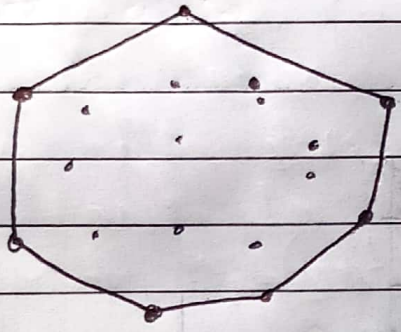
Q.1 Answer ⇒ Convex hull ⇒ Convex hull of a set Q of points, denoted by CH (Q) is the smallest convex polygon P for which each points in Q is either on the boundary of P or in its interior.



- The convex hull method uses the Hit and Miss transformation.
- For example, let the input image and the structuring element is shown as:

the step by step approach to the determination of the convex hull of the input image is given as;

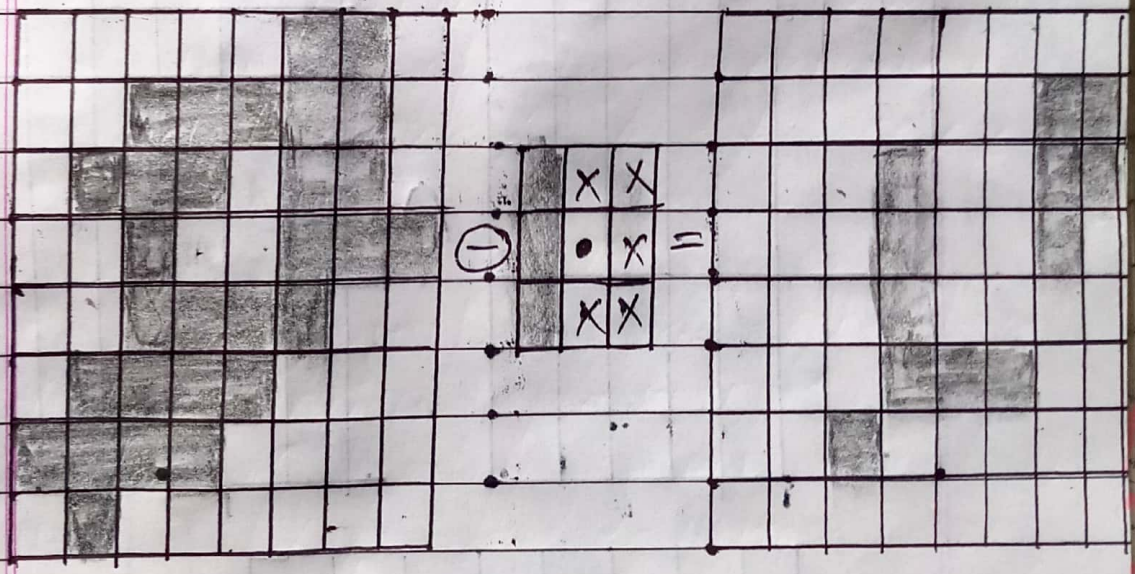
Step-1 → The value of $Y_1^1$ is determined using $Y_1^1 = HM(Y_0^1, B^1) \cup X$.

Step-2 → To find $HM(Y_0^1, B^1)$

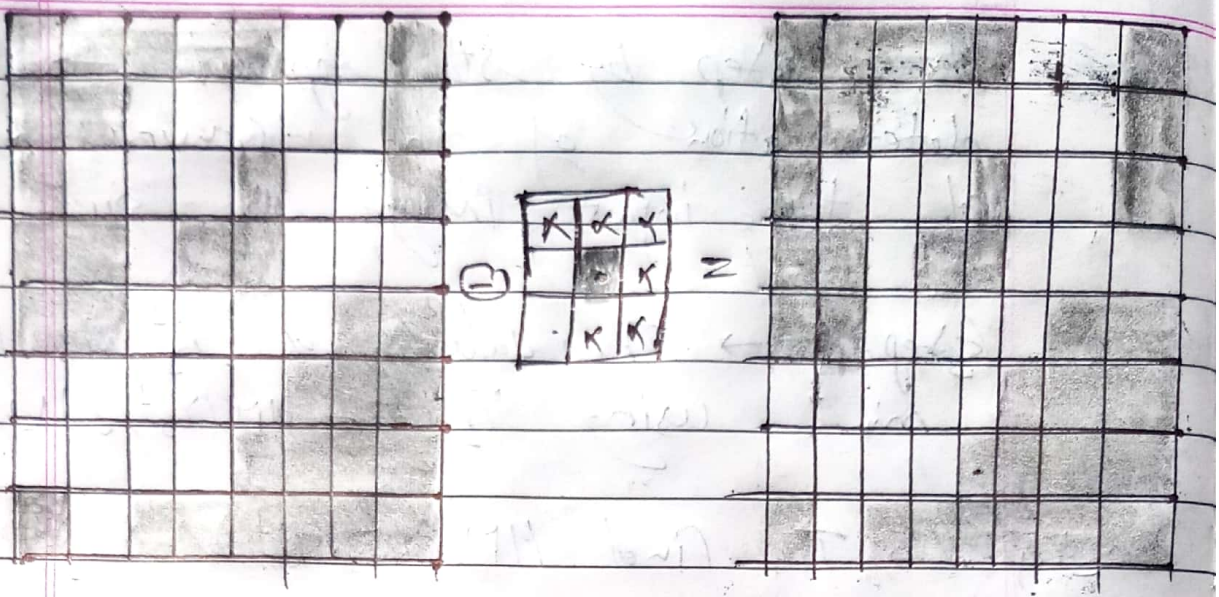
$$HM(Y_0^1, B^1) = (Y_0^1 \ominus B^1) \cap ((Y_0^1)^c \ominus (W - B^1))$$

we find

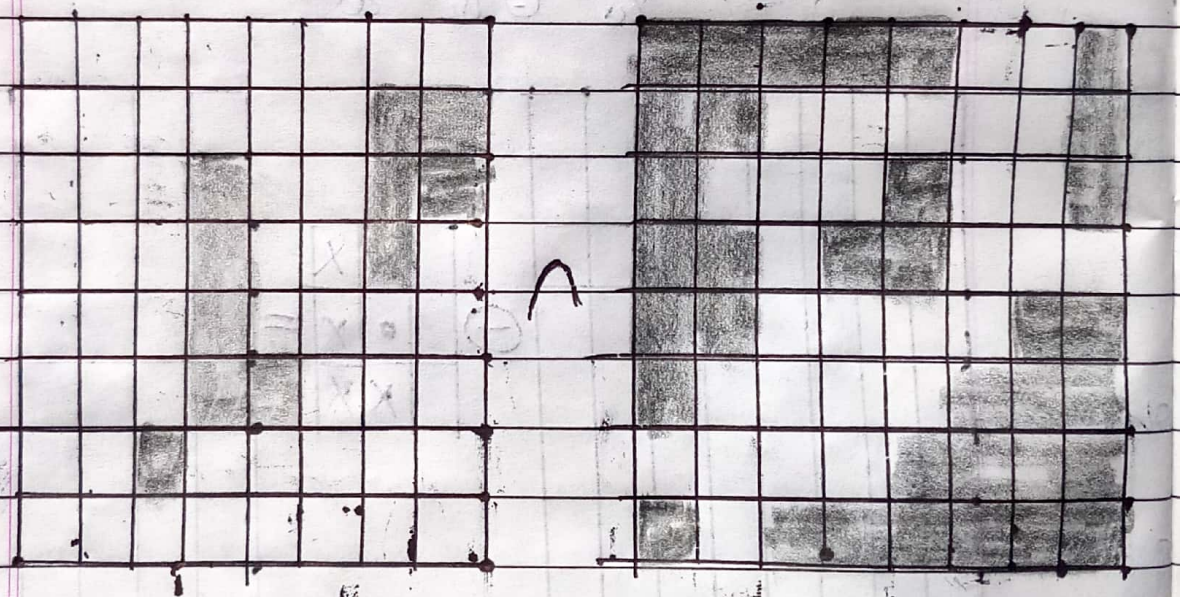
$Y_0^1 \ominus B^1$ as:

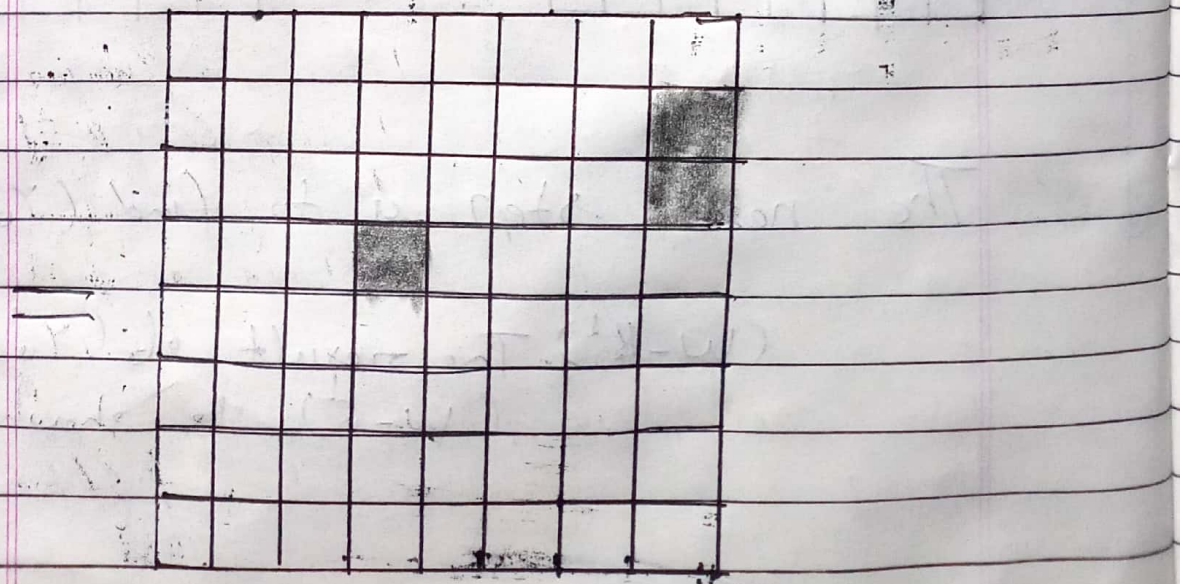


The next step is to find $(Y_0^1)^c \ominus (W - B^1)$. The result of $(Y_0^1)^c \ominus (W - B^1)$ is shown as:

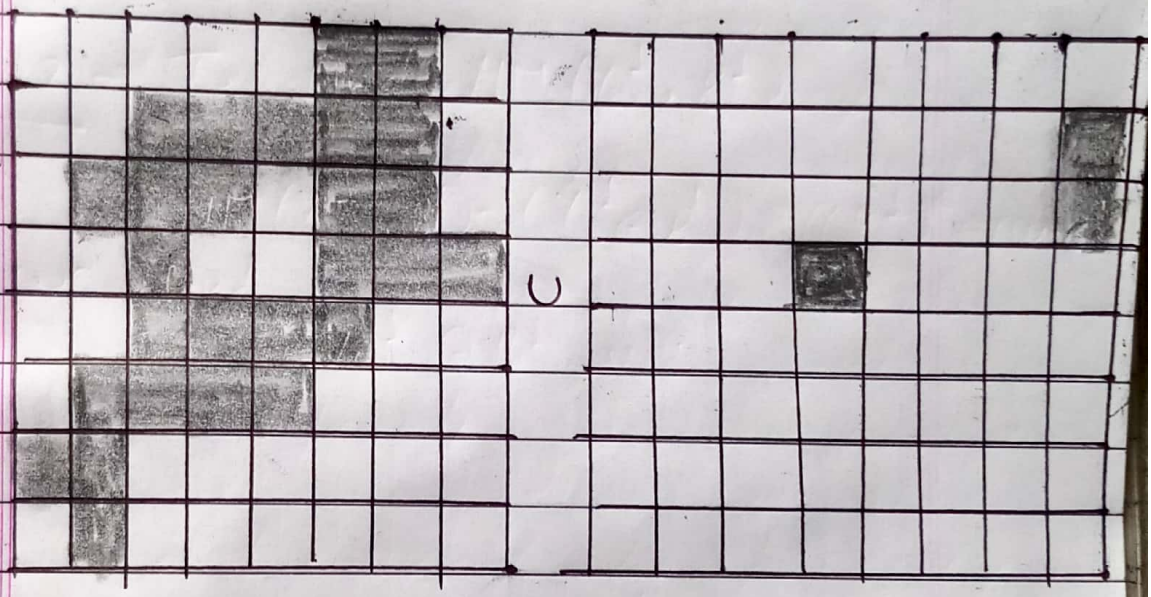


then we find the intersection of above two results as :→





Step 3 → The union of the input image with the result of obtained in step 2 will give the convex hull of the input image which is:



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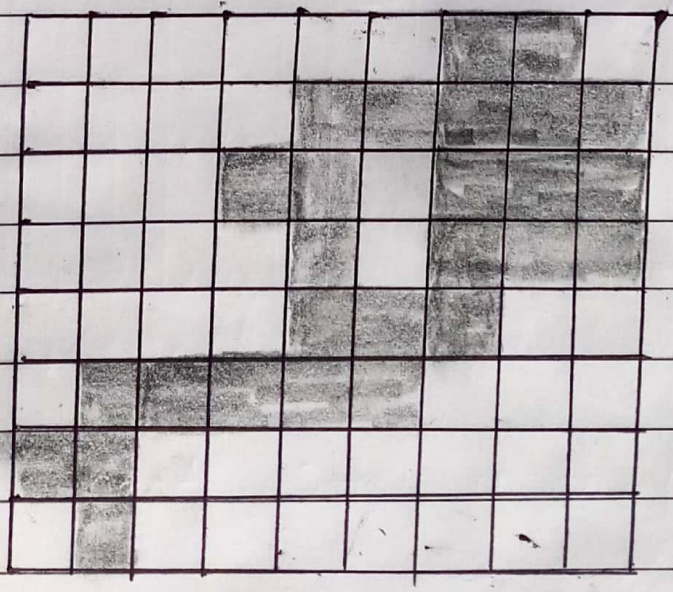

Ans