

## Final-term Lab Assessment Task

Submitted By:		
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### Parameters:

Consider, your ID = **AB-CDEFG-H**.

[please use any random value if assigned value comes out zero]

<b>VAL1</b> = DFG*100	<b>VAL2</b> = FH*10
<b>945*100 = 94500</b>	<b>41*10 = 410</b>

### Problem Statement:

Suppose, you want to send a message which contains your **FIRST MEMBER ID**. Develop a MATLAB code to show the transmission process to send the information from SENDER to RECEIVER. Available frequency ranges for the transmission: 2.1 - 2.4 GHz

### Hint:

1. Encode the message.
2. Convert binary bit stream from parallel to serial transmission.
3. Convert data to signal using at least **VAL1** sample data.
4. Now, modulate the digital signal (using any Digital to Analog Conversion except ASK) to send via a transmission channel.
5. The signal to noise ratio of the channel is **VAL2**.
6. Demodulate the received signal.
7. Convert the binary data to retrieve the message.

### Instructions:

1. Task can be submitted individually or in Group (not more than 4 person)
2. **For Group Submission:** You can use one of the group member ID for parameter calculation. Anyone from the group can submit the task (no need of multiple submission)
3. Plagiarism is strictly prohibited.
4. Please use MATLAB software to accomplish the project.
5. Use this file as Cover Page.
6. In your submission file, you must add three sections: Cover page, Code & Output.
7. Finally submit it in PDF format.

## Solution

### CODE:

```
clc;
clear all;
close all;
Transmitted_Message= '19-39745-1';
% Covert the message to bit %
VAL1 = 94500;
VAL2 = 410;
x = asc2bin(Transmitted_Message); % Binary Information
VAL1Bin = de2bi(VAL1);
bp =.000001;
% Bit period
disp('Binary Information at Transmitter :');
disp(Transmitted_Message);
disp(x);
% Representation of transmitting binary information as
digital signal %
bit=[];
for n=1:1:length(VAL1Bin)
    if VAL1Bin(n)==1;
        se=ones(1,100);
    else VAL1Bin(n)==0;
        se=zeros(1,100);
    end
    bit=[bit se];
end
t1=bp/100:bp/100:100*length(VAL1Bin)*(bp/100);
subplot(3,1,1);
plot(t1,bit,'lineWidth',2.5);grid on;
axis([ 0 bp*length(VAL1Bin) -.5 6]);
ylabel('amplitude(volt)');
xlabel(' time(sec)');
title('Converting VAL1 To Digital Signal');
%XXX Binary-PSK Modulation XXXX&
```

```

data_NZR=2*x-1;
s_p_data=reshape(data_NZR,2,length(x)/2);
br=10.^6; % Bit rate
f=br; % carrier frequency
T=1/br;
t=T/99:T/99:T;

%MODULATION WITH QPSK
y=[];
y_in=[];
y_qd=[];
for(i=1:length(x)/2)
y1=s_p_data(1,i)*cos(2*pi*f*t);
y2=s_p_data(2,i)*sin(2*pi*f*t);
y_in=[y_in y1];
y_qd=[y_qd y2];
y=[y y1+y2];
end
Tx_signal=y;
tt=T/99:T/99:(T*length(x))/2;
subplot(4,1,3);
plot(tt,y);
axis([ 0 bp*length(x) -.5 6]);
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('Modulated Signal');

%SNR
snry=randn(size(Tx_signal))*std(Tx_signal)/db2mag(VAL2);
disp('SNR value');
disp(snr(Tx_signal,snry));
%QPSK DEMODULATION
mn=[];
Rx_signal=Tx_signal;
for(i=1:length(x)/2)

```

```

Z_in=Rx_signal((i-
1)*length(t)+1:i*length(t)).*cos(2*pi*f*t);
Z_in_intg=(trapz(t,Z_in))*(2/T);
if(Z_in_intg>0)
Rx_in_data=1;
else
Rx_in_data=0;
end
Z_qd=Rx_signal((i-
1)*length(t)+1:i*length(t)).*sin(2*pi*f*t);
Z_qd_intg=(trapz(t,Z_qd))*(2/T);
if(Z_qd_intg>0)
Rx_qd_data=1;
else
Rx_qd_data=0;
end
mn=[mn Rx_in_data Rx_qd_data];
end
figure(2)
stem(mn,'linewidth',2)
title('Demodulated Signal'); % Converting Information
bit to Message %
axis([ 0 11 0 1.5]),grid on;
Received_Message=bin2asc(mn);
disp(' Conversion of the Information bit to Message');
disp(Received_Message);

```

### **Ascii to Binary:**

```

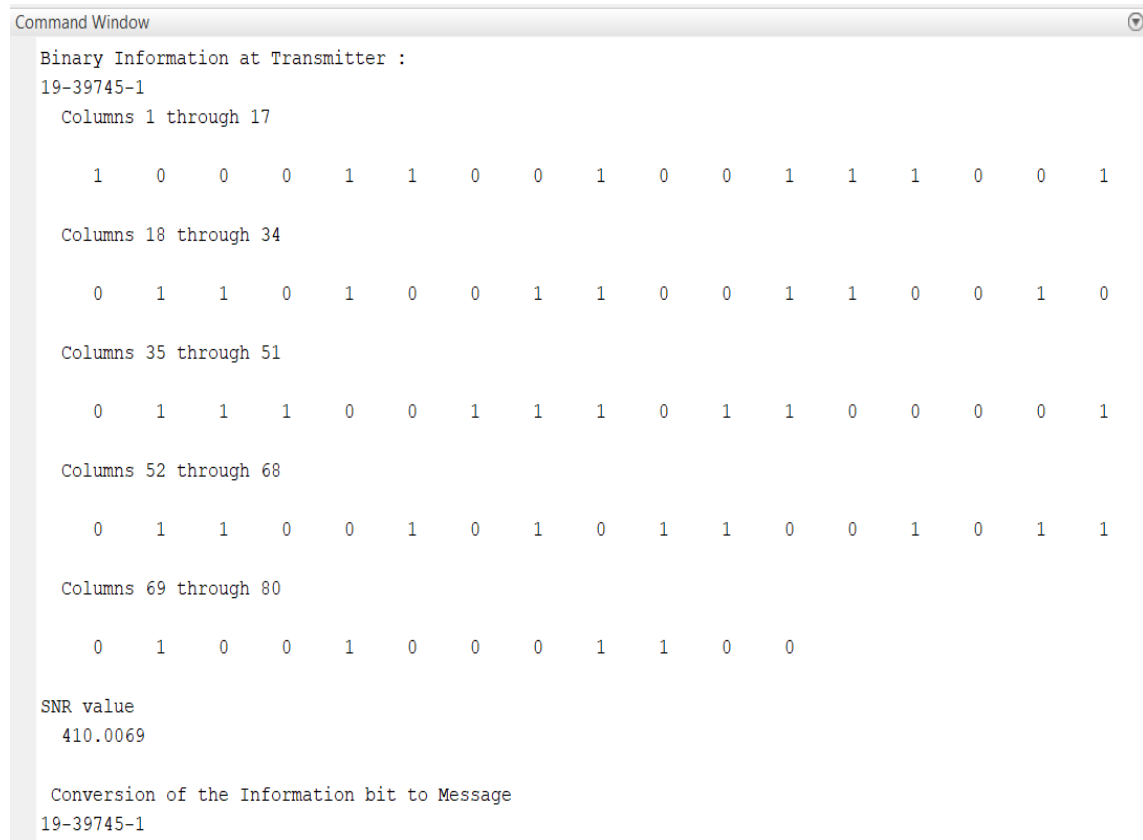
function dn = asc2bin(txt)
dec=double(txt); % Text to ASCII (decimal)
p2=2.^(0:-1:-7);
B=mod(floor(p2'*dec),2); % Decimal to binary conversion
dn=reshape(B,1,numel(B)); % Bytes to serial conversion
end

```

## Binary to Ascii:

```
function txt = bin2asc(dn)
L=length(dn);
L8=8*floor(L/8); % Multiple of 8 Length
B=reshape(dn(1:L8),8,L8/8);
p2=2.^(0:7);
dec=p2*B; % Binary to decimal conversion
txt=char(dec);
end
```

## OUTPUT:



Command Window

Binary Information at Transmitter :  
19-39745-1  
Columns 1 through 17

1	0	0	0	1	1	0	0	1	0	0	1	1	1	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Columns 18 through 34

0	1	1	0	1	0	0	1	1	0	0	1	1	0	0	1	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Columns 35 through 51

0	1	1	1	0	0	1	1	1	0	1	1	0	0	0	0	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Columns 52 through 68

0	1	1	0	0	1	0	1	0	1	1	0	0	1	0	1	1
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Columns 69 through 80

0	1	0	0	1	0	0	0	1	1	0	0
---	---	---	---	---	---	---	---	---	---	---	---

SNR value  
410.0069

Conversion of the Information bit to Message  
19-39745-1

