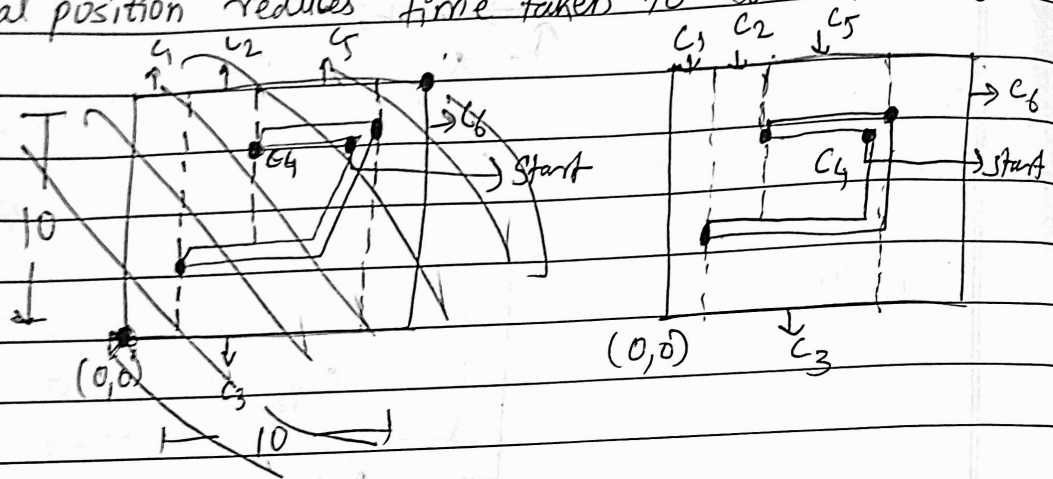
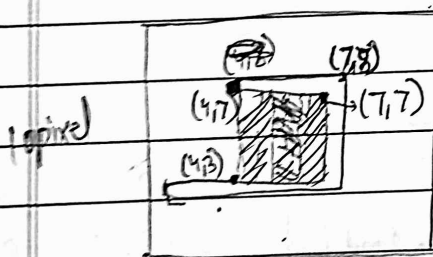


Q.2 → Last Using Moore decomposition, we tried to cover the previous whole area & total time for covering is 95secs.

Now, let's check if we try to optimizing our initial position reduces time taken to cover the cells



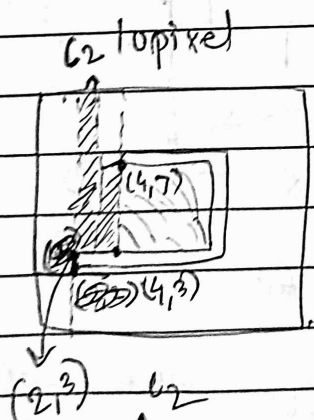
Our starting cell is 'C₄'.



For C₄,

Starting point : (7,7)
Critical point hit : (4,7)

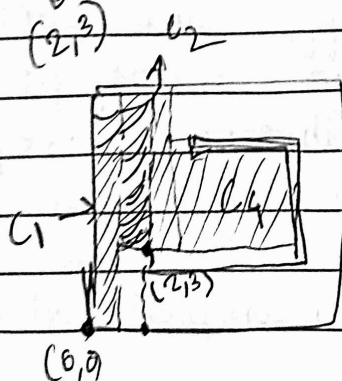
Total time to cover C₄ = 12 secs



For C₂

Starting point : (4,7)
Critical point hit : (2,3)

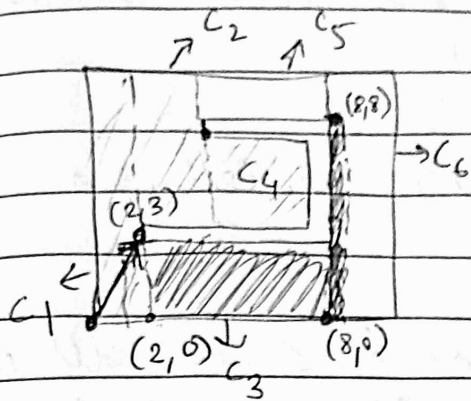
Total time to cover C₂ = 7 + 4 = 11 secs



For C₁,

Starting point : (2,3)
Critical point hit : (0,0)

Total time to cover C₁ = 17 secs

For C_3

Starting point: $(0,0)$
 travelling to critical point using
 Tangent Bug Algorithm,

Shortest path to go from,

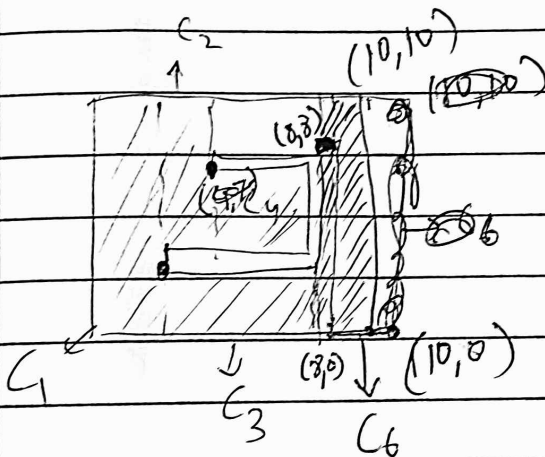
 $(0,0) \rightarrow (2,3)$

$$\Rightarrow \sqrt{13} = 6 \text{ steps} \Rightarrow 6 \text{ secs}$$

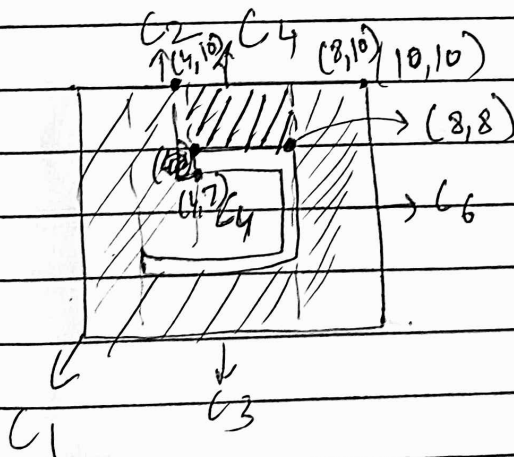
Start critical point hit = $(2,3)$ critical point hit = $(8,8)$ Total time to cover $C_3 =$

$$12 + 8$$

$$\Rightarrow 20 \text{ secs}$$

For C_6 ;start point: $(8,8)$ critical hit point: $(10,10)$ Total time to cover $C_6 =$

$$12 \text{ secs}$$

For C_4 ;start point: $(8,8)$ critical point hit: $(4,7)$ Total time to cover $C_4 =$

$$8 + 1 = 9 \text{ secs}$$

∴ Total Time taken to

cover C_1, C_2, \dots, C_6 .

$$\Rightarrow 9 + 12 + 20 + 6 + 17 + 11 + 12$$

$$\Rightarrow 87 \text{ secs}$$

So, compared to last one here starting from C_4 cell gives

$$T = 87$$

& initialization from C_1 cell gives

$$T = 95$$

\therefore We optimized time to cover all cells by changing initialization of robot to C_4 .