TUGAS INDIVIDU MATA KULIAH GRAFIKA KOMPUTER

"Implementasi Algoritma Brasenham dan Midpoint untuk Menggambar Lingkaran"

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PROGRAM STUDI PENDIDIKAN TEKNOLOGI INFORMASI

JURUSAN PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM

**FAKULTAS KEGURUAN DAN ILMU PENDIDIKAN**

UNIVERSITAS LAMPUNG

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A. Lingkaran Bresenham

1. Tabel

x	y	d	x0+x, y0+y	x0-x, y0+y	x0+x, y0-y	x0-x, y0-y	x0+y, y0+x	x0-y, y0-x
0	9	-15	10+0, 10+5	10-0, 10+5	10+0, 10-5	10-0, 10-5	10+5, 10+0	10-5, 10-0
1	9	-5	10+1, 10+9	10-1, 10+9	10+1, 10-9	10-1, 10-9	10+9, 10+0	10-9, 10-0
2	9	9	10+2, 10+9	10-2, 10+9	10+2, 10-9	10-2, 10-9	10+9, 10+0	10-9, 10-0
3	8	-1	10+3, 10+8	10-3, 10+8	10+3, 10-8	10-3, 10-8	10+8, 10+0	10-8, 10-0
4	8	21	10+4, 10+8	10-4, 10+8	10+4, 10-8	10-4, 10-8	10+8, 10+0	10-8, 10-0
5	7	23	10+5, 10+7	10-5, 10-7	10+5, 10-7	10-5, 10-7	10+7, 10+0	10-7, 10-0
6	6	33	10+6, 10+6	10-6, 10-6	10+6, 10-6	10-6, 10-6	10+6, 10+0	10-6, 10-0
6	6							
7	5							
8	4							
8	3							

int x=0 d=3-2*r jika d < 0 maka y tetap

int y=0 d = d+4* x + 6

x selalu inc ++

jika d > 0 maka y--

d = d+4 (x-y)+10

2. Diagram
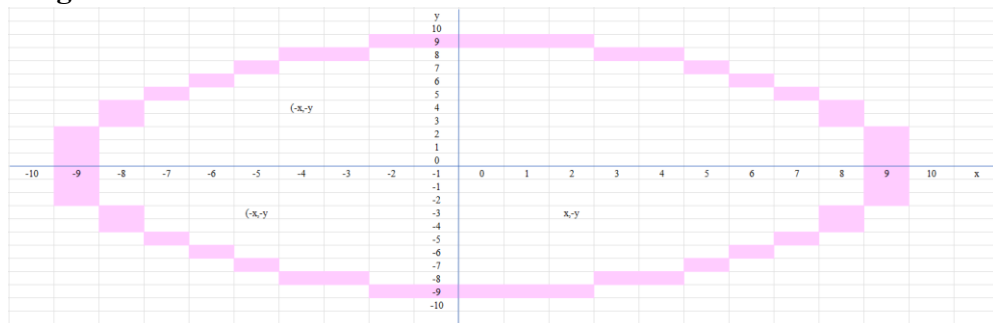
B. Lingkaran Midpoint

1. Tabel

x	y	p	x0+x, y0+y	x0-x, y0+y	x0+x, y0-y	x0-x, y0-y	x0+y, y0+x	x0-y, y0+x	x0+y, y0-x	x0-y, y0-x
0	9	-8	10+0, 10+5	10-0, 10+5	10+0, 10-5	10-0, 10-5	10+5, 10+0	10-5, 10+0	10+5, 10-0	10-5, 10-0
1	9	-5	10+1, 10+9	10-1, 10+9	10+1, 10-9	10-1, 10-9	10+9, 10+0	10-9, 10+1	10+9, 10-0	10-9, 10-0
2	9	0	10+2, 10+9	10-2, 10+9	10+2, 10-9	10-2, 10-9	10+9, 10+0	10-9, 10+2	10+9, 10-0	10-9, 10-0
3	8	-9	10+3, 10+8	10-3, 10+8	10+3, 10-8	10-3, 10-8	10+8, 10+0	10-8, 10+3	10+8, 10-0	10-8, 10-0
4	8	0	10+4, 10+8	10-4, 10+8	10+4, 10-8	10-4, 10-8	10+8, 10+0	10-8, 10+4	10+8, 10-0	10-8, 10-0
5	7	-3	10+5, 10+7	10-5, 10+7	10+5, 10-7	10-5, 10-7	10+7, 10+0	10-7, 10+5	10+7, 10-0	10-7, 10-0
6	7	10	10+6, 10+7	10-6, 10+7	10+6, 10-7	10-6, 10-7	10+7, 10+0	10-7, 10+6	10+7, 10-0	10-7, 10-0
7	6	13	10+7, 10+6	10-7, 10+6	10+7, 10-6	10-7, 10-6	10+6, 10+0	10-6, 10+7	10+6, 10-0	10-6, 10-0
6	7									
7	6									
7	5									
8	4									
8	3									
9	2									
9	1									

jika p < 0 maka y tetap

p = 2*x +1

jika p > 0 maka y--

p = p+2* (x-y)+1

2. Diagram
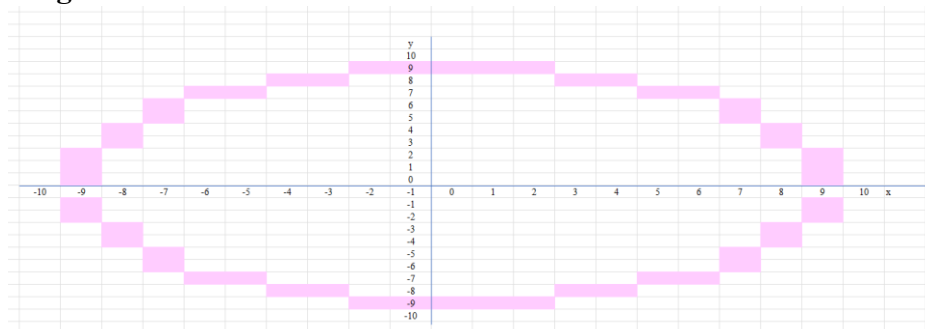
C. Code Program

```html
1   <!DOCTYPE html>
2   <html lang="en">
3   <head>
4     <meta charset="UTF-8" />
5     <meta name="viewport" content="width=device-width, initial-scale=1.0"/>
6     <title>Dinda Aulia Natasya_2413025066</title>
7     <style>
8       canvas {
9         border: 1px solid #000000;
10        margin: 10px;
11      }
12    </style>
13  </head>
14  <body>
15    <h1 align="center">LINGKARAN BRESENHAM DAN MIDPOINT</h1>
16
17    <label>X: <input type="number" id="x" value="150"></label>
18    <label>Y: <input type="number" id="y" value="150"></label>
19    <label>Radius: <input type="number" id="rad" value="50"></label>
20    <label>Warna: <input type="color" id="warna" value="#E4AB16"></label>
21    <button onclick="buatGambar()">Gambar Lingkaran</button>
22
23    <br/><br/>
24    <canvas id="myCanvas" width="300" height="300"></canvas>
25    <canvas id="midpoint" width="300" height="300"></canvas>
26
27    <script>
28      let canvas = document.getElementById("myCanvas");
29      let ctx = canvas.getContext("2d");
30
31      function titik(x, y, warna) {
32        ctx.fillStyle = warna;
33        ctx.fillRect(x, y, 1, 3);
34      }
35
36      function gambarTitikSimetris(x0, y0, x, y, warna) {
37        titik(x0 + x, y0 + y, warna);
38        titik(x0 - x, y0 + y, warna);
39        titik(x0 + x, y0 - y, warna);
40        titik(x0 - x, y0 - y, warna);
41        titik(x0 + y, y0 + x, warna);
42        titik(x0 - y, y0 + x, warna);
43        titik(x0 + y, y0 - x, warna);
44        titik(x0 - y, y0 - x, warna);
45      }
46
47      function linkBre(x0, y0, r, warna) {
48        var d = 3 - 2 * r;
49        var x = 0, y = r;
50
51        while (x <= y) {
52          gambarTitikSimetris(x0, y0, x, y, warna);
53          if (d <= 0) {
54            d = d + 4 * x + 6;
55          } else {
56            d = d + 4 * (x - y) + 10;
57            y--;
58          }
59          x++;
60        }
61      }
62
63      function buatGambar() {
64        ctx.clearRect(0, 0, canvas.width, canvas.height);
65        ctxmidpoint.clearRect(0, 0, midpoint.width, midpoint.height);
66
67        let x0 = parseInt(document.getElementById("x").value);
68        let y0 = parseInt(document.getElementById("y").value);
69        let r = parseInt(document.getElementById("rad").value);
70        let warna = document.getElementById("warna").value;
71
72        linkBre(x0, y0, r, warna);
73        drawmidpoint(x0, y0, r);
74      }
75
76      let midpoint = document.getElementById("midpoint");
77      let ctxmidpoint = midpoint.getContext("2d");
78
79      function drawmidpoint(x0, y0, r) {
80        let x = r;
```

```
 80          let x = r;
 81          let y = 0;
 82          let d = r - 1;
 83
 84          while (x >= y) {
 85            ctxmidpoint.fillRect(x0 + x, y0 + y, 1, 1);
 86            ctxmidpoint.fillRect(x0 - x, y0 + y, 1, 1);
 87            ctxmidpoint.fillRect(x0 + x, y0 - y, 1, 1);
 88            ctxmidpoint.fillRect(x0 - x, y0 - y, 1, 1);
 89            ctxmidpoint.fillRect(x0 + y, y0 + x, 1, 1);
 90            ctxmidpoint.fillRect(x0 - y, y0 + x, 1, 1);
 91            ctxmidpoint.fillRect(x0 + y, y0 - x, 1, 1);
 92            ctxmidpoint.fillRect(x0 - y, y0 - x, 1, 1);
 93
 94            if (d >= 2 * y) {
 95              d -= 2 * y + 1;
 96              y++;
 97            } else if (d < 2 * (r - x)) {
 98              d += 2 * x - 1;
 99              x--;
100            } else {
101              d += 2 * (x - y - 1);
102              x--;
103              y++;
104            }
105          }
106        }
107      </script>
108    </body>
109  </html>
```

D. Output

LINGKARAN BRESENHAM DAN MIDPOINT

X: [150] Y: [150] Radius: [50] Warna: [▮] Gambar Lingkaran