

PRACTICAL 5:

AIM: Write a Program to draw an Ellipse using Midpoint Ellipse Algorithm.

Source Code:

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

void main() {
    /* request auto detection */
    int gdriver = DETECT, gmode, err;
    long midx, midy, xradius, yradius;
    long xrad2, yrad2, twoxrad2, twoyrad2;
    long x, y, dp, dpx, dpy;

    /* initialize graphic mode */
    initgraph(&gdriver, &gmode, "C:/TURBOC3/BGI");
    err = graphresult();

    /* x axis radius and y axis radius of ellipse */
    xradius = 100, yradius = 50;

    /* finding the center postion to draw ellipse */
    midx = getmaxx() / 2;
    midy = getmaxy() / 2;

    xrad2 = xradius * xradius;
    yrad2 = yradius * yradius;

    twoxrad2 = 2 * xrad2;
    twoyrad2 = 2 * yrad2;
    x = dpx = 0;
    y = yradius;
    dpy = twoxrad2 * y;

    putpixel(midx + x, midy + y, WHITE);
    putpixel(midx - x, midy + y, WHITE);
    putpixel(midx + x, midy - y, WHITE);
    putpixel(midx - x, midy - y, WHITE);

    dp = (long) (0.5 + yrad2 - (xrad2 * yradius) + (0.25 * xrad2));
```

```

while (dpx < dpy) {
    x = x + 1;
    dpx = dpx + twoyrad2;
    if (dp < 0) {
        dp = dp + yrad2 + dpx;
    } else {
        y = y - 1;
        dpy = dpy - twoxrad2;
        dp = dp + yrad2 + dpx - dpy;
    }

    /* plotting points in y-axis(top/bottom) */
    putpixel(midx + x, midy + y, WHITE);
    putpixel(midx - x, midy + y, WHITE);
    putpixel(midx + x, midy - y, WHITE);
    putpixel(midx - x, midy - y, WHITE);
    delay(50);
}

delay(50);

dp = (long)(0.5 + yrad2 * (x + 0.5) * (x + 0.5) +
           xrad2 * (y - 1) * (y - 1) - xrad2 * yrad2);

while (y > 0) {
    y = y - 1;
    dpy = dpy - twoxrad2;

    if (dp > 0) {
        dp = dp + xrad2 - dpy;
    } else {
        x = x + 1;
        dpx = dpx + twoyrad2;
        dp = dp + xrad2 - dpy + dpx;
    }

    /* plotting points at x-axis(left/right) */
    putpixel(midx + x, midy + y, WHITE);
    putpixel(midx - x, midy + y, WHITE);
    putpixel(midx + x, midy - y, WHITE);
    putpixel(midx - x, midy - y, WHITE);
    delay(50);
}
closegraph();
getch();
}

```

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Output:

