Practical - 1

Q1. Write a program in Scilab to Calculate the following

- **Frequency Reuse Distance (for a Given value of R)**
- **Frequency Reuse Factor**
- **Co-Channel Interference reduction factor (co-channel reuse ratio)**
- **Cellular System Capacity,**
- **S/I Ratio**

for a given variables. (Take Default Value of Cluster Size to be 7)

Ans.

1) Frequency Reuse distance (for a given value of R)
   Formula is, **D = R * SQRT(3*N)**

   Program code :

```
#Frequency reuse distance, D = R*sqrt(3*N)

function f = frd()
  cluster_size = 7;
  printf("Experiment no 1\n");
  printf("Program to calculate the frequency reuse distance\n");
  printf("Total number of channels : %d\n", cluster_size);
  r = input("Enter the value of R : ");
  result = r * sqrt(3*cluster_size);
  printf("Result : %f\n", result);
endfunction
```

   Output :

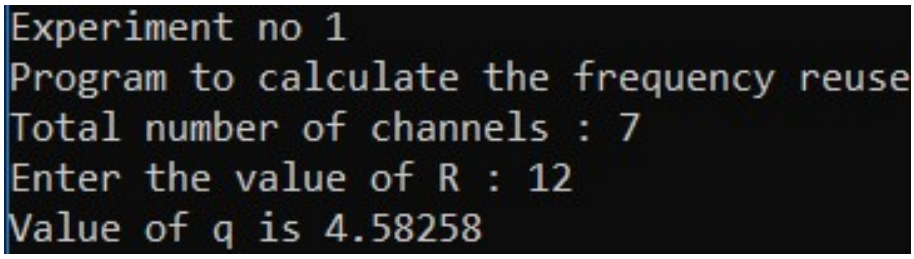
```
octave:12> frd
Experiment no 1
Program to calculate the frequency reuse dist
Total number of channels : 7
Enter the value of R : 12
Result : 54.990908
```

2) Frequency reuse factor
Formula is, **q = D / R**

Program code :

```
function f = frf()
 cluster_size = 7;
 printf("Experiment no 1\n");
 printf("Program to calculate the frequency reuse distance\n");
 printf("Total number of channels : %d\n", cluster_size);
 r = input("Enter the value of R : ");
 d = r * sqrt(3*cluster_size);
 q = d / r;
 printf(“Value of q is %d”, q);
endfunction
```

Output :

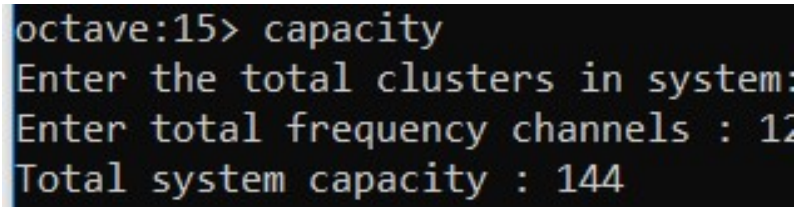


3) Cellular system capacity
Formula is, Capacity = Number of frequencies * total cluster size

Program code :

```
function f = capacity()
                cluster_size = input("Enter the total clusters in system: ");
                N = input("Enter total frequency channels : ");
                capacity = cluster_size * N;
                printf("Total system capacity : %d\n", capacity);
endfunction
```

Output :



4) Signal-interference ratio

Formula is, sir = (sqrt(3*N)^n)/i0

Program code

```
function f = sir()
                num_cells = input("Enter the number fo cells in thecluster : ");
                val_path_loss = input("Enter the value of path loss exponent :");
                interf_cell = input("Enter the numbeof Co-channel interfering cell : ");

                sir = (sqrt(3*num_cells)^ val_path_loss)/interf_cell;

                printf("SIR : %d\n", sir);

endfunction
```

Output