DDA 2D FOR RAY CASTING

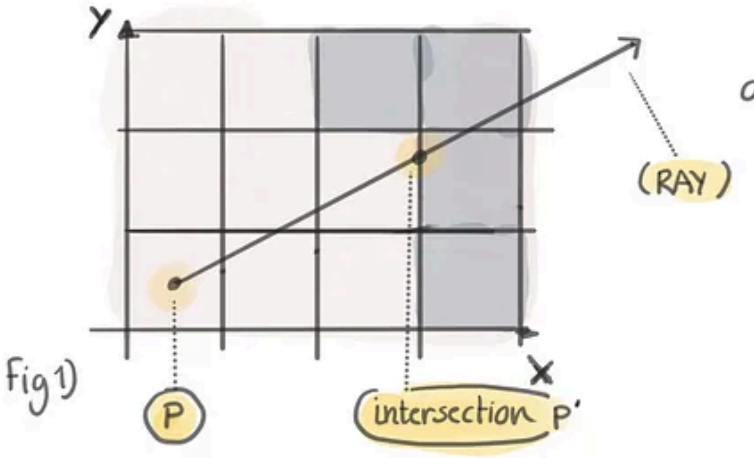


Fig 1)

Given player pos P and view direction D, find intersection P'.

RAY $R(t) = P + D(t)$, $\|D\| = 1$, $P, D \in \mathbb{R}^2$

Algorithm:

$$\Delta x = \frac{1}{D.x}$$

$$\Delta y = \frac{1}{D.y}$$

$\Delta x, \Delta y$: is pr unit distance, $>= 1$, indicates how far the ray must travel to go from one cell to another in that axis.

Based on ray direction

stepX = (D.X < 0) ? -1 : 1 } which way are we stepping

stepY = (D.Y < 0) ? -1 : 1 }

nextX = (D.X < 0) ? ⌈P.X⌉ + stepX : ⌊P.X⌋ + stepX } ⌈ ⌉ : ceil

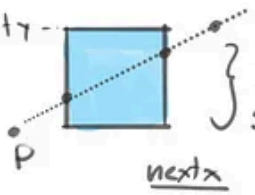
nextY = (D.Y < 0) ? ⌈P.Y⌉ + stepY : ⌊P.Y⌋ + stepY } ⌊ ⌋ : floor

initally next is potential next grid pos

to march the grid, find the next step by chosing the min distance :

xn = (nextX - p.x) · Δx

yn = (nexty - P.Y) · Δy



} in this case nx < ny so next.x is incremented.