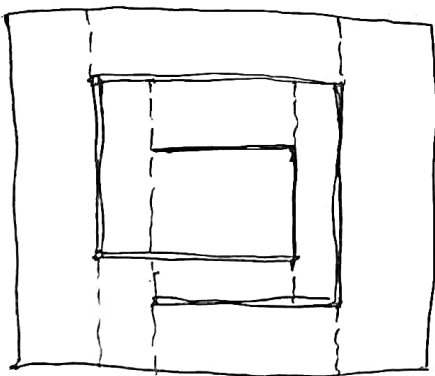Q 1. In trapezoidal Decomposition, number of cells depend upon the number of vertices of obstacles and the ~~area sha~~ environment.

For each vertex, cell partitioning ~~time~~ vertical line joins the perpendicular point (or line), in $O(n)$ time.

So for n vertex it will be $n \times n$
i.e, $O(n^2)$ time.

In Q.7 of assignment,

~~Let s be the starting point~~
There are 10 cells.
Let s_i be the entering point to each cell and f_i be the ~~fin~~ exiting point of each cell.

The time required to move across each ~~se~~ cell depends on the area of each cell.

Let $T_i(s_i, f_i, a_i)$ be the function

that calculates the time.

where T_i is the time

where $i = 1, 2, \cdots 10$. and a_i is the area of
each cell

$\therefore$ Total time required $= \displaystyle\sum_{i=1}^{10} T_i(s_i, f_i, a_i)$

Q.2.   Optimization by reducing the overlapping area.

From Q.1, as the obstacle is spiral,
turning the robot in only one direction will result
in spiral coverage which minimises the overlapp.

If not the retracing ~~causes~~ mor results
in more time to complete the whole coverage

Let T be the total time required to cover all cells.

T' be the minimised time.

Q.6. To avoid collision between two pursuers define a distance function between them such that a minimum distance is always maintained between them. If not define boundaries for each pursuers.