

```

1 clc;
2 clear all;
3 close all;
4
5 % Taking user input.
6
7 disp('Enter the data for the mu mimo single downlink system----');
8 NumOfTransmitAntennas1 = input('\nEnter the values for number of transmit antenna
Nt:');
9 NumOfReceiveAntennasPerUser1 = input('\nnumber of receive antennas per user Nr:');
10 VarianceSql = input('\nEnter the value for the variance square for the complex
gaussian zero mean random variables :');
11
12 % plotting SUMCAPACITY versus NUMBER OF USERS plot.
13
14 user2 = 0;
15 t1 = zeros(100,25);
16 t2 = zeros(100,25);
17 SumCapacityArr1 = 0;
18 SumCapacityArr2 = 0;
19 x = 1;
20 for SNRindB2=[0 10 20 30]
21     for K=1:25
22         for iteration = 1:1000
23             tic
24             [ SumCapacity1,SelectedReceiveAntenna1,SelectedUser1,DataStreams1 ] =
SuboptimalAlgorithm1Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,K,SNRindB2);
25             t1(iteration,K)= toc;
26             tic
27             [ SumCapacity2,SelectedReceiveAntenna2,SelectedUser2,DataStreams2 ] =
SuboptimalAlgorithm2Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,K,SNRindB2);
28             t2(iteration,K)= toc;
29         end
30     end
31     figure(x)
32     timeSA1 = sum(t1,1)/1000;
33     timeSA2 = sum(t2,1)/1000;
34     plot(1:25,timeSA1,'b-*','linewidth',2)
35     hold on
36     plot(1:25,timeSA2,'r-*','linewidth',2)
37     hold off;
38     title('TIME COMPLEXITY vs NUMBER OF USERS');
39     xlabel('NUMBER OF USERS');
40     ylabel('TIME COMPLEXITY');
41     legend('SA1','SA2','location','northwest')
42     x = x+1;
43 end
44 for K = [5 10 15 20]
45     for SNRindB2= 0:30

```

```
46         for iteration = 1:1000
47             tic
48             [ SumCapacity1,SelectedReceiveAntenna1,SelectedUser1,DataStreams1 ] ←
SuboptimalAlgorithm1Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,K,SNRindB2);
49             t1(iteration,SNRindB2+1)= toc;
50             tic
51             [ SumCapacity2,SelectedReceiveAntenna2,SelectedUser2,DataStreams2 ] ←
SuboptimalAlgorithm2Final( NumOfTransmitAntennas1,NumOfReceiveAntennasPerUser1,
VarianceSql,K,SNRindB2);
52             t2(iteration,SNRindB2+1)= toc;
53         end
54     end
55     figure(x)
56     timeSA1 = sum(t1,1)/1000;
57     timeSA2 = sum(t2,1)/1000;
58     plot(0:30,timeSA1,'b-*','linewidth',2)
59     hold on
60     plot(0:30,timeSA2,'r-*','linewidth',2)
61     hold off;
62     title('TIME COMPLEXITY vs SNR in dB');
63     xlabel('SNR in dB');
64     ylabel('TIME COMPLEXITY');
65     legend('SA1','SA2','location','northwest')
66     x = x+1;
67 end
```