

Nama : M. Abdul Adhim

Kelas : C

NPM : 2217051030

MatKul : Grafikom – Tugas Algoritma Garis

Algoritma Pembentukan Garis Bersenham dan Digital Differential Analyzer

A. Kode Html

```
<!DOCTYPE html>
<html lang="id">
<head>
  <meta charset="UTF-8">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Algoritma DDA dan Bersenham</title>
</head>
<body>
  <script src="script.js"></script>
</body>
</html>
```

B. Kode JavaScript

```
// Algoritma Bresenham
function drawBresenhamLine(x1, y1, x2, y2, ctx) {
  let dx = Math.abs(x2 - x1);
  let dy = Math.abs(y2 - y1);
  let sx = (x1 < x2) ? 1 : -1;
  let sy = (y1 < y2) ? 1 : -1;
  let err = dx - dy;

  while (true) {
    ctx.fillRect(x1, y1, 1, 1);
    if (x1 === x2 && y1 === y2) break;
    let e2 = 2 * err;
    if (e2 > -dy) { err -= dy; x1 += sx; }
    if (e2 < dx) { err += dx; y1 += sy; }
  }
}

// Algoritma DDA (Digital Differential Analyzer)
function drawDDALine(x1, y1, x2, y2, ctx) {
  let dx = x2 - x1;
  let dy = y2 - y1;
  let steps = Math.max(Math.abs(dx), Math.abs(dy));
  let xInc = dx / steps;
  let yInc = dy / steps;
  let x = x1, y = y1;

  for (let i = 0; i <= steps; i++) {
    ctx.fillRect(Math.round(x), Math.round(y), 1, 1);
    x += xInc;
    y += yInc;
  }
}
```

```
// Menampilkannya pada Browser
window.onload = function() {
    let container = document.createElement("div");
    container.style.display = "flex";
    container.style.gap = "20px";
    document.body.appendChild(container);

    function createCanvas(title) {
        let canvasWrapper = document.createElement("div");
        let titleLabel = document.createElement("h4");
        titleLabel.innerText = title;
        let canvas = document.createElement("canvas");
        canvas.width = 250;
        canvas.height = 250;
        canvas.style.background = "#d3d3d3";
        canvasWrapper.appendChild(titleLabel);
        canvasWrapper.appendChild(canvas);
        container.appendChild(canvasWrapper);
        return canvas.getContext("2d");
    }

    // Teks Keterangan Nama + NPM
    let info = document.createElement("div");
    info.innerHTML = "<p>Nama: M. Abdul Adhim | NPM: 2217051030</p>";
    document.body.appendChild(info);

    // Algoritma Bresenham
    let ctxBresenham = createCanvas("Algoritma Bresenham");
    drawBresenhamLine(50, 50, 200, 200, ctxBresenham);

    // Canvas untuk Algoritma DDA (Digital Differential Analyzer)
    let ctxDDA = createCanvas("Algoritma DDA");
    drawDDALine(50, 50, 200, 200, ctxDDA);
};
```

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C. Hasil Running Kode Html dan JavaScript

