

Problem statement:

We are provided with a array containing coordinates in the 2D space as an input. Our job is to print the total k number of such points whose distance from the origin is closed and return them as an output

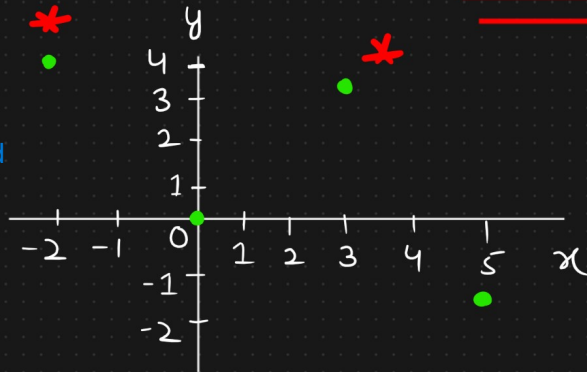
K closest Points To Origin

$$\text{Points} = \left[\begin{matrix} [3, 3] \\ x \quad y \end{matrix}, [5, -1], [-2, 4] \right]$$

$$k = 2$$

$$\text{Output} = \left[[3, 3], [-2, 4] \right]$$

$$\text{Origin} = (0, 0)$$



Distance measure

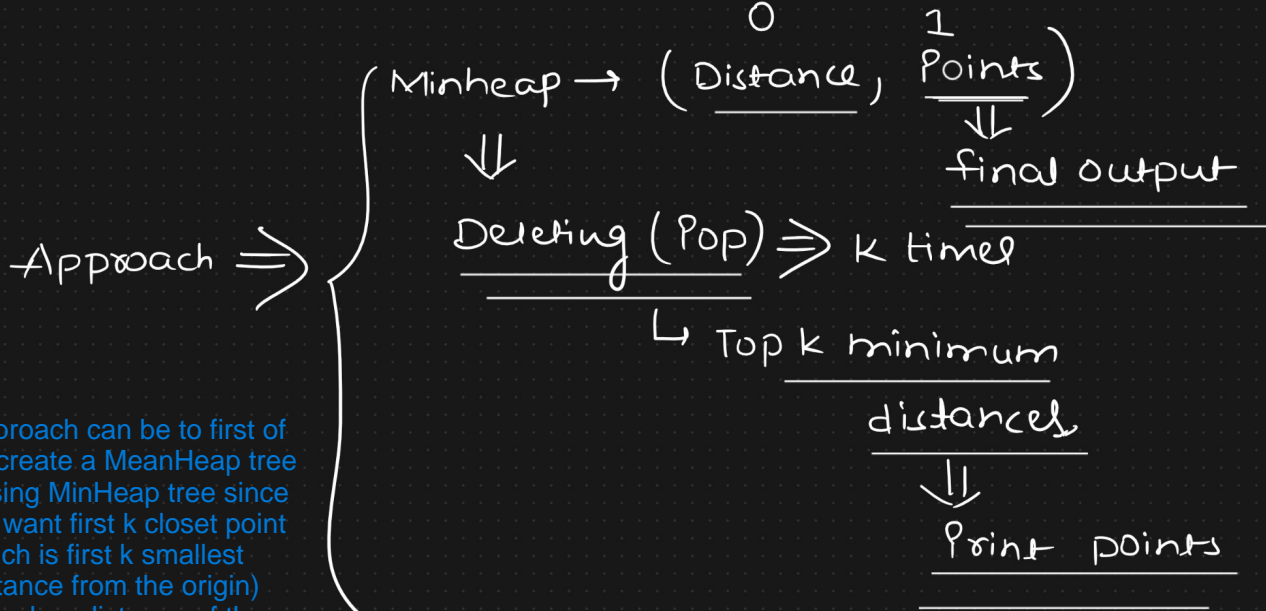
⇓
Euclidean

Distance

$$P_1(x_1, y_1) \quad P_2(x_2, y_2)$$

Standard $\Rightarrow \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Formula

$$\Rightarrow \sqrt{x_2^2 + y_2^2} \quad \text{Distance of an point from the origin}$$



Approach can be to first of all create a MinHeap tree (Using MinHeap tree since we want first k closet point which is first k smallest distance from the origin) based on distance of the respective points(provided as an input) from the origin.

And then perform the Delete operation k number of times which will pop the smallest element at root on one on one basis and then we will need to return the respective points of the smallest distance