THADOMAL SHAHANI TSEC ENGINEERING COLLEGE

EXPERIMENT NO. 8

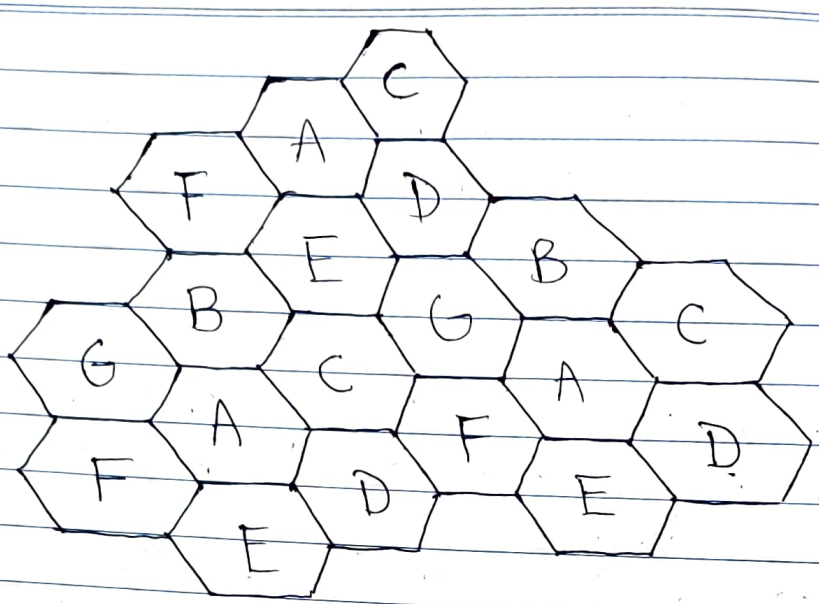
Aim :- Write a program to demonstrate Cellular frequency reuse.

Theory :-

Frequency Reuse is the scheme in which allocation and reuse of channels throughout a coverage region is done.
Each cellular base station is allocated a group of radio channels or Frequency sub-bands to be used within a small geographic area known as cell.
The shape of cell is Hexagonal.
The process of selecting and allocating the frequency sub-bands for all of the cellular base station within a system is called Frequency reuse or Frequency Planning.

Advantages of Frequency Reuse :

It improves Quality of Service (QoS).
In Frequency Reuse scheme, total bandwidth is divided into different sub-bands that are used by the cells.
Frequency reuse scheme allow operators to reuse the same frequencies at different cell sites.



Cell with same letter uses same set of channels group or frequencies sub-band.

To find the total number of channels allocated to a cell;

S = Total number of duplex channels available to use

k = Channels allocated to each cell ($k < S$)

N = Total number of cells or "Cluster Size"

Thus, $S = kN$

Frequency Reuse Factor = $1/N$

The value of N is calculated by following formula:

$N = I^2 + I * J + J^2$

where I, J : Positive integers indicating position of cell

N : Total number of cells / size of cluster

If a cluster is replicated or repeated M times, then Capacity, C, will be,

$$C = MkN = MS \qquad (\because S = kN)$$

Conclusion :-

Thus, implemented program to demonstrate frequency reuse (cellular) in mobile computing.