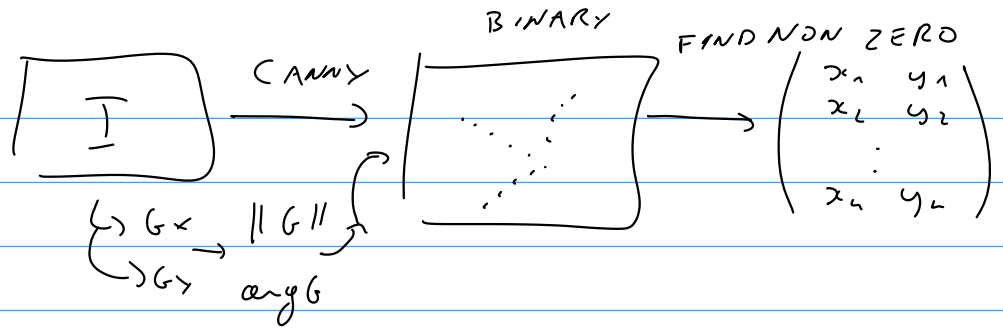


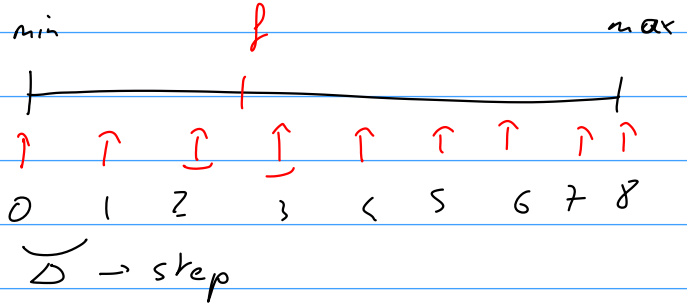
$$\begin{pmatrix} x_1 & y_1 \\ x_2 & y_2 \\ \vdots & \\ x_n & y_n \end{pmatrix}$$

$$\begin{pmatrix} a_1 & b_1 \\ \vdots & \\ a_k & b_k \end{pmatrix}$$

$y = a_1 x + b$

$f = 3.81$

$f_i = 5$



$$f_i = \text{round}\left(\frac{f - min}{\Delta}\right)$$

floor

ceil

$V[f_i]$ $i = 1$

$0 \leq f_i < size(V)$ pyc

$1 \leq f_i \leq size(V)$ matlab

$$f = min + f_i \Delta$$

$$(f_i - 1)\Delta$$

$$n_{step} = \frac{max - min}{\Delta} (+1)$$

acc = zeros(( ))

for (x_i, y_i) in POINTLIST:

  foreach value of (a, b)

    a_i = discr(a)

    b_i = discr(b)

    check if a_i and b_i is valid

    acc(a_i, b_i) += 1

$y = ax + b \rightarrow b = y - ax \quad a = \frac{y-b}{x}$

for b_i in $[\![0, n_b]\!]$

  $b = b_{min} + i\,\Delta_b$

  $a = \frac{y-b}{x}$

  a_i = discr(a)

  if $a_i \geq 0$ and $a_i < n$ ←

    acc(a_i, b_i) += 1

    acc(a_i, b_{i+1}) += 0.5) SMOOTHING

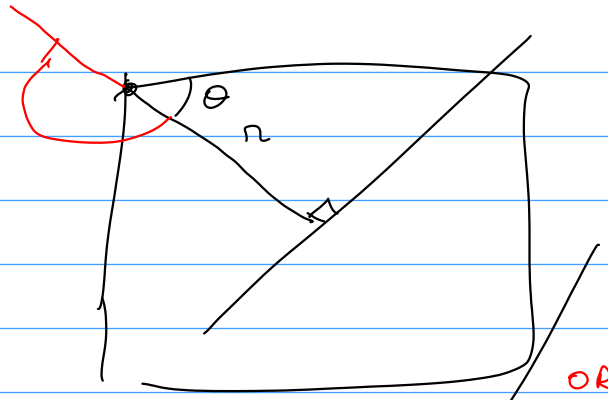
    acc(a_i, b_{i-1}) += 0.5)

$y = ax + b \quad (a, b) \quad a \in [0.5, 1.5] \quad n = 100$

$b = y - ax \quad \Delta = 0.01$

$b \in [-0.5, 0.5) \quad n = 100$

Acc = zeros((100, 100), dtype=int) $\quad \Delta = 0.01$



$\theta \in [0, 2\pi)$

$r \in [0, diag]$

OR

$\theta \in [0, \pi)$

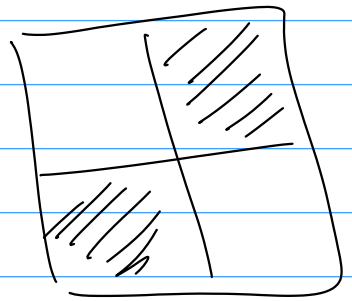
$r \in [0, diag]$

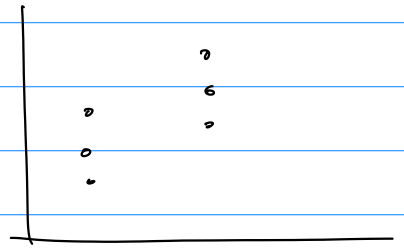
$\theta \in [0, 2\pi]$

$r \in [-diag, diag]$

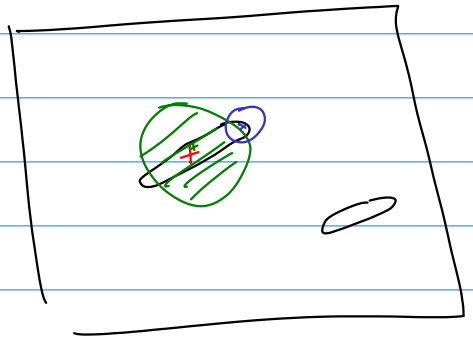
x, y

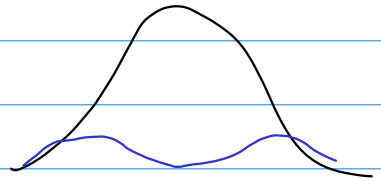
$r =$

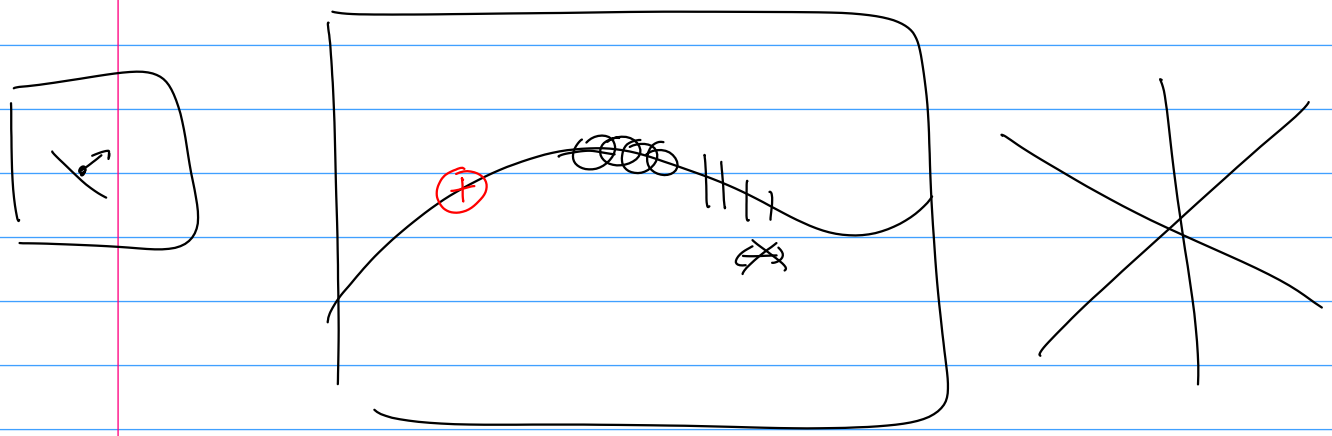




MULTIPLE PEAKS







$$ax + by + c = 0$$

n points

k bins $\qquad b = y - -ax$

2 dimensions $\rightarrow$ 1 free param $\rightarrow O(nk)$

TIME COMPLEXITY : nk^2

with grad $\rightarrow$ 0 free param $\rightarrow O(nk^0)$

d dim, $\rightarrow$ d' free dim $O(nk^{d'})$

SPACE COMPLEXITY $O(k^d)$

$y = ax + b \iff b = y - ax$

$(x - c_x)^2 + (y - c_y)^2 = r^2$

$(c_x - x)^2 + (c_y - y)^2 = r^2$