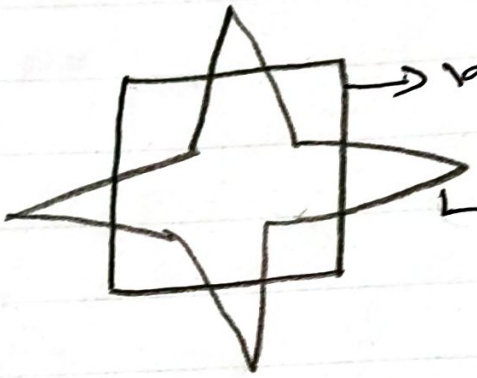
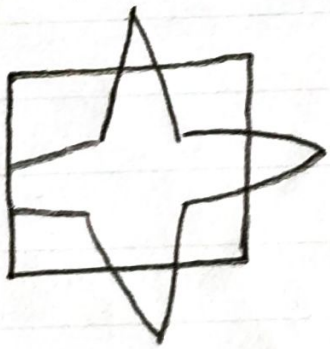
Sutherland - Hodgman Algorithm:

* The Sutherland - Hodgman algorithm is used for clipping polygons.
* In this algorithm, all the vertices of the polygon are clipped against each edge of the clipping window.

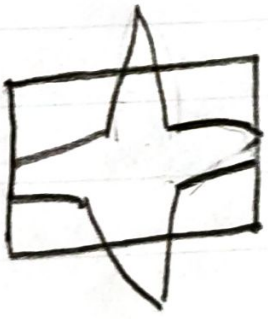


Steps for polygon clipping:

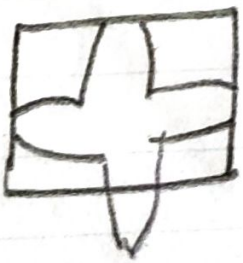
1. Left clip



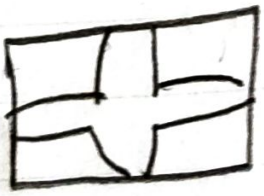
2. Right clip



3. Top clip

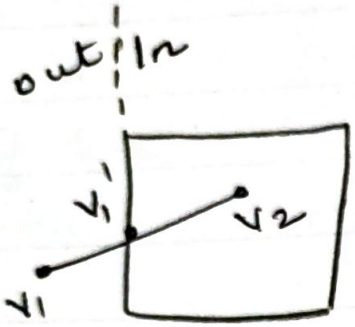


4. Bottom clip



Follow 4 cases:

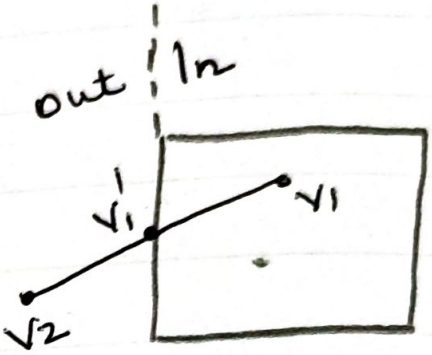
case : 1



output:

Move out → in
(V1' V2) consider the points are

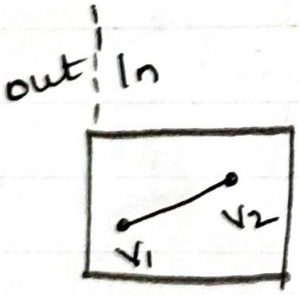
case : 2



output:

Move In → out
(V1')

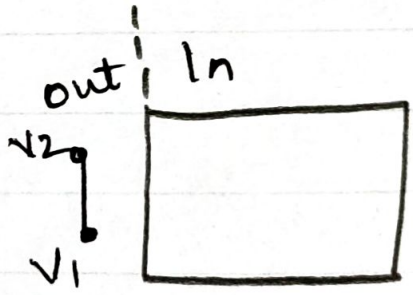
case : 3



output:

Move In → In
V2

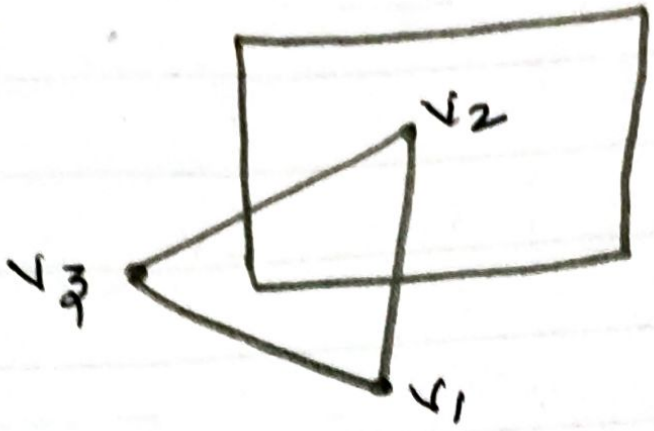
case : 4



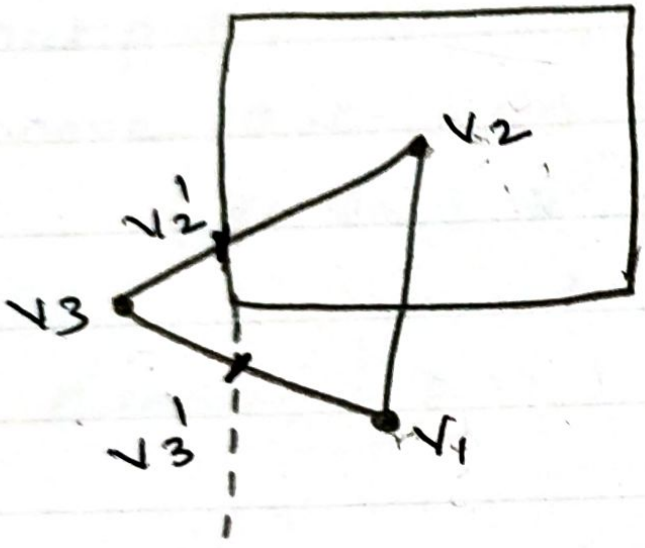
output:

Move out → out
NIL.
No need to consider any points.

Example:



case 1: Left clip.

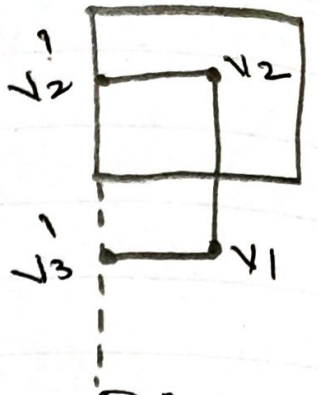


$V_1 V_2$ - In → In ⇒ V_2

$V_2 V_3$ - In → out ⇒ V_2'

$V_3 V_1$ - out → In ⇒ $V_3' V_1$

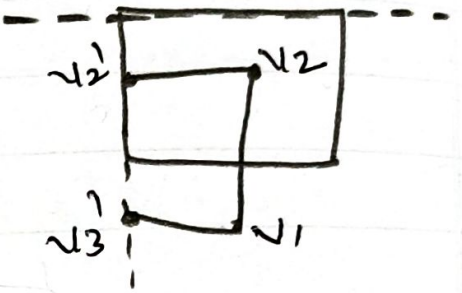
case 2. Right clip:



$V_1 V_2$ – V_2 (Inside)
$V_2 V_2'$ – V_2' (Inside)
$V_2' V_3'$ – V_3' (Inside)
$V_3' V_1$ – V_1 (Inside)

No change after Right clip.

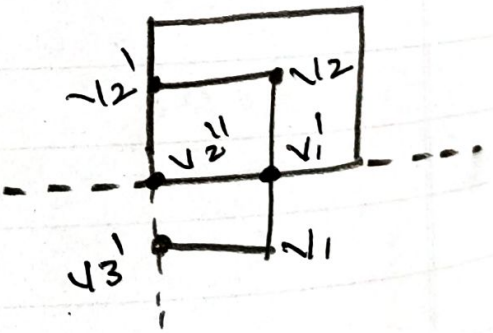
case 3. Top clip:



$V_1 V_2$ – V_2 (Inside)
$V_2 V_2'$ – V_2' (Inside)
$V_2' V_3'$ – V_3' (Inside)
$V_3' V_1$ – V_1 (Inside)

No change after Top clip.

case 4. Bottom clip.



$V_1 V_2$ – $V_1' V_2$ (out – in)
$V_2 V_2'$ – V_2' (Inside)
$V_2' V_3$ – V_2'' (In to out)
$V_3' V_1$ – (Out to out) NIL

Final output