Bresenham Line Drawing Algorithm

April 2, 2025

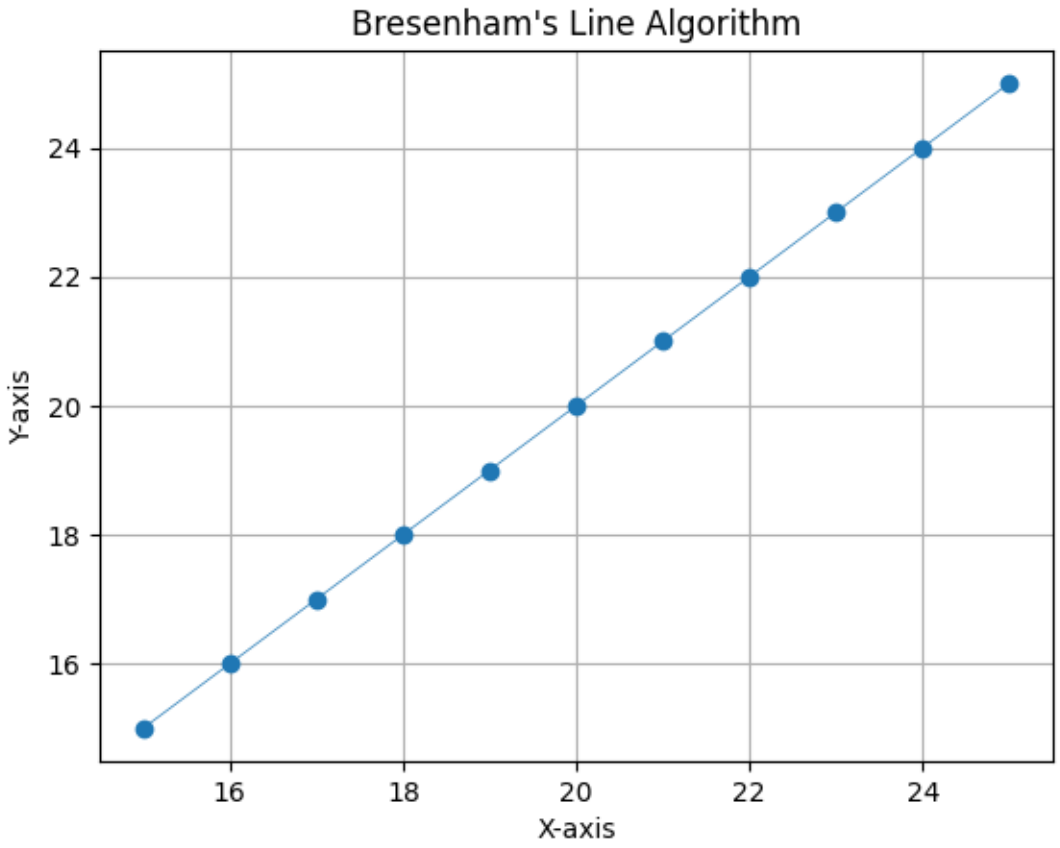
[1]:
```
import matplotlib.pyplot as plt
```

[2]:
```
def bresenham(x1, y1, x2, y2):
    points = []
    dx = abs(x2 - x1)
    dy = abs(y2 - y1)
    x, y = x1, y1
    sx = 1 if x1 < x2 else -1
    sy = 1 if y1 < y2 else -1
    err = dx - dy

    while True:
        points.append((x, y))
        if x == x2 and y == y2:
            break
        e2 = 2 * err
        if e2 > -dy:
            err -= dy
            x += sx
        if e2 < dx:
            err += dx
            y += sy

    return points
```

[3]:
```
x1, y1 = 15, 15
x2, y2 = 25, 25
points = bresenham(x1, y1, x2, y2)
```

[4]:
```
import matplotlib.pyplot as plt

x_coords, y_coords = zip(*points)
plt.plot(x_coords, y_coords, marker='o', linestyle='-', linewidth=0.5,␣
 ↪antialiased=True) # Modified
plt.xlabel("X-axis")
plt.ylabel("Y-axis")
plt.title("Bresenham's Line Algorithm")
plt.grid(True)
```

```
plt.show()
```


Bresenham's Line Algorithm
Y-axis
X-axis
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