Code :-

Code:

% Parameters

num\_users = 4; % Number of users

num\_bits =100; % Number of bits per user

SNR\_dB=10; % Signal-to-Noise Ratio (in dB)

% Generate random data for each user

User\_data=randi([0,1], num\_users, num\_bits);

% Generate spreading codes for each user

spreading\_codes = round(rand(num\_users, num\_bits))\*2-1; % BPSK

% Modulate data using spreading codes

spread\_data=user\_data.\* spreading\_codes;

% Add noise to the transmitted signal

SNR=10^(SNR\_dB/10); % Convert SNR from dB to linear scale

noise\_power=1/SNR; % Noise power

noise =sqrt(noise\_power/2)\* (randn(num\_users, num\_bits)+ li\*randn(num\_users,

num\_bits));

received\_signal= spread\_data + noise;

% Demodulate received signal using the same spreading codes

Demodulated\_data=received\_signal.\*spreading\_codes;

% Decode data for each user

Decoded\_data=sum(demodulated\_data, 2)>0;

% Display results

for i=1:num\_users

disp(['User', num2str(i), ' Original Data:', num2str(user\_data(I,:))]);

disp(['User', num2str(i), ' Decoded Data:', num2str(decoded\_data(i,:))]);

end

Output :-

Output:

User 1 Original Data: 1 1 1 1 0 1 1 1 0 1 0 0 1 1 1 1 1 0 1 0 0 1 0 1 1 0 0 10

1 0 1 0 0 1 1 0 0 1 0 1 0 1 1 1 1 1 1 0 1 1 0 1 0 0 0 1 0 1 0 0 101100

0 0 1 0 1 1 1 1 0 1 1 1 0 0 0 1 0 0 1 0 0 1 0 0 0 0 0 1 0 1 1 1 0

User 1 Decoded Data: 1

User 2 Original Data: 10

10

10 10 0 0 0 0 1 0 0 0 1 0 0 0 1 0 1 1 0 1 1 1 1

1 1 1 1 0 1 1 0 0 1 1 0 0 0 0 1 0 0 0 0 1 0 1 1 0 0 1 1 0 1 0 0 1 0 0 0 10

1 1 0 1 1 1 0 1 1 0 0 1 1 0 0 1 1 0 1 0 1 1 0 1 0 1 0 0 0 1000

User 2 Decoded Data: 1

User 3 Original Data: 0 0 0

1 1 1 1 1 0 1 1 0 0 0 1 1 1 1

1110100000

0 0 0 0 0 1 0 0 0 0 0 0 1 0 0 1 1 0 1 0 1 1 1 0 1 0 0 0 1 0 0 1 0 1 0 0 1 0

01 1 1 1 0 0 1 0 1 1 1 0 1 1 0 0 0 0 1 0 1 1 1 0 1 0 0 1 1 1 10

User 3 Decoded Data: 1

User 4 Original Data: 1 1 1 0 1

1

0 10 10 0 1 0 0 0 0 0 1 0 0

0 0 1 0 1 1 1 0 0 1 0 0 0 0 11000 1101

0 0 1 1 0 1 1 1 0 0 0 0 0 0 0 1 0 1 1 1 1 1 1

1 1 0 0 1 0 0 0 0 1 1 0 0 1 0 0 0 0 1 1 1 1 0 1 1 0 0 1 0 0 1 0 0

User 4 Decoded Data: 1