U18CO018
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Assignment-3
Subject:- Computer Graphics
Topic:- Graphics Function

Main Code:

```
int main() {
    int gd = DETECT, gm;
    initgraph(&gd,&gm,"");
    // 1
    home();
    // 2
    getch();
    cleardevice();
    graphdefaults();
    kite();
    // 3
    getch();
    cleardevice();
    graphdefaults();
    flag();
    // 4
    getch();
    cleardevice();
    graphdefaults();
    movingcar();
    // 5
    getch();
    cleardevice();
    graphdefaults();
    linedrawing();
    // End
    getch();
    closegraph();
    return 0;
}
```

1. Write a program to design a House and color it using pre-defined functions of graphics.h.

Code:-

```
void home() {
    // Triangle
    line(100,150, 160,80);
    line(160,80,220,150);
    line(220,150,100,150);

    // parallelogram
    line(160,80,420,80);
    line(420,80,480,150);
    line(480,150,220,150);

    //rectangle
    line(100,150,100,350);
    line(100,350,220,350);
    line(220,350,220,150);

    //rectanlge
    line(480,150,480,350);
    line(480,350,220,350);

    //door
    line(120,350,120,200);
    line(120,200,200,200);
    line(200,200,200,350);

    //window
    line(260,200,440,200);
    line(440,200,440,280);
    line(440,280,260,280);
    line(260,280,260,200);

    setfillstyle(9, 6);
    floodfill(121,201,WHITE);
    setfillstyle(10, 7);
    floodfill(261,201,WHITE);
    setfillstyle(11,3);
    floodfill(151,149,WHITE);
    floodfill(221,151,WHITE);
    floodfill(151,151,WHITE);
    floodfill(221,149,WHITE);
}
```

Output:-

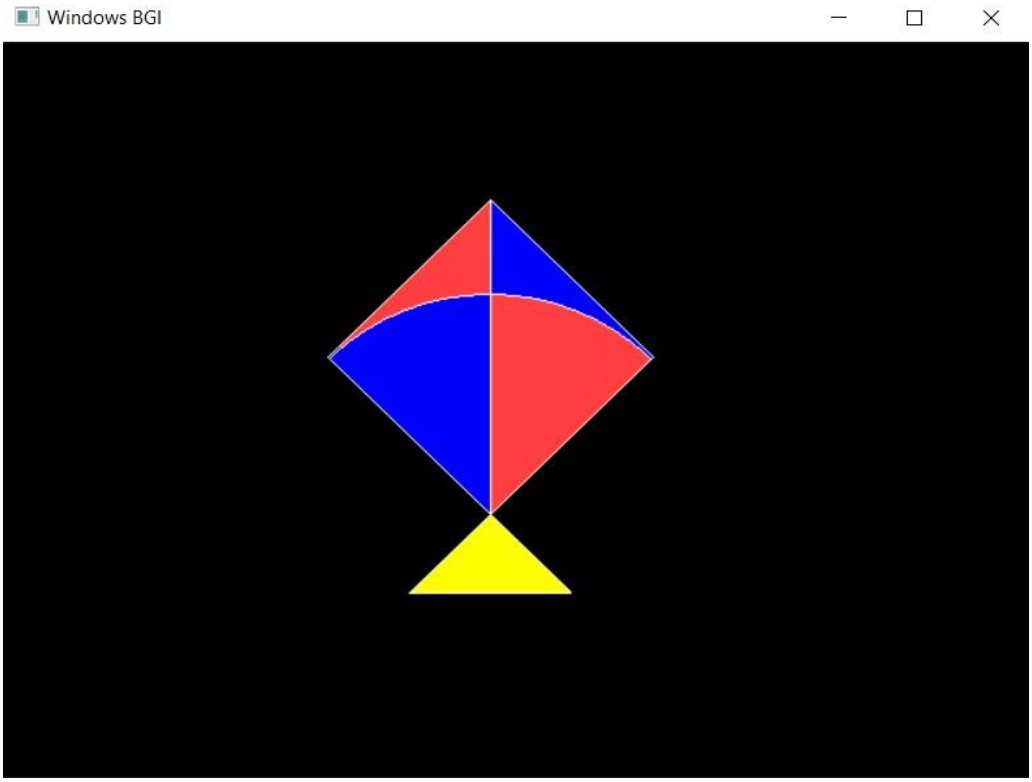
2. Write a program to draw a Kite and color it using pre-defined functions of graphics.h.

Code:-

```
void kite() {
    line(200,200,300,100);
    line(300,100,400,200);
    line(400,200,300,300);
    line(300,300,200,200);
    line(300,100,300,300);

    arc(300,300,45,135,140);
    setfillstyle(SOLID_FILL,BLUE);

    floodfill(301,105,WHITE);
    setfillstyle(SOLID_FILL,LIGHTRED);

    floodfill(299,105,WHITE);
    setfillstyle(SOLID_FILL,BLUE);
```

```
    floodfill(299,275,WHITE);
    setfillstyle(SOLID_FILL,LIGHTRED);
    floodfill(301,275,WHITE);

    line(300,300,250,350);
    line(250,350,350,350);
    line(300,300,350,350);
    setfillstyle(SOLID_FILL,YELLOW);
    floodfill(300,310,WHITE);
}
```

Output:-



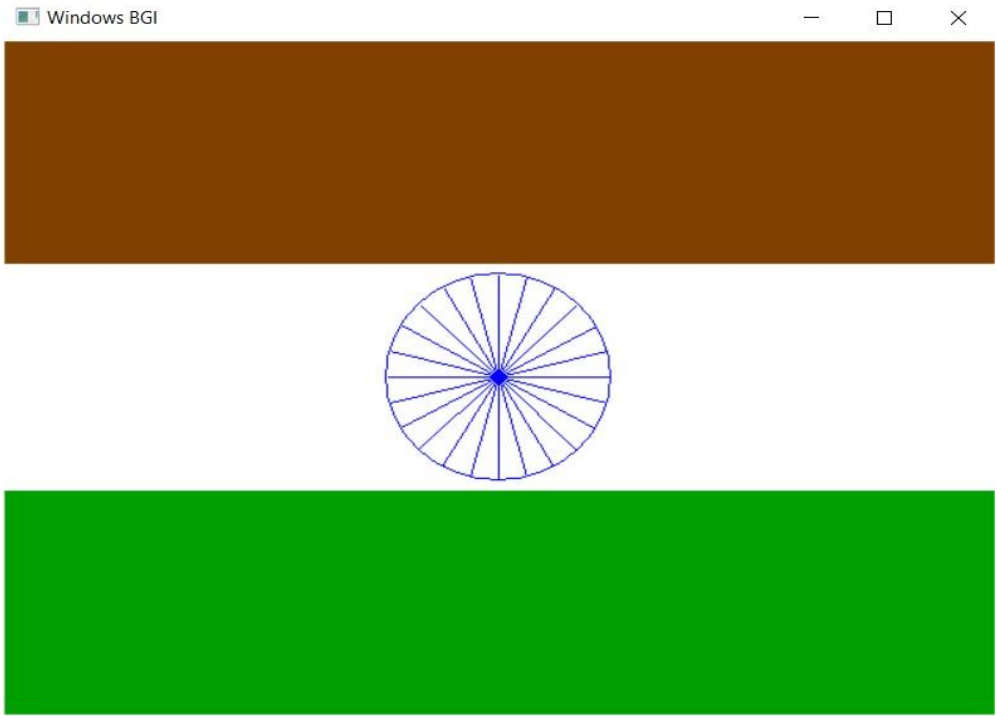
3. Write a program for drawing India's National Flag and Color it properly using pre-defined functions of graphics.h.

Code:-

```
void flag() {
    int maxx = getmaxx();
    int maxy = getmaxy();

    rectangle(0,0,maxx,maxy/3);
    rectangle(0,maxy/3,maxx,2*maxy/3);
```

```
    rectangle(0,2*maxy/3,maxx,maxy);

    setfillstyle(SOLID_FILL,BROWN);
    floodfill(1,1,WHITE);

    setfillstyle(SOLID_FILL,WHITE);
    floodfill(maxx/2,maxy/2,WHITE);

    setfillstyle(SOLID_FILL,GREEN);
    floodfill(maxx/2,2*maxy/3+5,WHITE);

    setcolor(BLUE);
    int a = maxx/2, b = maxy/2,r = maxy/6 - 5;
    circle(a,b, maxy/6 -5);

    for(int i = 0;i<=360;i += 15) {
        int tx = r*cos(i*3.14/180);
        int ty = r*sin(i*3.14/180);
        line(a,b,a+tx,b - ty);
    }
}
```

Output:-

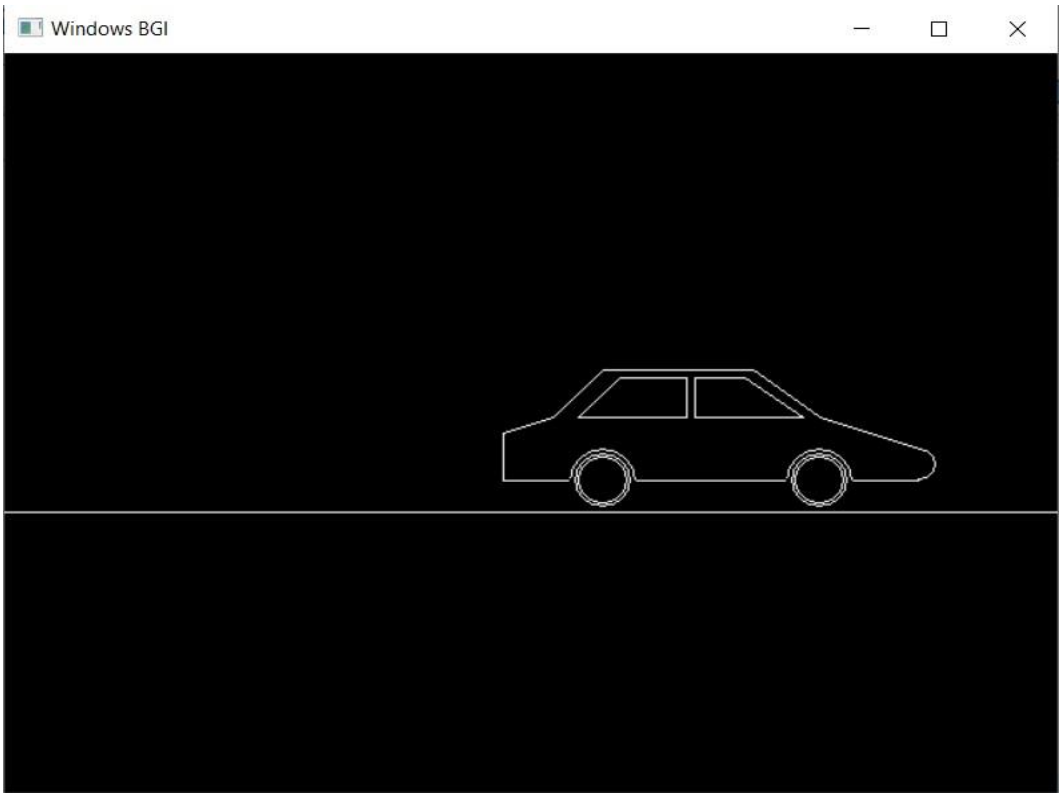


4. Write a program for displaying a Moving Car using pre-defined functions of graphics.h.

Code:-

```
void movingcar() {
    for(int i = 0;i<250;i++) {

        cleardevice();
        line(0,290,639,290);
        line(50 + i,270,90 + i,270);
        arc(110 + i,270,0,180,20);
        line(130 + i,270,220 + i,270);
        arc(240 + i,270,0,180,20);
        line(260 + i,270,300 + i,270);
        arc(300 + i,260,270,90,10);
        line(300 + i,250,240 + i,230);
        line(240 + i,230,200 + i,200);
        line(200 + i,200,110 + i,200);
        line(110 + i,200,80 + i,230);
        line(80 + i,230,50 + i,240);
        line(50 + i,240,50 + i,270);

        line(165 + i,205,165 + i,230);
        line(165 + i,230,230 + i,230);
        line(230 + i,230,195 + i,205);
        line(195 + i,205,165 + i,205);

        line(160 + i,205,160 + i,230);
        line(160 + i,230,95 + i,230);
        line(95 + i,230,120 + i,205);
        line(120 + i,205,160 + i,205);

        circle(110 + i,270,17);
        circle(240 + i,270,17);

        circle(110 + i,270,15);
        circle(240 + i,270,15);
        delay(10);
    }
}
```

Output:-



5. Write a menu driven program for following line drawing algorithms.
    I. DDA Algorithm
    II. Bresenham's Line Algorithm.

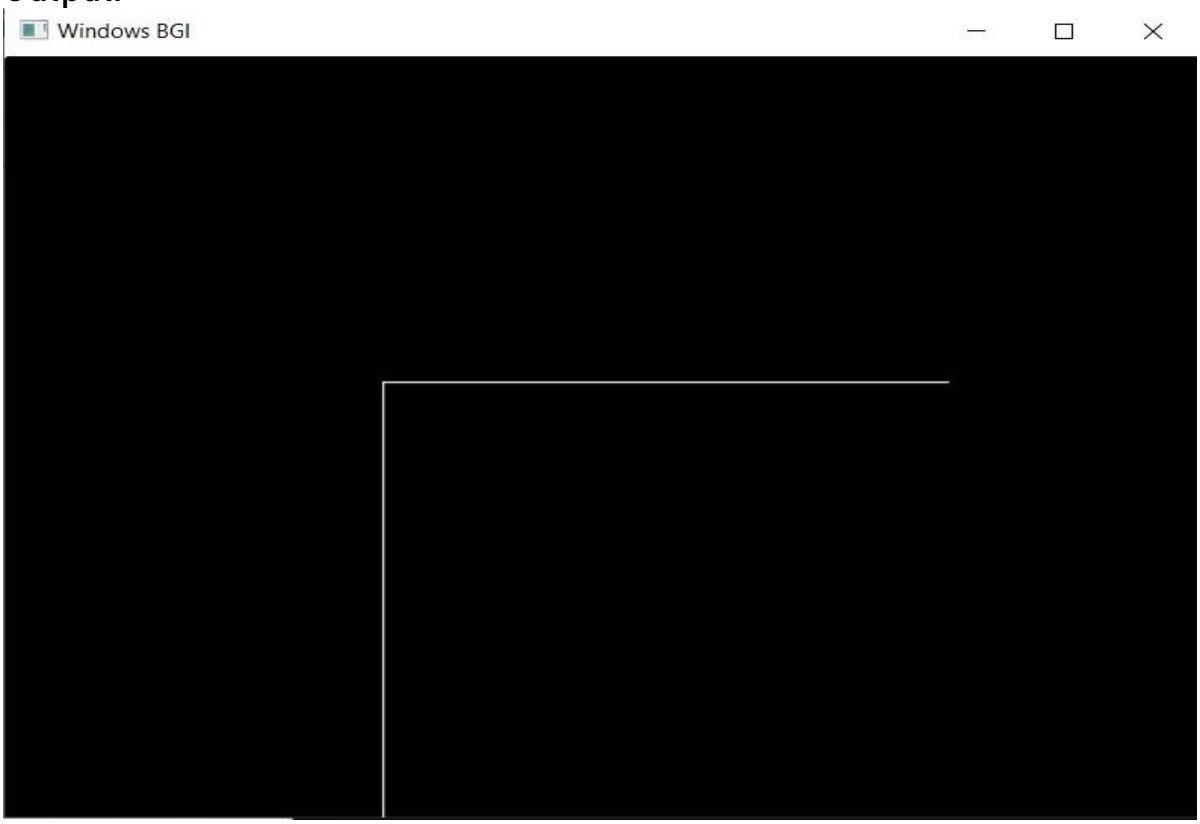
Code:-

```
void dda(int x0, int y0, int x1, int y1) {
    int i;
    float x,y,dx,dy, steps;
    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,WHITE);
        x += dx;
        y += dy;
        i=i+1;
    }
}

void bresenham (int x0, int y0, int x1, int y1)  {
    int dx, dy, p, x, y;
    dx=x1-x0;
    dy=y1-y0;
    x=x0;
    y=y0;
    p=2*dy-dx;
    while(x<x1) {
        if(p>=0) {
            putpixel(x,y,WHITE);
            y=y+1;
            p=p+2*dy-2*dx;
        }
        else {
            putpixel(x,y,WHITE);
            p=p+2*dy;
        }
        x=x+1;
    }
}
void linedrawing() {
    while(1) {
        printf("1 for DDA Algorithm \n");
        printf("2 for Bresenham Algorithm \n");
        printf("3 for Exit \n");
        int d;
        scanf("%d",&d);
        if(d==1 || d==2) {
            int x0,y0,x1,y1;
            printf("Enter x0,y0, x1,y1 space separated\n");
            scanf("%d %d %d %d",&x0,&y0,&x1,&y1);

            if(d==1) {
                dda(x0,y0,x1,y1);
            } else {
                bresenham(x0,y0,x1,y1);
            }
```

```
            getch();
        } else {
            break;
        }
    }
}
```

Output:-




```
E:\Asem6\cg\practical\Assignment3\Project1.exe
1 for DDA Algorithm
2 for Bresenham Algorithm
3 for Exit
2
Enter x0,y0, x1,y1 space separated
200 200 500 200
1 for DDA Algorithm
2 for Bresenham Algorithm
3 for Exit
1
Enter x0,y0, x1,y1 space separated
200 200 200 500
1 for DDA Algorithm
2 for Bresenham Algorithm
3 for Exit
3

--------------------------------
Process exited after 71.91 seconds with return value 0
Press any key to continue . . .
```