd,&gm,"C:\\TURBOC3\\BGI");
 printf("Name: Sunaina \n Roll No.: 33 \n");
printf("\n****** DDA Line Drawing Algorithm
**********");
printf("\n Please enter the starting coordinate of x, y = ");
scanf("%d %d",&x0,&y0);
printf("\n Enter the final coordinate of x, y = ");
scanf("%d %d",&x1,&y1); dely=abs(y1-y0);
```

```
delx=abs(x1-x0);

if(delx<dely)
{
len = dely;
} Else { len=delx;}
delx=(x1-x0)/len;
dely=(y1-y0)/len;
x=x0+0.5;
y=y0+0.5; do{
putpixel(x,y,3);
x=x+delx;
y=y+dely; i++;
}while(i<=len);
getch();
closegraph();
}
```

Output:


Name: Sunaina
Roll No.: 33
****** DDA Line Drawing Algorithm ***********
Please enter the starting coordinate of x, y = 100 400
Enter the final coordinate of x, y = 200 400

6) Write a program to draw **a line using Bresenham's** in graphics.

Code:-

```
/* Write a program to draw a line using bresenham's in graphics */
#include<graphics.h>
#include<conio.h>
#include<stdio.h>
void main()
{
int gd = DETECT ,gm, i;
float x, y,dx,dy,steps;
float x0, x1, y0, y1;
initgraph(&gd,&gm,"C://TURBOC3/BGI");
printf(" Name: Sunaina \n Roll NO. : 33 \n");
printf("Enter the value of x1 and y1 : ");
scanf("%f%f",&x0,&y0);
printf("Enter the value of x2 and y2: ");
scanf("%f%f",&x1,&y1);
dx = (float)(x1 - x0);
dy = (float)(y1 - y0);
if(dx>=dy)
        {
```

```
        steps = dx;}
    else
          {
steps = dy; }
dx = dx/steps;
dy = dy/steps;
x = x0;
y = y0;
i = 1;
 while(i<= steps)
    {
        putpixel(x, y, RED);
x += dx;
y += dy;
i=i+1;
    }
    getch();
closegraph();
}
```

Output:-


Name: Sunaina
Roll NO. : 33
Enter the value of x1 and y1 : 100 400
Enter the value of x2 and y2: 200 400

7) Write a program to **draw circle : using...**

i) mid point .

ii) using bresenham's circle drawing.

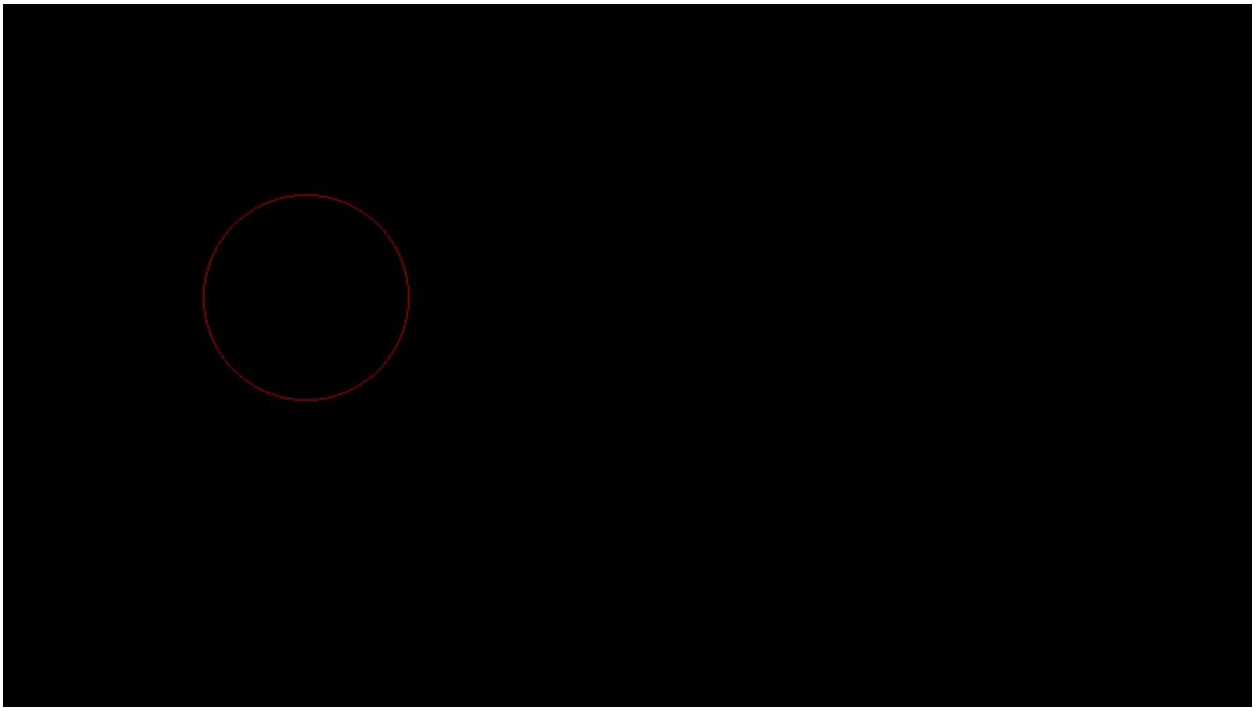
i) Mid point circle Code :

```
/* Write a program to draw a circle using mid point in
graphics */
#include<graphics.h>
#include<conio.h>
#include<stdio.h>
void plotpoints(int x, int y, int cx, int cy){
putpixel(cx + x, cy + y, 4);
putpixel(cx - x, cy + y, 4);
putpixel(cx + x, cy - y, 4);
putpixel(cx - x, cy - y, 4);
putpixel(cx + y, cy + x, 4);
putpixel(cx - y, cy + x, 4);
putpixel(cx + y, cy - x, 4);
putpixel(cx - y, cy - x, 4);
}
void main() {
   int cx, cy, x = 0, y, r, p;
    int gd = DETECT, gm = DETECT;
```

```
        printf("Name: Sunaina \n Roll No.: 33 \n ");
        printf("Enter the center \n");
        scanf("%d%d", &cx, &cy);
        printf("Enter the radius : ");
        scanf("%d", &r);
        y = r;
        p = 1 - r;
        initgraph(&gd, &gm, "C://TURBOC3/BGI");
           cleardevice();
           while (x < y) {
    plotpoints(x, y, cx, cy);
    x++;
    if (p < 0)
              p += 2 * x + 1; else {
    y--;
    p += 2 * (x - y) + 1;
    }
}
 getch();
}
```

Output:-

```
C:\TURBOC3\BIN>TC
Name: Sunaina
 Roll No.: 33
 Enter the center
100
200
Enter the radius : 70_
```



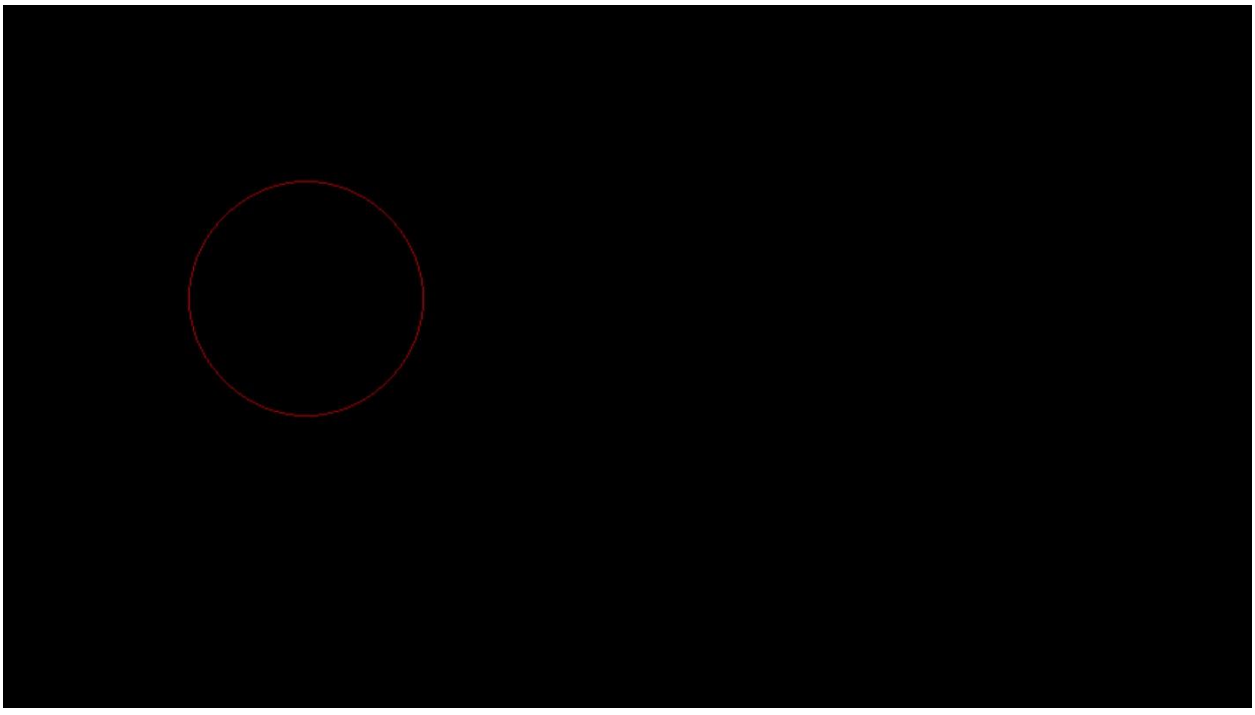
ii) **Using Bresenham's circle** drawing program:

```
/* Write a program to draw a circle using bresenham's
in graphics */
#include <stdio.h>
#include <dos.h>
#include <graphics.h>
#include<conio.h>
void plotPoints(int cx, int cy, int x, int y) {
    putpixel(cx+x, cy+y, RED);
    putpixel(cx-x, cy+y, RED);
    putpixel(cx+x, cy-y, RED);
    putpixel(cx-x, cy-y, RED);
    putpixel(cx+y, cy+x, RED);
    putpixel(cx-y, cy+x, RED);
    putpixel(cx+y, cy-x, RED);
    putpixel(cx-y, cy-x, RED);
}
void main() {
int cx, cy, x = 0, y, r, p;
    int gd = DETECT, gm;
    clrscr();
```

```
    printf("Name : Sunaina \n Roll No.: 33 \n ");
    printf("Enter the coordinates of centre of the circle:
");
    scanf("%d %d", &cx, &cy);
    printf("Enter radius of : ");
    scanf("%d", &r);
   y = r;
   p = 3 - 2 * r;
   initgraph(&gd, &gm, "C://TURBOC3/BGI");
cleardevice();
while (x < y) {
          plotPoints(cx, cy, x, y);
          x++;
          if (p < 0)
            p = p + 4 * x + 6;
             else {
                 y--;
                 p = p + 4 * (x - y) + 10; }
          plotPoints(cx, cy, x, y);
    delay(200); }
getch();
}
```

Output:-

```
Name : Sunaina
 Roll No.: 33
 Enter the coordinates of centre of the circle: 100
200
Enter radius of : 80_
```



8). Write a program to draw **an ellipse using mid-point** in graphics.

Code:

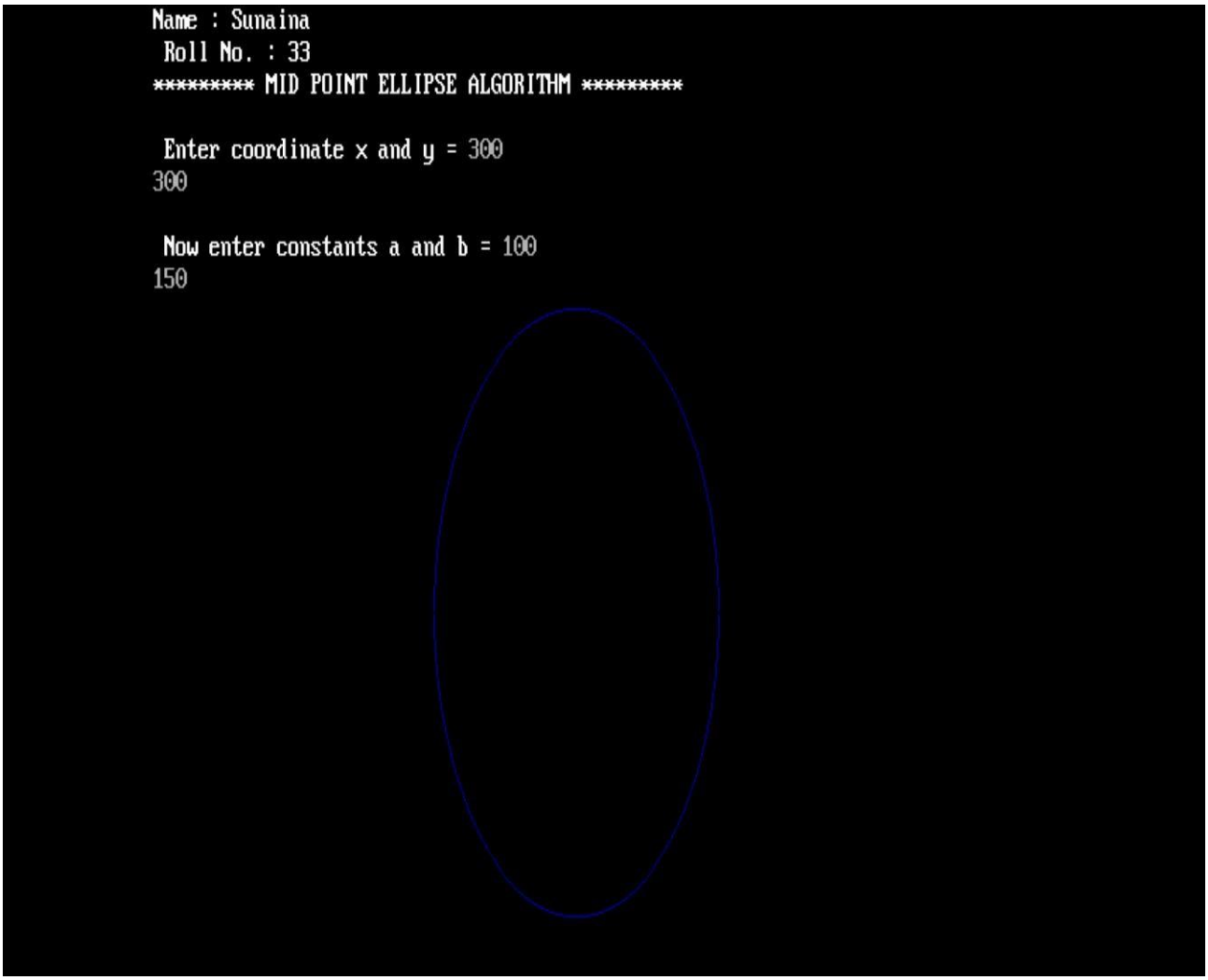
```
/* Write a program to draw an ellipse using mid point in graphics */
#include<stdio.h>
#include<graphics.h>
#include<conio.h>
#include<dos.h>
void main(){
 long x,y,x_center,y_center;
 long a_sqr,b_sqr, fx,fy, d,a,b,tmp1,tmp2;
int gd=DETECT,gm;
clrscr();
initgraph(&gd,&gm,"C://TURBOC3//BGI");
printf("Name : Sunaina \n Roll No. : 33 \n");
printf("********* MID POINT ELLIPSE ALGORITHM
*********");
printf("\n\n Enter coordinate x and y = ");
scanf("%ld%ld",&x_center,&y_center);
printf("\n Now enter constants a and b = ");
scanf("%ld%ld",&a,&b);
   x=0;
```

```
   y=b;
a_sqr=a*a;
b_sqr=b*b;
fx=2*b_sqr*x;
fy=2*a_sqr*y;
d=b_sqr-(a_sqr*b)+(a_sqr*0.25);
do
  {
putpixel(x_center+x,y_center+y,1);
putpixel(x_center-x,y_center-y,1);
putpixel(x_center+x,y_center-y,1);
putpixel(x_center-x,y_center+y,1);

  if(d<0)
   {
 d=d+fx+b_sqr;
   }
  else
 {
 y=y-1;
d=d+fx+-fy+b_sqr;
fy=fy-(2*a_sqr);
```

```
 }
 x=x+1;
fx=fx+(2*b_sqr);
delay(10);

 }
 while(fx<fy);
tmp1=(x+0.5)*(x+0.5);
tmp2=(y-1)*(y-1);
d=b_sqr*tmp1+a_sqr*tmp2-(a_sqr*b_sqr);
do
 {
putpixel(x_center+x,y_center+y,1);
putpixel(x_center-x,y_center-y,1);
putpixel(x_center+x,y_center-y,1);
putpixel(x_center-x,y_center+y,1);

 if(d>=0)
d=d-fy+a_sqr;
 else

 {
```

```
 x=x+1;
 d=d+fx-fy+a_sqr;
fx=fx+(2*b_sqr);
 }
  y=y-1;
fy=fy-(2*a_sqr);
  }
  while(y>0);
getch();
closegraph();
}
```

Output:


Name : Sunaina
Roll No. : 33
********* MID POINT ELLIPSE ALGORITHM *********
Enter coordinate x and y = 300
300
Now enter constants a and b = 100
150

9). Write a program to draw **Pie chart and Bar chart** in graphics.

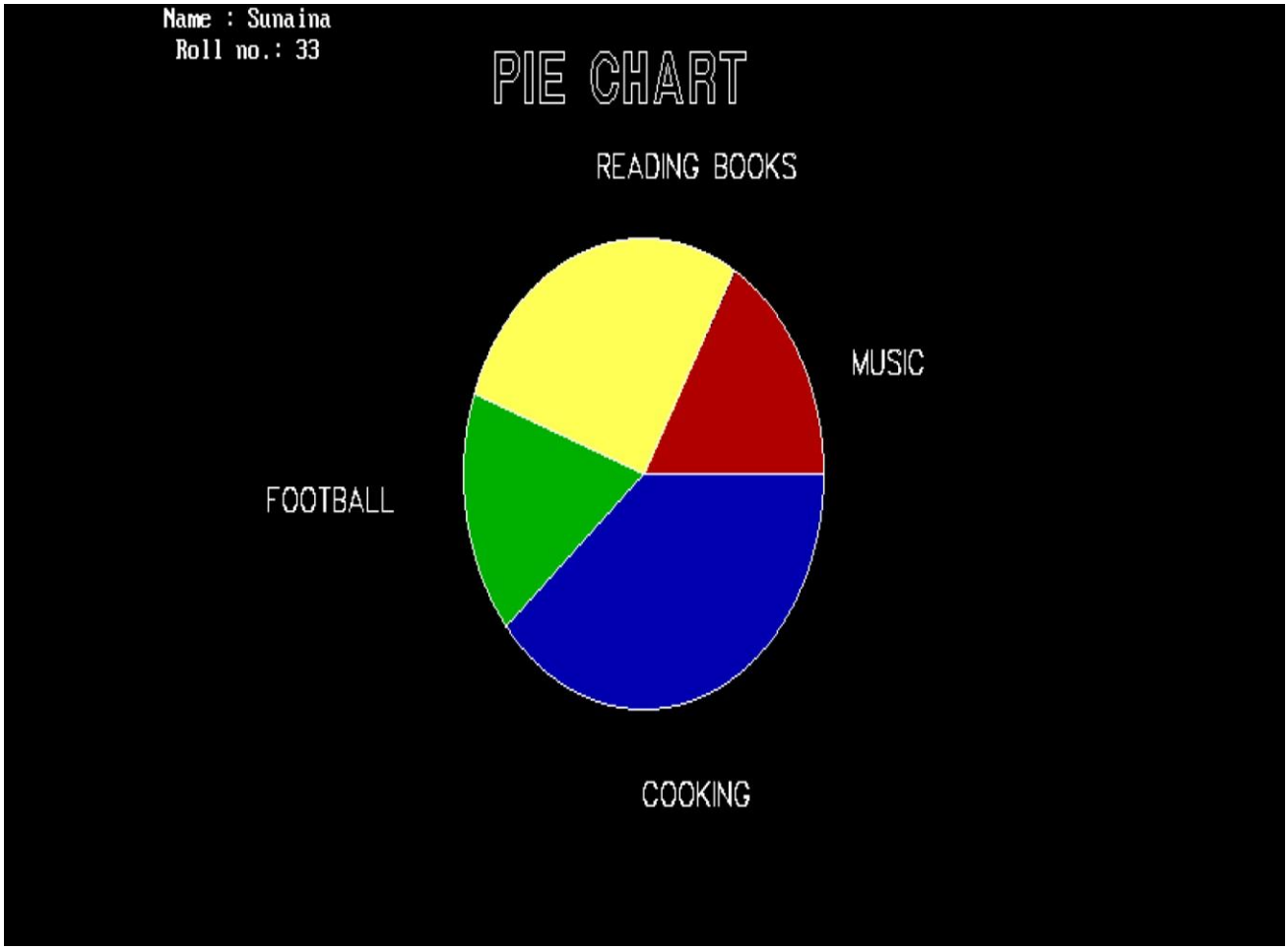
i) Pie chart:

Code:

```
/* Write a program to draw pie chart in computer
graphics. */
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
void main()
{
int gd=DETECT,gm,x,y;
initgraph(&gd,&gm,"C:\\TURBOC3\\BGI");
printf("Name : Sunaina \n Roll no.: 33 \n");
settextstyle(BOLD_FONT,HORIZ_DIR,2);
outtextxy(220,10,"PIE CHART");
x=getmaxx()/2; y=getmaxy()/2;
settextstyle(SANS_SERIF_FONT,HORIZ_DIR,1);
setfillstyle(SOLID_FILL,RED);
pieslice(x,y,0,60,120);
outtextxy(x+140,y-70,"MUSIC");
setfillstyle(SOLID_FILL,YELLOW);
pieslice(x,y,60,160,120);
```

```
outtextxy(x-30,y-170,"READING BOOKS");
setfillstyle(SOLID_FILL,GREEN);
pieslice(x,y,160,220,120);
outtextxy(x-250,y,"FOOTBALL");
setfillstyle(SOLID_FILL,BLUE);
pieslice(x,y,220,360,120);
outtextxy(x,y+150,"COOKING");
getch();
closegraph();
}
```

Output:


Name : Sunaina
Roll no.: 33
PIE CHART
READING BOOKS
MUSIC
FOOTBALL
COOKING

ii)Bar Chart:

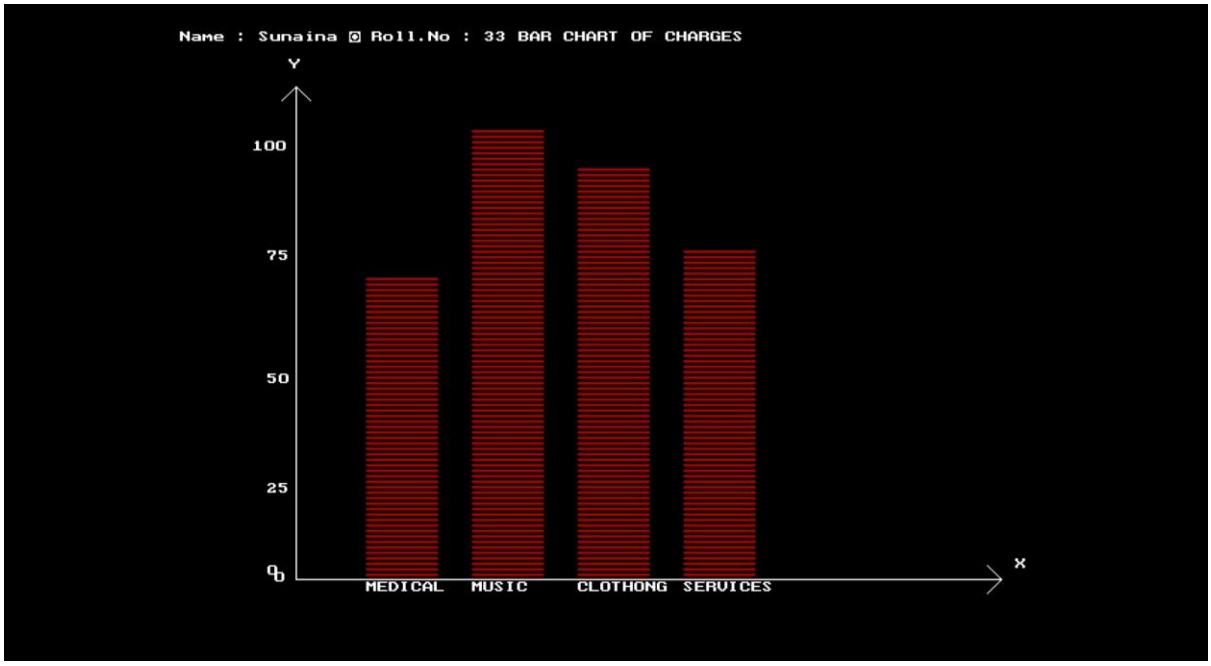
Code:

```
/* Write a program of Bar Chart in Computer Graphics.*/
#include <graphics.h>
#include <conio.h>
#include <dos.h>
#include <stdlib.h>
void main() {
        //initilizing graphic driver
      //graphic mode variable
      int gd=DETECT,gm;

//calling initgraph function with
//certain parameters
 initgraph(&gd,&gm,"C://TURBOC3\\BGI");

 //Printing message for user
outtextxy(10, 10 + 10,  " Name : Sunaina \n Roll.No : 33
BAR CHART OF CHARGES ");
```

```
 //initilizing lines for x and y axis
line(100,420,100,60);
line(100,420,600,420);
line(90,70,100,60);
line(110,70,100,60);
line(590,410,600,420);
line(590,430,600,420);

 outtextxy(95,40,"Y");
outtextxy(610,405,"X");
outtextxy(85,415,"O");

 //creating bars with certain filling style
 setfillstyle(LINE_FILL,RED);
bar(150,200,200,419);
outtextxy(150,422,"MEDICAL");
outtextxy(80,180,"75");
 setfillstyle(LINE_FILL,RED);
bar(225,90,275,419);
outtextxy(225,422,"MUSIC");
outtextxy(70,100,"100");
```

```
        etfillstyle(LINE_FILL,RED);
        bar(300,120,350,419);
        outtextxy(300,422,"CLOTHONG");
        outtextxy(80,270,"50");
        setfillstyle(LINE_FILL,RED);
        bar(375,180,425,419);
        outtextxy(375,422,"SERVICES");
        outtextxy(80,350,"25");
        outtextxy(80,410,"0"); getch();

}
```

Output:


Name : Sunaina Roll.No : 33 BAR CHART OF CHARGES
Y
100
75
50
25
0
X
MEDICAL
MUSIC
CLOTHONG
SERVICES

10) Write a program of **Transformations** in computer graphics. (i) Translations Code:

```
/* Write a program of translation in computer graphics */
#include<stdio.h>
#include <graphics.h>
#include <stdlib.h>
#include <conio.h>
void main()
{
int gd = DETECT, gm, errorcode;
int xmax, ymax,x1,y1,x2,y2,tx,ty;
initgraph(&gd, &gm, "C://TURBOC3/BGI");
printf("Name : Sunaina \n Roll No. : 33 \n ");
printf("Enter the X1 coordinate:\n");
scanf("%d",&x1);
printf("Enter the Y1 coordinate:\n "); scanf("%d",&y1);
printf("Enter the X2 coordinate:\n"); scanf("%d",&x2);
printf("Enter the Y2 coordinate:\n");
scanf("%d",&y2); line(x1,y1,x2,y2);
printf("Enter the translation vector:\n");
printf("tx:");
scanf("%d",&tx);
printf("ty:");
```

```
scanf("%d",&ty);
line(x1+tx,y1+ty,x2+tx,y2+ty);
getch();
closegraph(); }
```

Output :


Name : Sunaina
Roll No. : 33
Enter the X1 coordinate:
100
Enter the Y1 coordinate:
400
Enter the X2 coordinate:
200
Enter the Y2 coordinate:
400
Enter the translation vector:
tx:20
ty:30

(ii) Scaling :

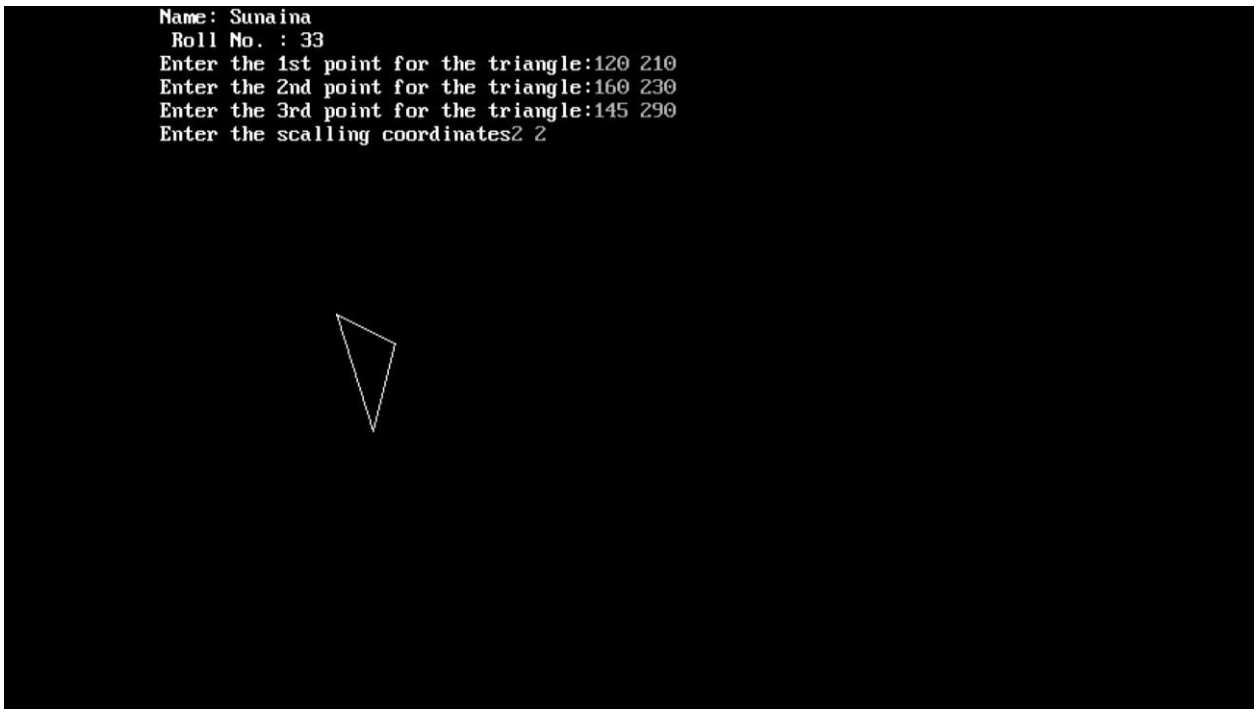
Code :

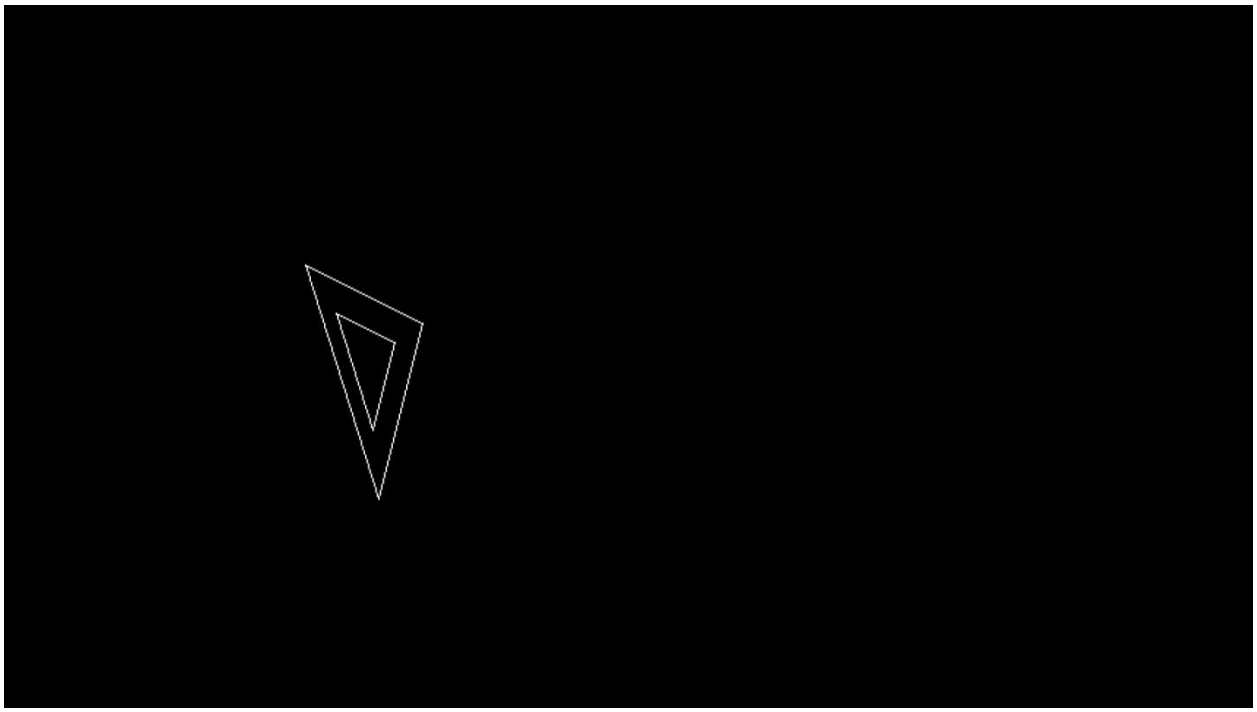
```
/* Write a program of scaling in computer graphics. */
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
#include<process.h>
#include<math.h>
int x1,y1,x2,y2,x3,y3,mx,my;
void draw();
void scale();
void main()
{
int gd=DETECT,gm;
int c;
initgraph(&gd,&gm,"C://TURBOC3/BGI");
printf("Name: Sunaina \n Roll No. : 33 \n");
printf("Enter the 1st point for the triangle:");
scanf("%d%d",&x1,&y1);
printf("Enter the 2nd point for the triangle:");
scanf("%d%d",&x2,&y2);
```

```
printf("Enter the 3rd point for the triangle:");
scanf("%d%d",&x3,&y3); draw(); scale();
}
void draw()
{
line(x1,y1,x2,y2); line(x2,y2,x3,y3);
line(x3,y3,x1,y1);
}
void scale()
{
int x,y,a1,a2,a3,b1,b2,b3; int
mx,my;
printf("Enter the scalling coordinates");
scanf("%d%d",&x,&y);
mx=(x1+x2+x3)/3;
my=(y1+y2+y3)/3;
cleardevice();
a1=mx+(x1-mx)*x;
b1=my+(y1-my)*y;
a2=mx+(x2-mx)*x;
b2=my+(y2-my)*y;
```

```
a3=mx+(x3-mx)*x;
b3=my+(y3-my)*y;
line(a1,b1,a2,b2);
line(a2,b2,a3,b3);
line(a3,b3,a1,b1);
draw();
getch();
}
```

Output:


Name: Sunaina
Roll No. : 33
Enter the 1st point for the triangle:120 210
Enter the 2nd point for the triangle:160 230
Enter the 3rd point for the triangle:145 290
Enter the scalling coordinates2 2



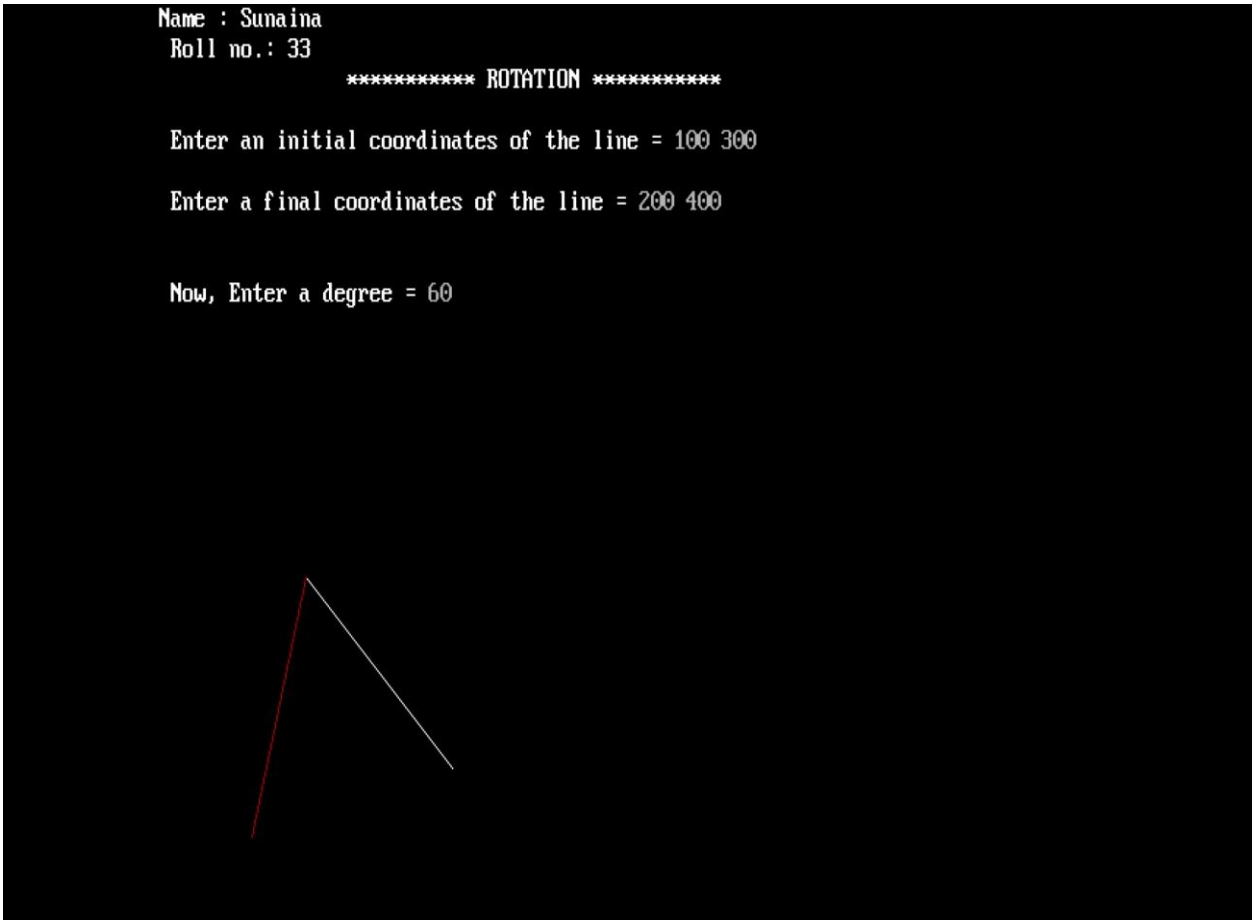
(iii) Rotation:

Code:

```
/* Write a program of rotation in computer graphics. */
#include<graphics.h>
#include<stdio.h>
#include<conio.h>
#include<math.h>
void main()
{
int gd=DETECT,gm;
int pivot_x,pivot_y,x,y;
 double degree,radian; int
rotated_point_x,rotated_point_y;
initgraph(&gd,&gm,"C://TURBOC3/BGI");
cleardevice();
printf("Name : Sunaina \n Roll no.: 33 \n ");
printf("\t\t********** ROTATION ********** \n");
printf("\n Enter an initial coordinates of the line = ");
scanf("%d %d",&pivot_x,&pivot_y);
printf("\n Enter a final coordinates of the line = ");
scanf("%d %d",&x,&y);

line(pivot_x,pivot_y,x,y);
```

```
printf("\n\n Now, Enter a degree = ");
scanf("%lf",&degree);
radian=degree*0.01745;
rotated_point_x=(int)(pivot_x +((x-pivot_x)*cos(radian)-
(y-pivot_y)*sin(radian))); rotated_point_y=(int)(pivot_y
+((xpivot_x)*sin(radian)+(y-pivot_y)*cos(radian)));
setcolor(RED);
line(pivot_x,pivot_y,rotated_point_x,rotated_point_y);
getch();
closegraph();
}
```

Output:

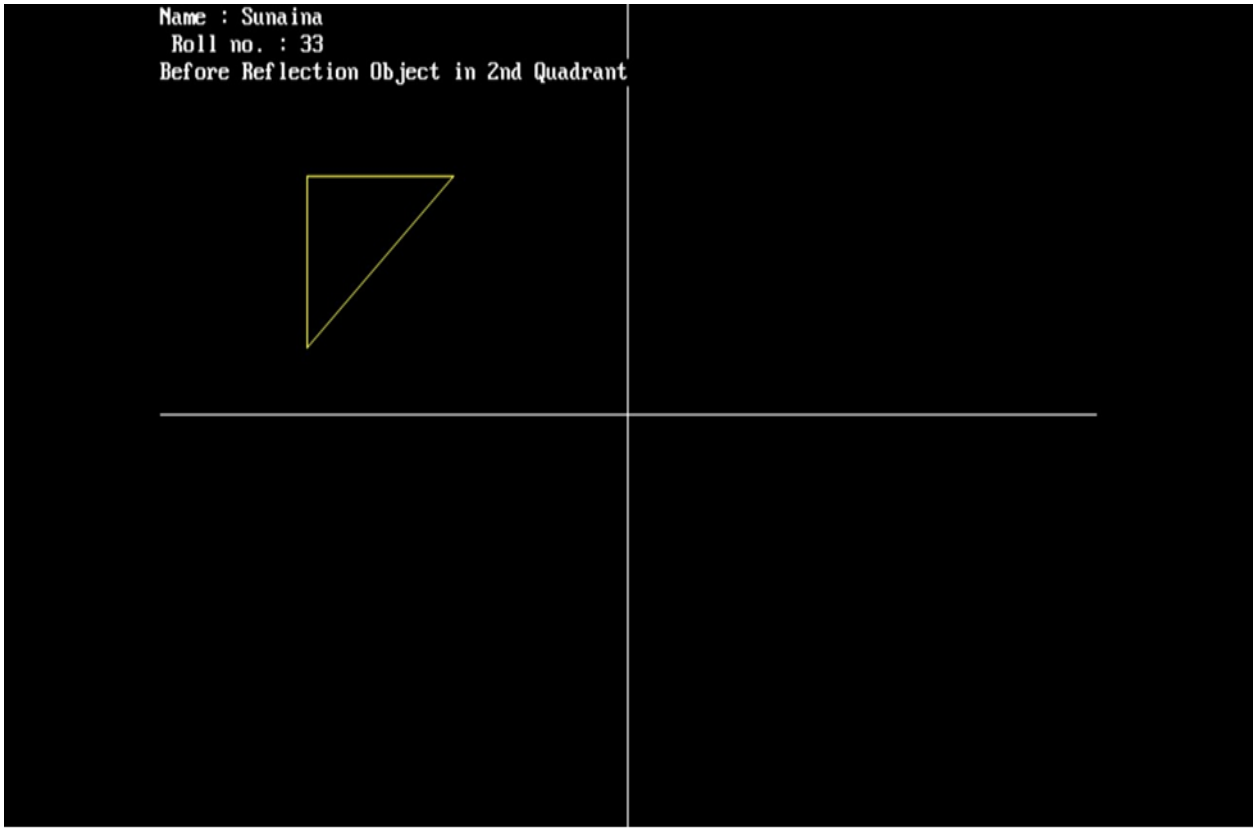

Name : Sunaina
Roll no.: 33
********** ROTATION **********
Enter an initial coordinates of the line = 100 300
Enter a final coordinates of the line = 200 400
Now, Enter a degree = 60

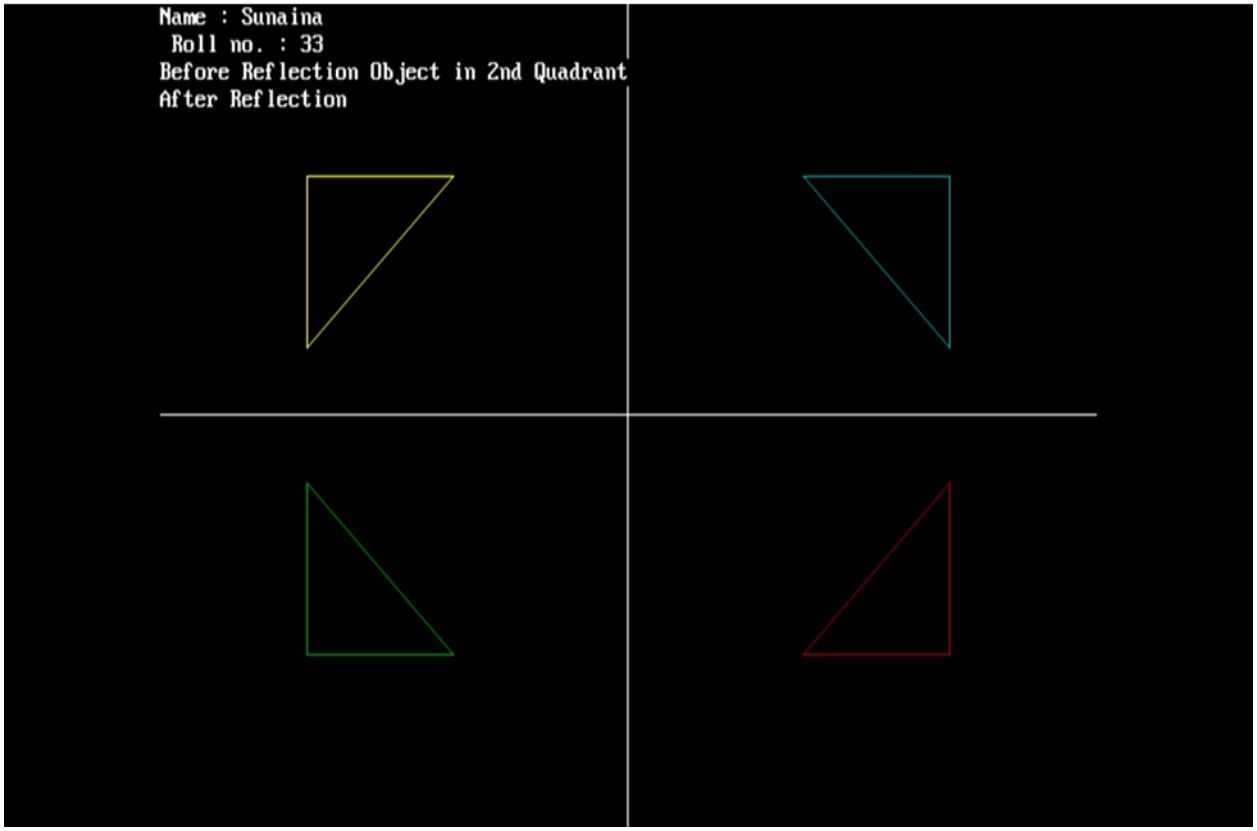
(iv) Reflection:

Code:

```
/* Write a program of reflection in computer graphics. */
#include <conio.h>
#include <graphics.h>
#include <stdio.h>
void main()
{
 int gm, gd = DETECT, ax, x1 = 100;
int x2 = 100, x3 = 200, y1 = 100;
int y2 = 200, y3 = 100;
 initgraph(&gd, &gm, "C://TURBOC3/BGI");
cleardevice();
 printf("Name : Sunaina \n Roll no. : 33 \n");
line(getmaxx() / 2, 0, getmaxx() / 2,getmaxy());
line(0, getmaxy() / 2, getmaxx(),getmaxy() / 2);
printf("Before Reflection Object in 2nd Quadrant");
setcolor(14);
line(x1, y1, x2, y2);
line(x2, y2, x3, y3);
line(x3, y3, x1, y1);
```

```
 getch();
 printf("\nAfter Reflection");
setcolor(4);
      line(getmaxx() - x1, getmaxy() - y1,getmaxx() - x2,
getmaxy() - y2);
      line(getmaxx() - x2, getmaxy() - y2,getmaxx() - x3,
getmaxy() - y3);
      line(getmaxx() - x3, getmaxy() - y3,getmaxx() - x1,
getmaxy() - y1);
setcolor(3);
 line(getmaxx() - x1, y1,getmaxx() - x2, y2);
line(getmaxx() - x2, y2,getmaxx() - x3, y3);
line(getmaxx() - x3, y3,getmaxx() - x1, y1);
setcolor(2);
 line(x1, getmaxy() - y1, x2,getmaxy() - y2);
line(x2, getmaxy() - y2, x3,getmaxy() - y3);
line(x3, getmaxy() - y3, x1,getmaxy() - y1);
getch();
closegraph();
}
```


Name : Sunaina
Roll no. : 33
Before Reflection Object in 2nd Quadrant


Name : Sunaina
Roll no. : 33
Before Reflection Object in 2nd Quadrant
After Reflection

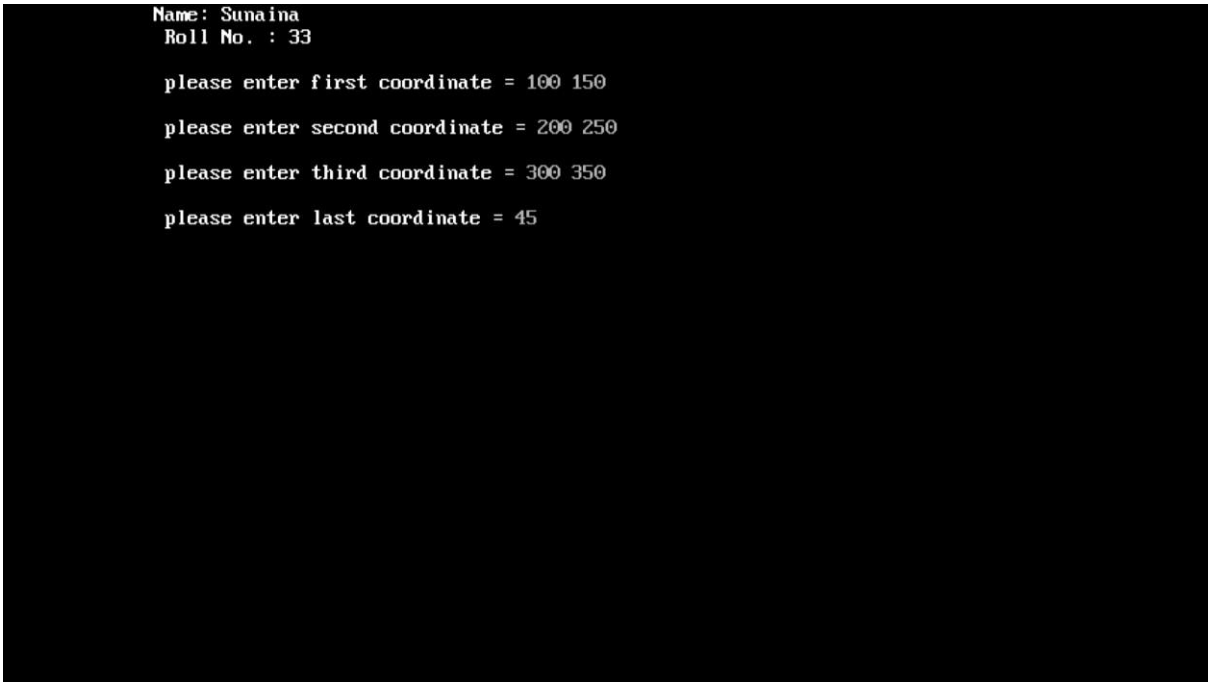
(v) Shearing:

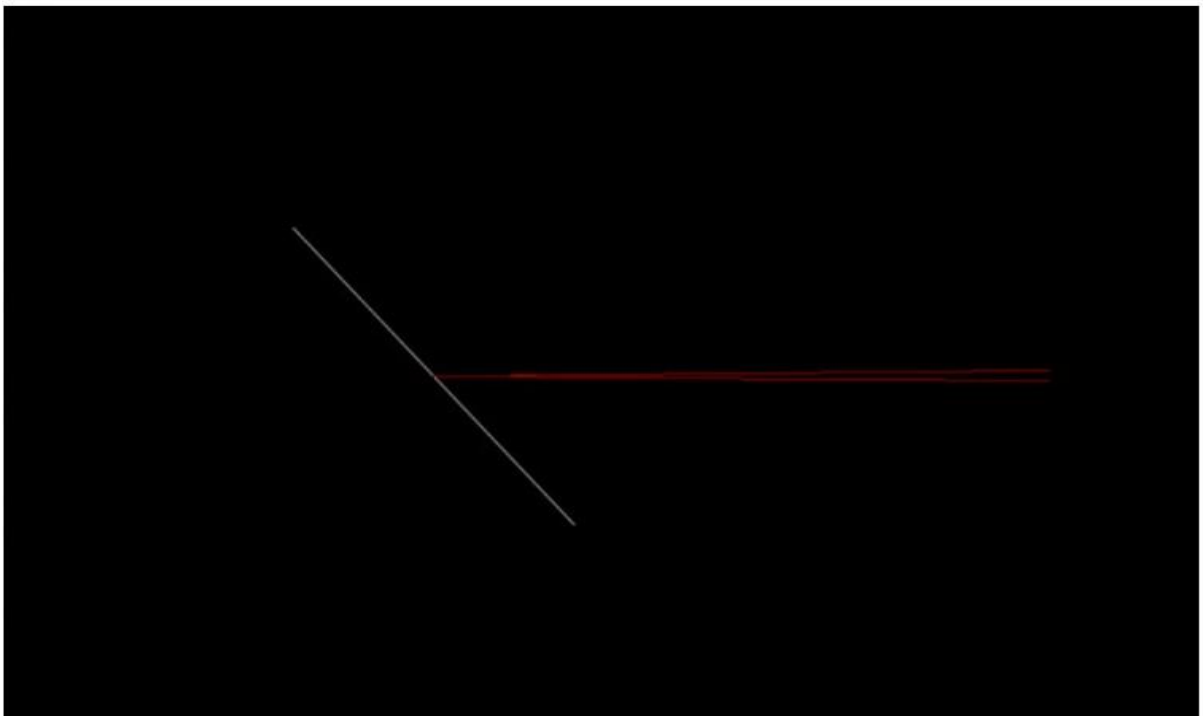
Code:

```
/* Write a program of shearing in computer graphics */
#include<stdio.h>
#include<graphics.h>
#include<conio.h>
void main()
{
int gd=DETECT,gm;
int x,y,x1,y1,x2,y2,x3,y3,shear_f;
initgraph(&gd,&gm,"C://TURBOC3/BGI");
printf("Name: Sunaina \n Roll No. : 33 \n ");
printf("\n please enter first coordinate = ");
scanf("%d %d",&x,&y);
printf("\n please enter second coordinate = ");
scanf("%d %d",&x1,&y1);
printf("\n please enter third coordinate = ");
scanf("%d %d",&x2,&y2);
printf("\n please enter last coordinate = ");
scanf("%d %d",&x3,&y3);
printf("\n please enter shearing factor x = ");
scanf("%d",&shear_f);
cleardevice(); line(x,y,x1,y1);
line(x1,y1,x2,y2);
```

```
line(x2,y2,x3,y3);
line(x3,y3,x,y);

setcolor(RED);
x=x+ y*shear_f;
x1=x1+ y1*shear_f;
x2=x2+ y2*shear_f;
x3=x3+ y3*shear_f;

line(x,y,x1,y1);
line(x1,y1,x2,y2);
line(x2,y2,x3,y3);
line(x3,y3,x,y);
getch();
closegraph();
}
```

Output:


Name: Sunaina
Roll No. : 33
please enter first coordinate = 100 150
please enter second coordinate = 200 250
please enter third coordinate = 300 350
please enter last coordinate = 45



11) Write a program of **Polygon** in computer graphics.

i) Floodfill.

ii) Boundary-fill.

i) Floodfill:

Code:

```
/* Write a program of floodfill - 4 connected in
computer graphics.*/
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
#include<dos.h>
void flood(int,int,int,int);
void main()
{
int gd,gm=DETECT;
clrscr();
detectgraph(&gd,&gm);
initgraph(&gd,&gm,"C:\\TurboC3\\BGI");
printf("Name: Sunaina \n Roll no.: 33\n ");
printf("FLOOFDFILL 4-CONNECTED");
rectangle(50,50,100,100);
flood(55,55,9,0);
getch();
```

```
}
void flood(int x,int y, int fill_col, int old_col)
{
if(getpixel(x,y)==old_col)
{
delay(1); putpixel(x,y,fill_col);
flood(x+1,y,fill_col,old_col);
flood(x-1,y,fill_col,old_col);
flood(x,y+1,fill_col,old_col);
flood(x,y-1,fill_col,old_col);
}
}
```

Output:

ii)Boundary Fill:

Code:

```
/* Write a program of Boundary-fill in computer
graphics */
#include<stdio.h>
#include<graphics.h>
#include<dos.h>
#include<conio.h>
void boundaryFill8(int x, int y, int fill_color,int
boundary_color)
{
if(getpixel(x, y) != boundary_color && getpixel(x,
y) != fill_color)
{
putpixel(x, y, fill_color);
boundaryFill8(x + 1, y, fill_color, boundary_color);
boundaryFill8(x, y + 1, fill_color, boundary_color);
boundaryFill8(x - 1, y, fill_color, boundary_color);
boundaryFill8(x, y - 1, fill_color, boundary_color);
boundaryFill8(x - 1, y - 1, fill_color, boundary_color);
boundaryFill8(x - 1, y + 1, fill_color, boundary_color);
boundaryFill8(x + 1, y - 1, fill_color, boundary_color);
boundaryFill8(x + 1, y + 1, fill_color, boundary_color);
```

```
}
}
void main(){
int gd = DETECT, gm;
initgraph(&gd, &gm, "C://TURBOC3/BGI");
printf("Name: Sunaina \n Roll no.: 33\n")
printf("********** BOUNDARYFILL
8CONNECTED**********");
// Rectangle function
rectangle(50, 50, 100, 100);
// Function calling
boundaryFill8(55, 55,4, 15);
delay(100);
getch();
closegraph();
}
```

Output:

12) Write a program of **Clipping** in computer graphics.

i) Point Clipping.

ii) Line Clipping.

i) Point Clipping:

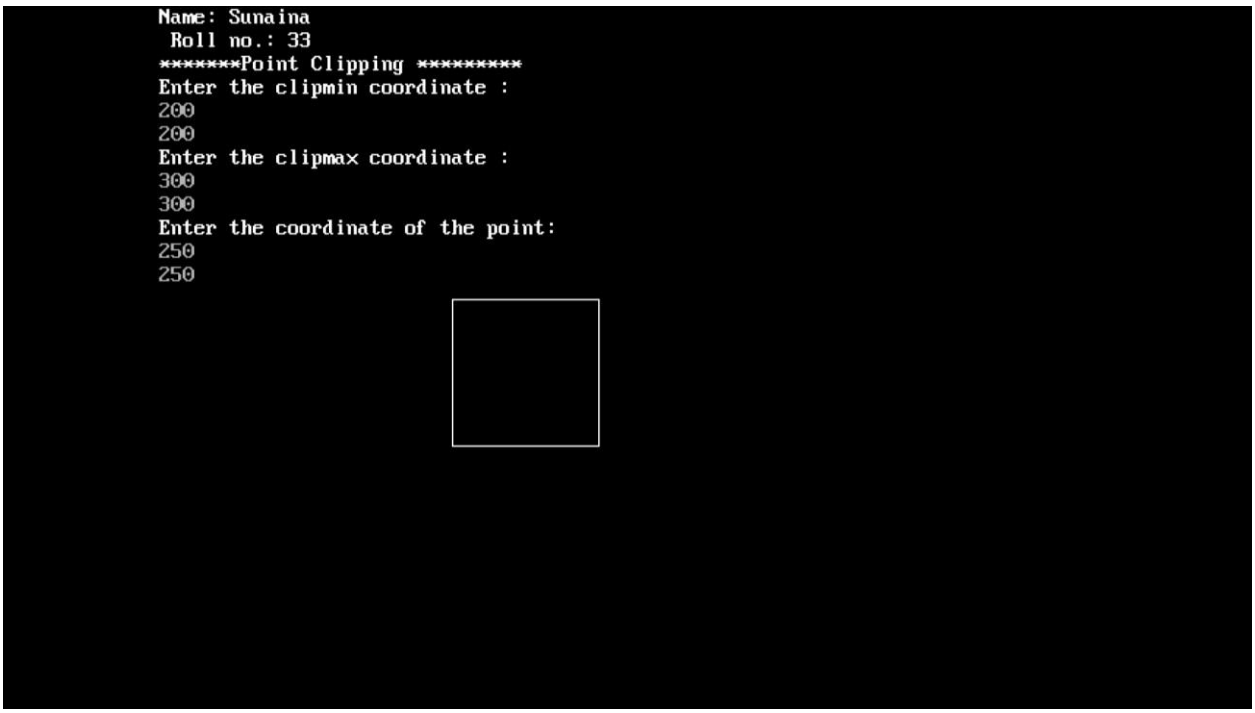
Code:

```
/* Write a program of point clipping in computer
graphics */
#include<stdio.h>
#include<conio.h>
#include<graphics.h>
#include<stdlib.h>
void main()
{
   int
gd,gm,xcmin,ycmin,xcmax,ycmax,x,y,c;
clrscr();
detectgraph(&gm,&gd);
 initgraph(&gm,&gd,"C://TURBOC3/BGI");
printf("Name: Sunaina \n Roll no.: 33 \n");
printf("*******Point Clipping *********\n");
printf("Enter the clipmin coordinate :\n");
scanf("%d%d",&xcmin,&ycmin);
```

```
printf("Enter the clipmax coordinate :\n");
scanf("%d%d",&xcmax,&ycmax);

rectangle(xcmin,ycmax,xcmax,ycmin);
printf("Enter the coordinate of the point:\n");
scanf("%d%d",&x,&y);
detectgraph(&gm,&gd);
initgraph(&gm,&gd,"C://TURBOC3/BGI");
putpixel(x,y,15);
printf("\n1.Point clipping\n2.Exit\nEnter your
choice:\n");
scanf("%d",&c);
 switch(c)
    {
      case 1:
     detectgraph(&gm,&gd);
     initgraph(&gm,&gd,"C://TURBOC3//BGI");
     rectangle (xcmin,ycmax,xcmax,ycmin);
printf("*******POINT CLIPPING******\n");
if ((xcmin<x) && (x<xcmax))
     {
     if ((ycmin<y) && (y<ycmax))
    {
```

```
    printf("The point is inside the clip window\n");
    putpixel(x,y,15);
    }
    }
     else
     printf("The point is outside the clipwindow \nThe
point is clipped\n");
break;
case 2: exit(0);
   }
getch();
}
```

Output:


Name: Sunaina
Roll no.: 33
*******Point Clipping *********
Enter the clipmin coordinate :
200
200
Enter the clipmax coordinate :
300
300
Enter the coordinate of the point:
250
250


*******POINT CLIPPING******
The point is inside the clip window

ii)Line Clipping:

Code:

```
/* Write a program of line clipping in computer graphics
*/
#include<graphics.h>
#include<conio.h>
#include<stdio.h>
#include<math.h>
#include<dos.h>
void main()
{ int
rcode_begin[4]={0,0,0,0},rcode_end[4]={0,0,0,0},region_
code[4];
int
W_xmax,W_ymax,W_xmin,W_ymin,flag=0;
float slope; int x,y,x1,y1,i, xc,yc;
 int gr=DETECT,gm;
initgraph(&gr,&gm,"C://TURBOC3/BGI");
printf("Name: Sunaina \n Roll no.: 33 \n");
printf("\n****** Cohen Sutherlsnd Line
Clipping algorithm **********");
printf("\n Now, enter XMin, YMin =");
scanf("%d %d",&W_xmin,&W_ymin);
```

```
printf("\n First enter XMax, YMax =");
scanf("%d %d",&W_xmax,&W_ymax);
printf("\n Please enter intial point x and y= ");
scanf("%d %d",&x,&y);
printf("\n Now, enter final point x1 and y1=
");
scanf("%d %d",&x1,&y1); cleardevice();
rectangle(W_xmin,W_ymin,W_xmax,W_ymax);
line(x,y,x1,y1);
line(0,0,600,0);
line(0,0,0,600);
if(y>W_ymax)  {
rcode_begin[0]=1;    // Top
flag=1 ;
}
if(y<W_ymin) {
rcode_begin[1]=1;          // Bottom
flag=1;
}
if(x>W_xmax)  {
rcode_begin[2]=1;          // Right
flag=1;
}
```

```
if(x<W_xmin)   { rcode_begin[3]=1;
//Left
flag=1;
}

//end point of Line if(y1>W_ymax){
rcode_end[0]=1;         // Top
flag=1;
}
if(y1<W_ymin) { rcode_end[1]=1;
// Bottom flag=1;
}
if(x1>W_xmax){
rcode_end[2]=1;         // Right
flag=1;
}
if(x1<W_xmin){
rcode_end[3]=1;         //Left
flag=1;
 }
if(flag==0)
{
printf("No need of clipping as it is already in window");
```

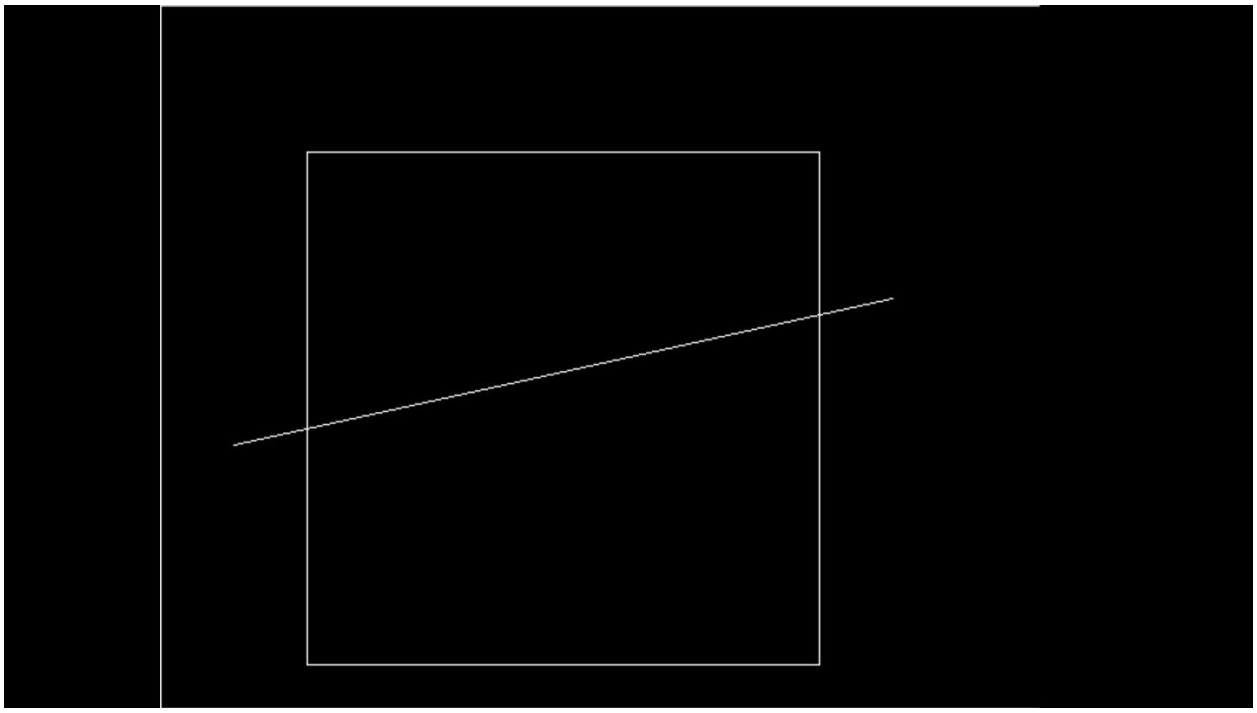
```
}
flag=1;
for(i=0;i<4;i++){
region_code[i]= rcode_begin[i] && rcode_end[i]
; if(region_code[i]==1)  flag=0;
}
if(flag==0)
{
printf("\n Line is completely outside the window");
}
else{
slope=(float)(y1-y)/(x1-x);
if(rcode_begin[2]==0 && rcode_begin[3]==1)   //left
{
y=y+(float) (W_xmin-x)*slope ;
x=W_xmin;

}
if(rcode_begin[2]==1 && rcode_begin[3]==0)      //
right
{
y=y+(float) (W_xmax-x)*slope ; x=W_xmax;
```

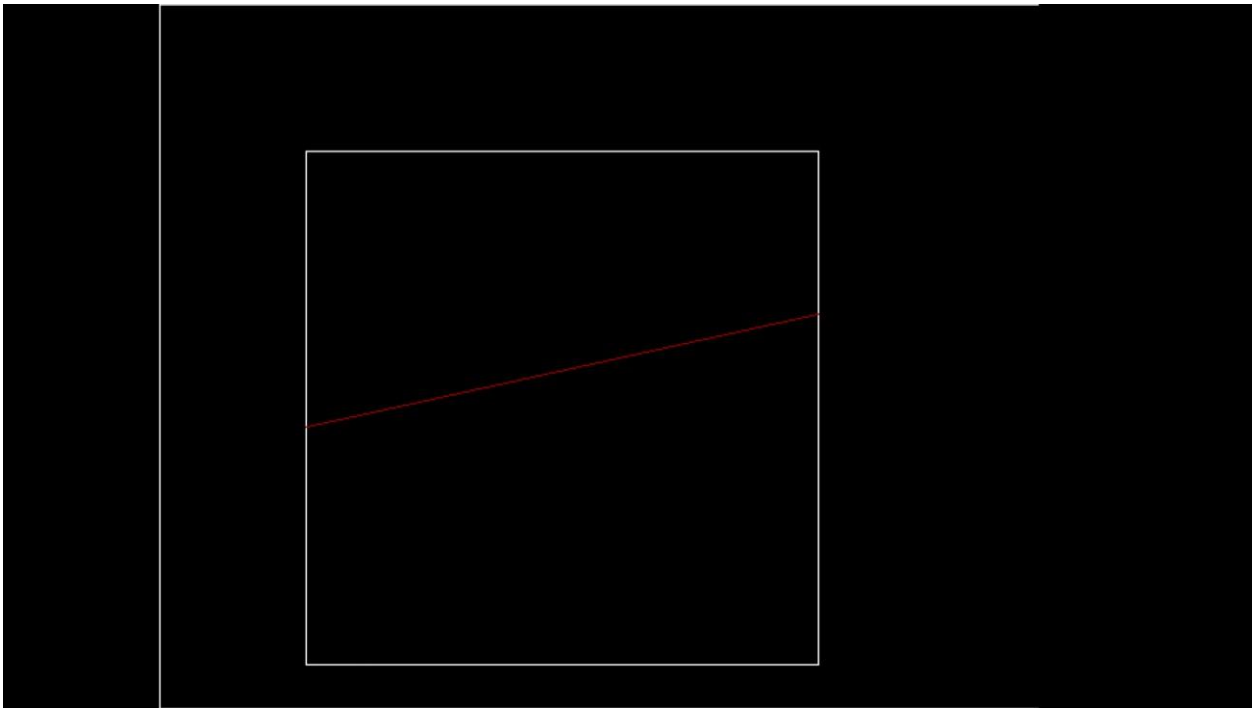
```
}
if(rcode_begin[0]==1 && rcode_begin[1]==0)     // top
{
x=x+(float) (W_ymax-y)/slope ; y=W_ymax;

}
if(rcode_begin[0]==0 && rcode_begin[1]==1)     //
bottom
{
x=x+(float) (W_ymin-y)/slope ; y=W_ymin;

}
// end points
if(rcode_end[2]==0 && rcode_end[3]==1)   //left
{
y1=y1+(float) (W_xmin-x1)*slope ; x1=W_xmin;

}
if(rcode_end[2]==1 && rcode_end[3]==0)      // right
{
y1=y1+(float) (W_xmax-x1)*slope ; x1=W_xmax;

}
```

```
    if(rcode_end[0]==1 && rcode_end[1]==0)     // top
    {
    x1=x1+(float) (W_ymax-y1)/slope ; y1=W_ymax;

    }
    if(rcode_end[0]==0 && rcode_end[1]==1)     // bottom
    {
    x1=x1+(float) (W_ymin-y1)/slope ;
    y1=W_ymin;

    }
    }
    delay(1000);
    clearviewport();
rectangle(W_xmin,W_ymin,W_xmax,W_ymax);
line(0,0,600,0);
line(0,0,0,600);
setcolor(RED);
line(x,y,x1,y1);
getch();
closegraph();
    }
```

Output:

```
Name: Sunaina
 Roll no.: 33

****** Cohen Sutherlsnd Line Clipping algorithm ***********
 Now, enter XMin, YMin =100 100

 First enter XMax, YMax =450 450

 Please enter intial point x and y= 500 200

 Now, enter final point x1 and y1= 50 300
```





13) How **to Download and install MongoDB** On Windows.

Procedure:

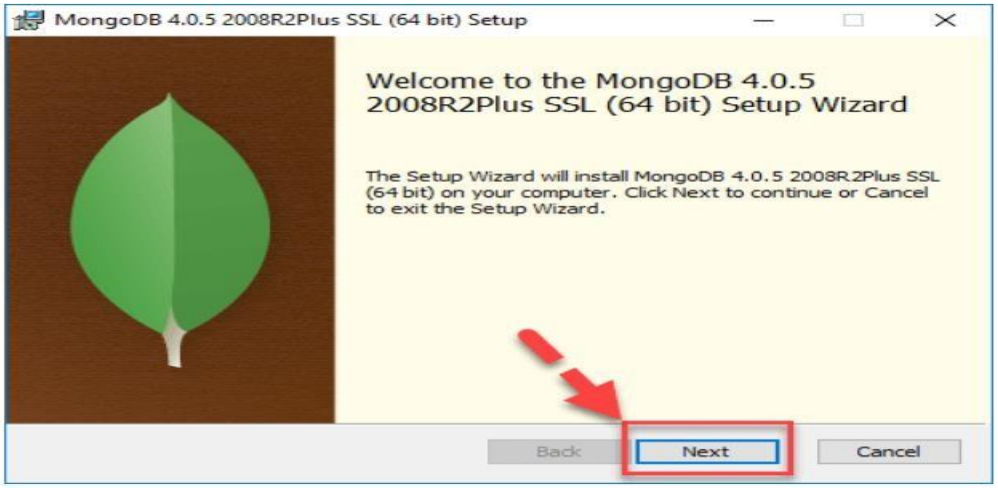
The following steps can be used to download and install MongoDB on Windows 10.

Step 1) Download MongoDB Community Server

Go to link and Download MongoDB Community Server. We will install the 64-bit version for Windows.

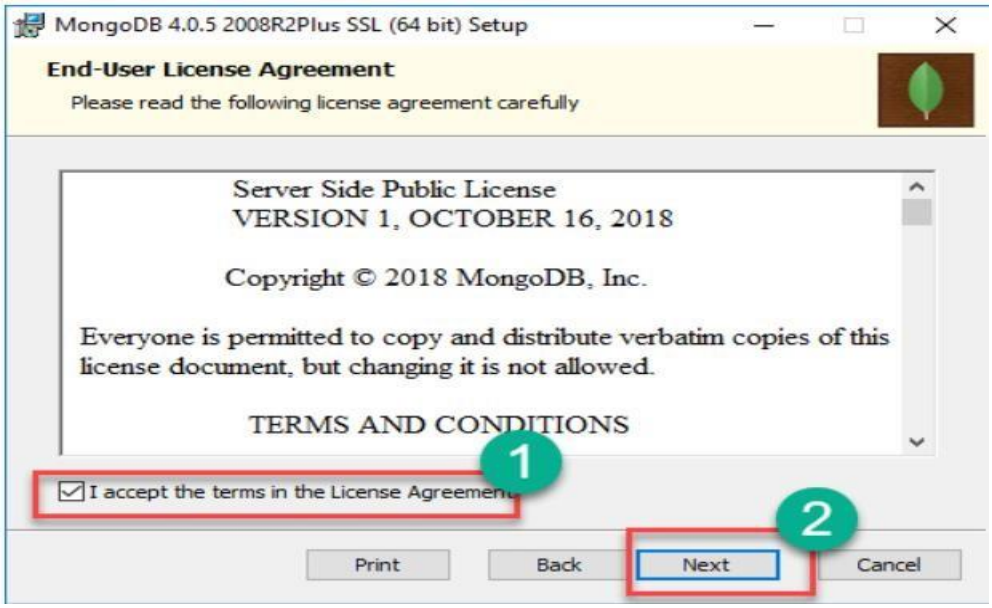
Step 2) Click on Setup

Once download is complete open the msi file. Click Next in the start up screen.



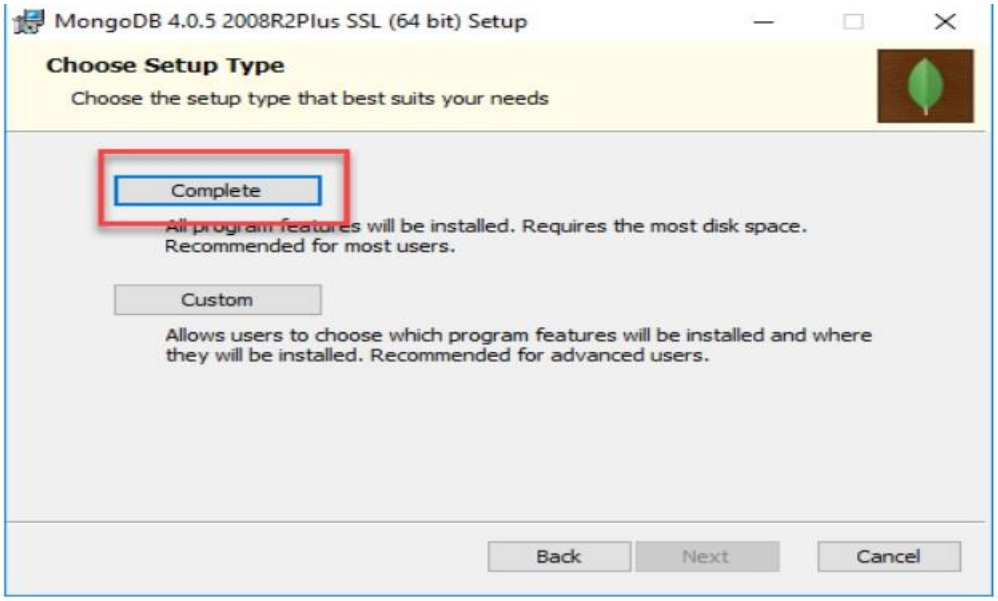
Step 3) Accept the End-User License Agreement Accept the End-User License Agreement.

Click Next.



Step 4) Click on the "complete" button

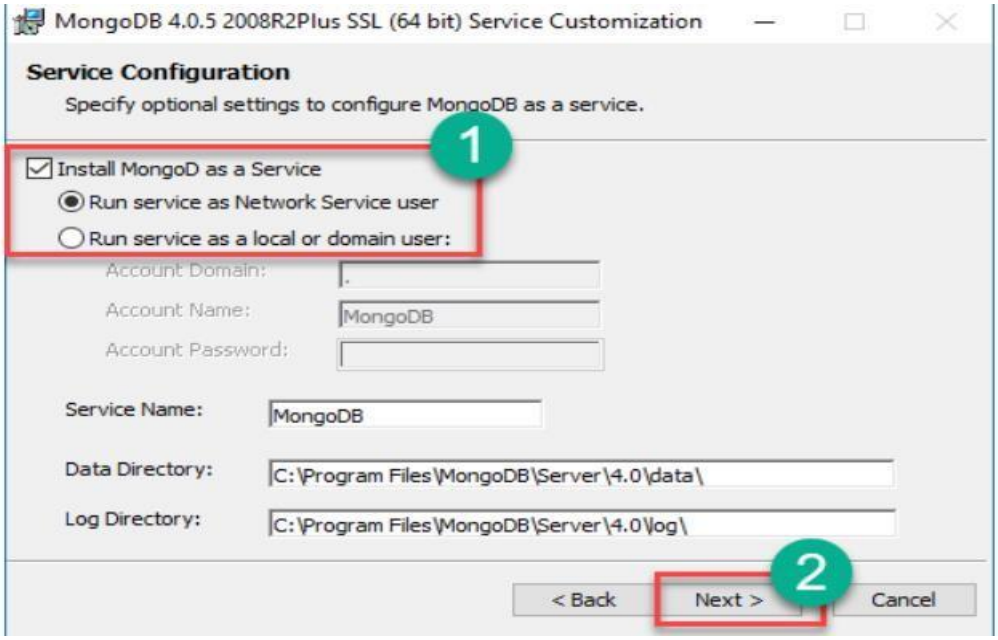
Click on the "complete" button to install all of the components. The custom option can be used to install selective components or if you want to change the location of the installation.



Step 5) Service Configuration

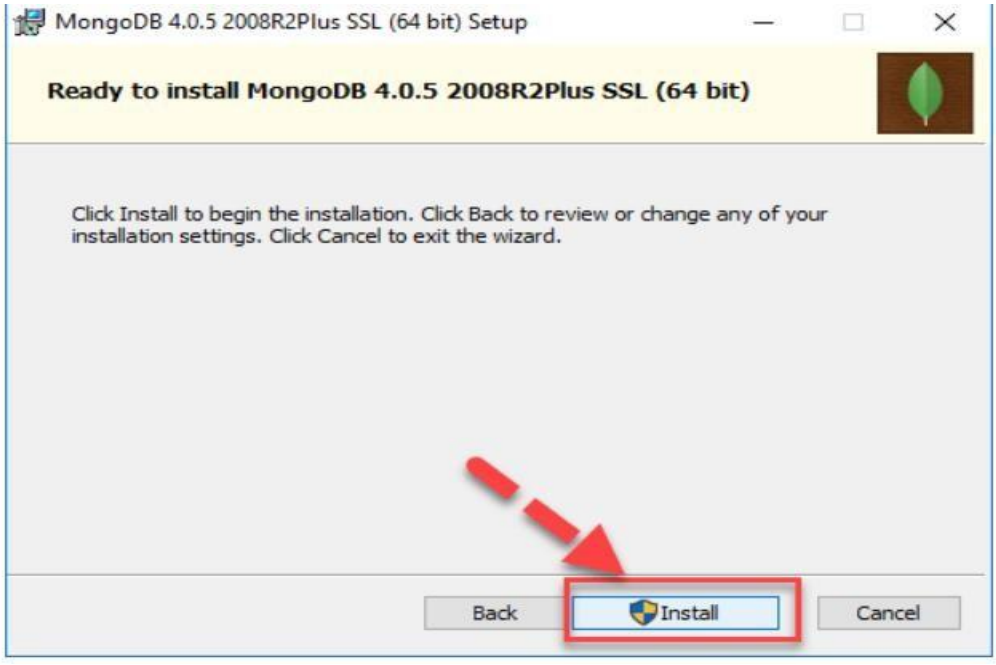
Select “Run service as Network Service user”. make a note of the data directory, we’ll need this later.

Click Next.



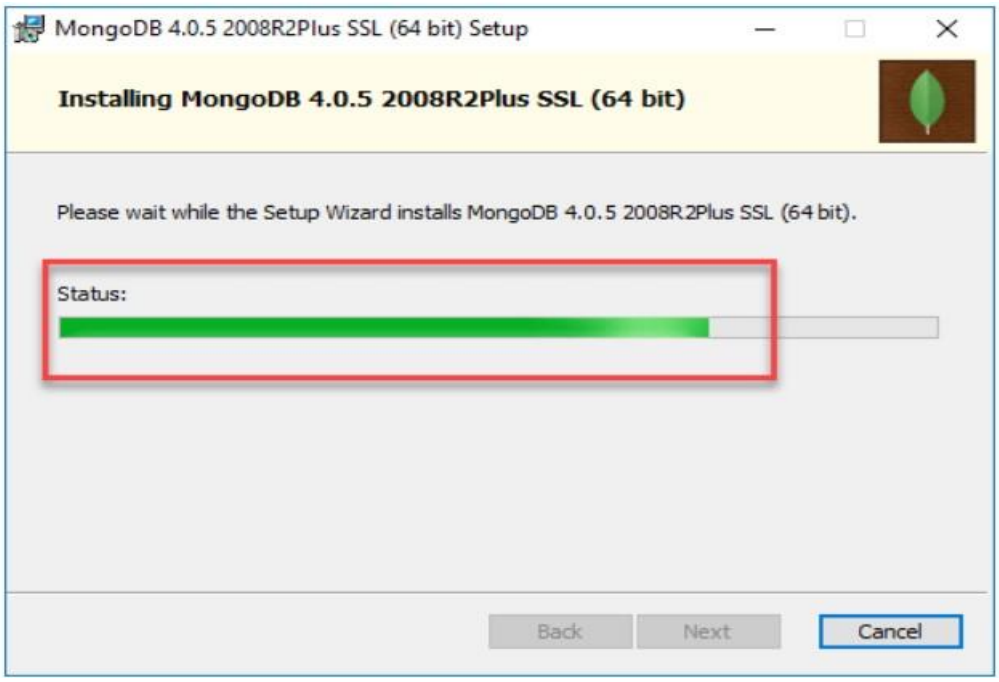
Step 6) Start installation process

Click on the Install button to start the installation.



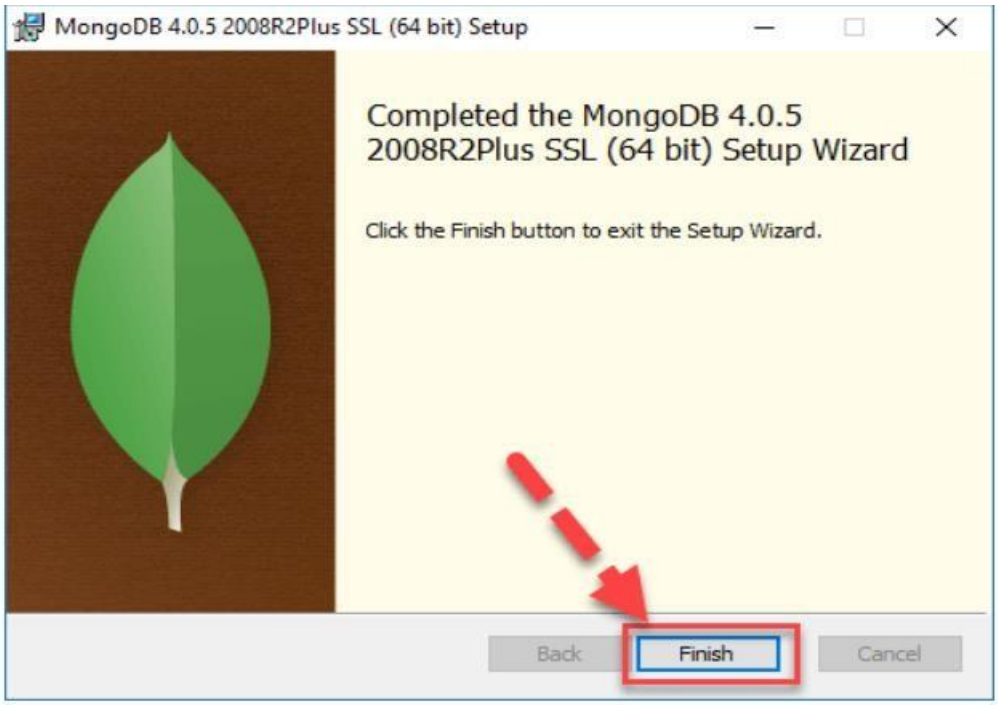
Step 7) Click Next once completed

Installation begins. Click Next once completed.



Step 8) Click on the Finish button

Final step, Once complete the installation, Click on the Finish button.



14) Write the various **database , collections and document based commands** in MongoDB.

Database Commands:

1. **Create new database:**

To create a new database execute the following command.

use DATABASE_NAME

```
> use University
switched to db University
> use College
switched to db College
>
```

2. **Show All Databases:**

Use below command to get list of all databases. **show dbs**

```
> show dbs
MyData   0.000GB
admin    0.000GB
config   0.000GB
local    0.000GB
>
```

3. **Know your current selected database**

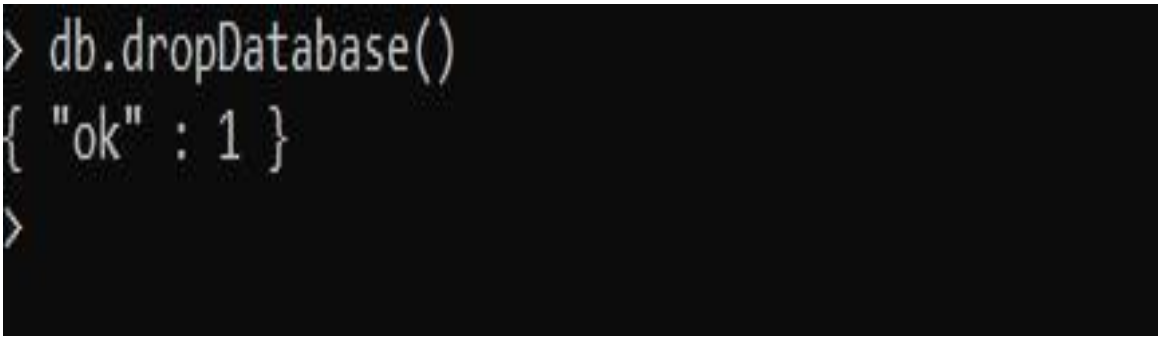
To know your current working/selected database execute the following command

Db

```
> db
College
>
```

4. **Delete database**

To drop the database execute following command, this will drop the selected database **db.dropDatabase()**

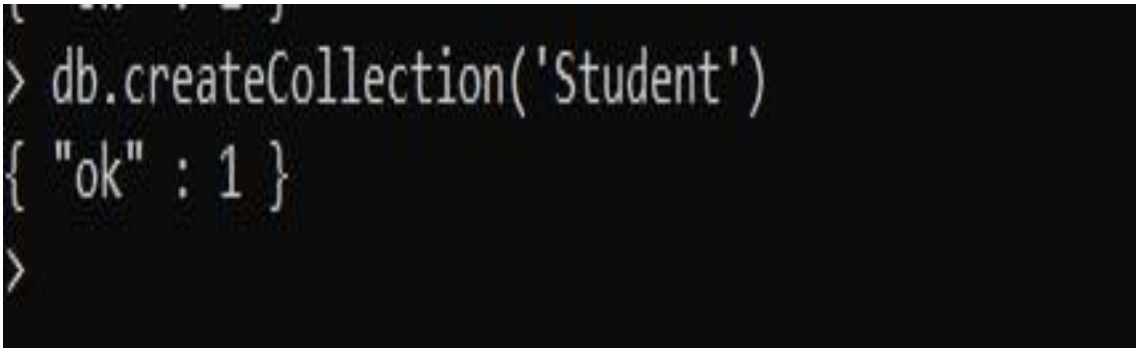


Collection Commands:

1. **Create collection**

To create the new collection execute the following commands

db.createCollection(coll_name)



2. **To check collections list**

To get the list of collections created execute the following command

Show collections

3. **Drop collection**

To drop the selected collection execute the following command

db.COLLECTION_NAME.drop()

```
> db.Student.drop()
true
>
```

Document Commands:

1. **Insert document in collection**

db.COLLECTION_NAME.insert(document)

To insert single document in selected collection execute the following command.

```
> db.Student.insert({name:'ABC',rollno:'33'})
WriteResult({ "nInserted" : 1 })
>
```

2. **Insert many document in collection**

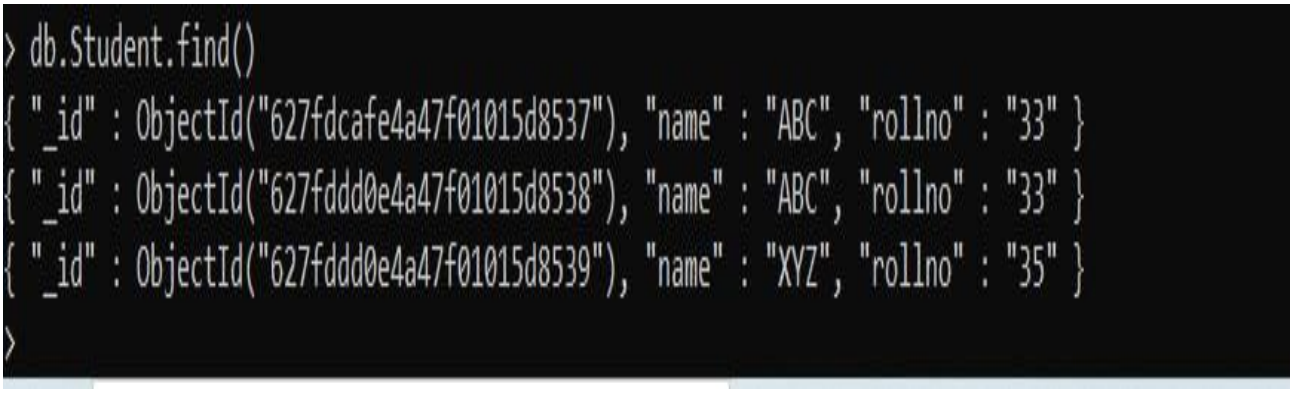
To insert multiple documents in selected collection execute following command:

db.COLLECTION_NAME.insertMany(document)

```
> db.Student.insertMany([{name:'ABC',rollno:'33'},{name:'XYZ',rollno:'35'}])
{
        "acknowledged" : true,
        "insertedIds" : [
                ObjectId("627fddd0e4a47f01015d8538"),
                ObjectId("627fddd0e4a47f01015d8539")
        ]
}
>
```

3. **Get collection document**

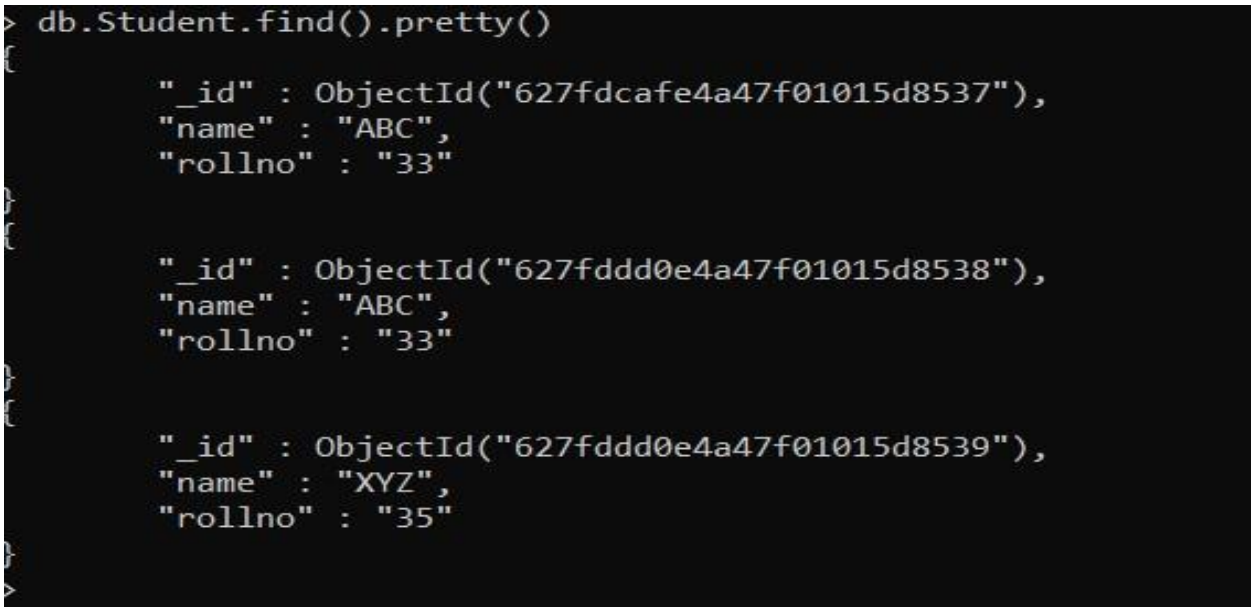
To get the list documents in collection execute the following command **db.COLLECTION_NAME.find()**



4. **Get collection document**

To show all the rows in the document in pretty form.

db.COLLECTION_NAME.find().pretty().



5. **Get First Row Matching.**

To find the first row matching the object.

db.COLLECTION_NAME.findOne(Condition)

```
> db.Student.findOne({name:'XYZ'})
{
        "_id" : ObjectId("627fddd0e4a47f01015d8539"),
        "name" : "XYZ",
        "rollno" : "35"
}
>
```

6. **Limit()**

This MongoDB command limits the no. of records need to use in MongoDB. The argument of this function accepts only number type. The argument is the number of the document that needs to be displayed.

db.coll_name.find().limit(Number).

```
> db.Student.find().limit(2)
{ "_id" : ObjectId("627fdcafe4a47f01015d8537"), "name" : "ABC", "rollno" : "33" }
{ "_id" : ObjectId("627fddd0e4a47f01015d8538"), "name" : "ABC", "rollno" : "33" }
>
```

7. **Count()**

This is to count the number of rows in a output.

db.coll_name.find().count()

```
> db.Student.find().count()
3
>
```

8. **Update Document.**

To update the document in collection execute the following command

db.COLLECTION_NAME.update(SELECTION_CRITERIA, UPDATED_DATA)

```
> db.Student.update({name:'ABC'},{$set:{name:'EFG'}})
WriteResult({ "nMatched" : 1, "nUpserted" : 0, "nModified" : 1 })
> db.Student.find()
{ "_id" : ObjectId("627fdcafe4a47f01015d8537"), "name" : "EFG", "rollno" : "33" }
{ "_id" : ObjectId("627fddd0e4a47f01015d8538"), "name" : "ABC", "rollno" : "33" }
{ "_id" : ObjectId("627fddd0e4a47f01015d8539"), "name" : "XYZ", "rollno" : "35" }
>
```

9. **Delete Document.**

To delete document in selected collection execute the following command

db.COLLECTION_NAME.remove(DELLETION_CRITTERIA)

```
> db.Student.remove({name:'ABC'})
WriteResult({ "nRemoved" : 1 })
> db.Student.find().pretty()
{
        "_id" : ObjectId("627fdcafe4a47f01015d8537"),
        "name" : "EFG",
        "rollno" : "33"
}
{
        "_id" : ObjectId("627fddd0e4a47f01015d8539"),
        "name" : "XYZ",
        "rollno" : "35"
}
>
```