

Final-term Lab Assessment Task

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Parameters:

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

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

VAL1 = EFG*100	VAL2 = GH*10
647*100 = 64700	71*10 = 710

Problem Statement:

Suppose, you want to send a message which contains your **FIRST MEMBER NAME**. Develop a MATLAB code to show the transmission process to send the information from **SENDER** to **RECEIVER**. Available frequency ranges for the transmission: 1.8 - 2.5 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 BASK) 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.

Code:

```
Transmitted_Message= 'ASIF SHARIF AKASH'
x=asc2bn(Transmitted_Message);
bp=0.001;
disp(' Binary information at Transmitter :');
disp(x);

bit=[];
for n=1:length(x)
    if x(n)==1;
        se=ones(1,100);
    else x(n)==0;
        se=zeros(1,100);
    end
    bit=[bit se];
end
sampling = 1/64700;
t1=bp/100: sampling :100 * length(x) * (bp/100);
subplot(4,1,1);
plot(t1,'lineWidth',2.5);
plot(bit,'lineWidth',2.5)
grid on;
axis([ 0 bp*length(x) -.5 6]);
ylabel('amplitude(volt)');
xlabel(' time(sec)');
title('Transmitting information as digital signal');

A1=5; % Amplitude of carrier signal for information 1
A2=0; % Amplitude of carrier signal for information 0
br=1/bp;
% bit rate
f=br*18*10^5; %carrier frequency --> 1.8GHz
t2=bp/99:bp/99:bp;
ss=length(t2);
m=[];
for (i=1:length(x))
    if (x(i)==1)
        y=A1*cos(2*pi*f*t2);
    else
        y=A2*cos(2*pi*f*t2);
    end
    m=[m y];
end
t3=bp/99:bp/99:bp*length(x);
subplot(4,1,2);
plot(t3,m);
axis([ 0 bp*length(x) -6 6]);
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('Modulated Signal at Transmitter');
```

```

disp('*****')
disp(' Message transmitted through a Transmission medium');
disp('*****')
t4=bp/99:bp/99:bp*length(x);
Rec=awgn(m,710);
subplot(4,1,3);
plot(t4,Rec);
axis([ 0 bp*length(x) -6 6]);
xlabel('time(sec)');
ylabel('amplitude(volt)');
title('Received signal at Receiver')
bit=[];
for n=1:length(mn);
if mn(n)==1;
se=5*ones(1,100);
else mn(n)==0;
se=zeros(1,100);
end
bit=[bit se];
end
t5=bp/100:bp/100:100*length(mn)*(bp/100);
subplot(4,1,4)
plot(t5,bit,'LineWidth',2.5);grid on;
axis([ 0 bp*length(mn) -.5 6]);
ylabel('amplitude(volt)');
xlabel(' time(sec)');
title('Demodulated signal at receiver');

for n=ss:ss:length(Rec)
t=bp/99:bp/99:bp;
y=cos(2*pi*f*t); % carrier signal
mm=y.*Rec((n-(ss-1)):n);
t5=bp/99:bp/99:bp;
z=trapz(t5,mm) ;
% intregation
zz=round((2*z/bp));
if(zz>2.5) % logic level = (A1+A2)/2=7.5
a=1;
else
a=0;
end
mn=[mn a];
end
disp(' Binary information at Reciver :');
disp(mn)

```

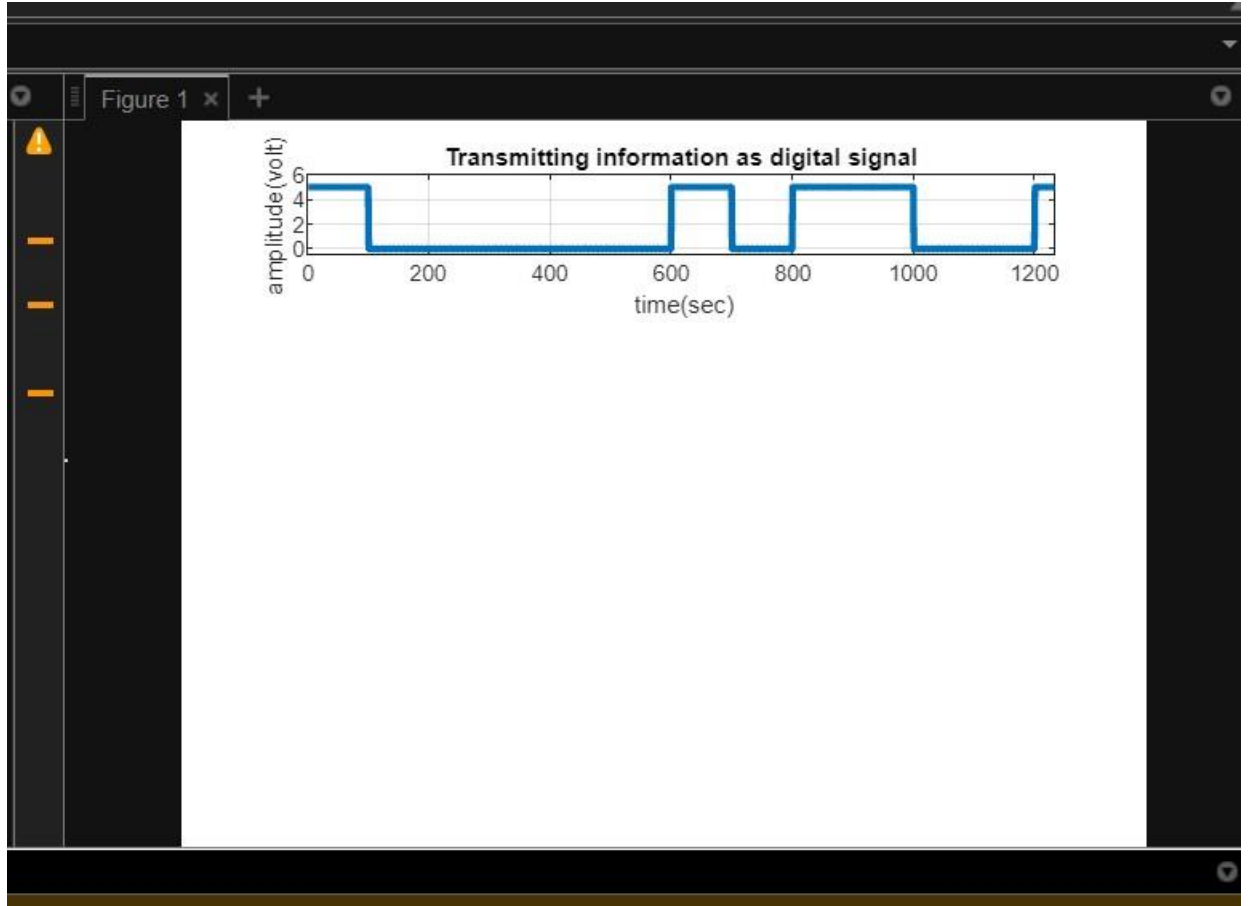
```

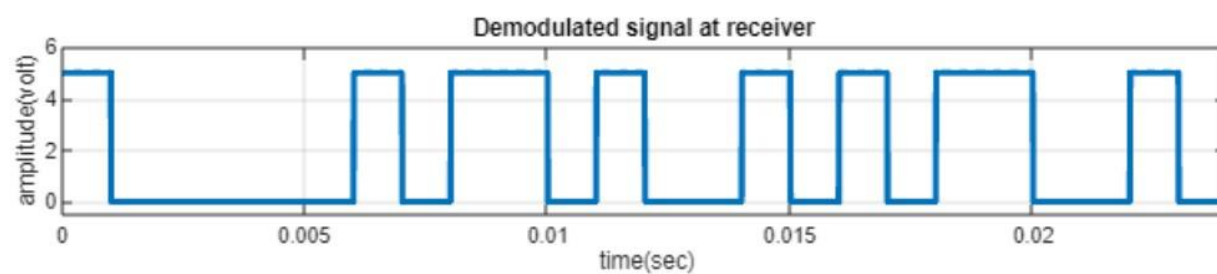
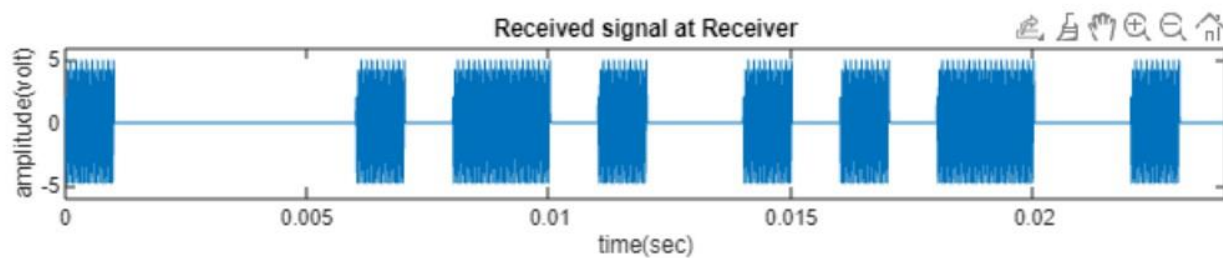
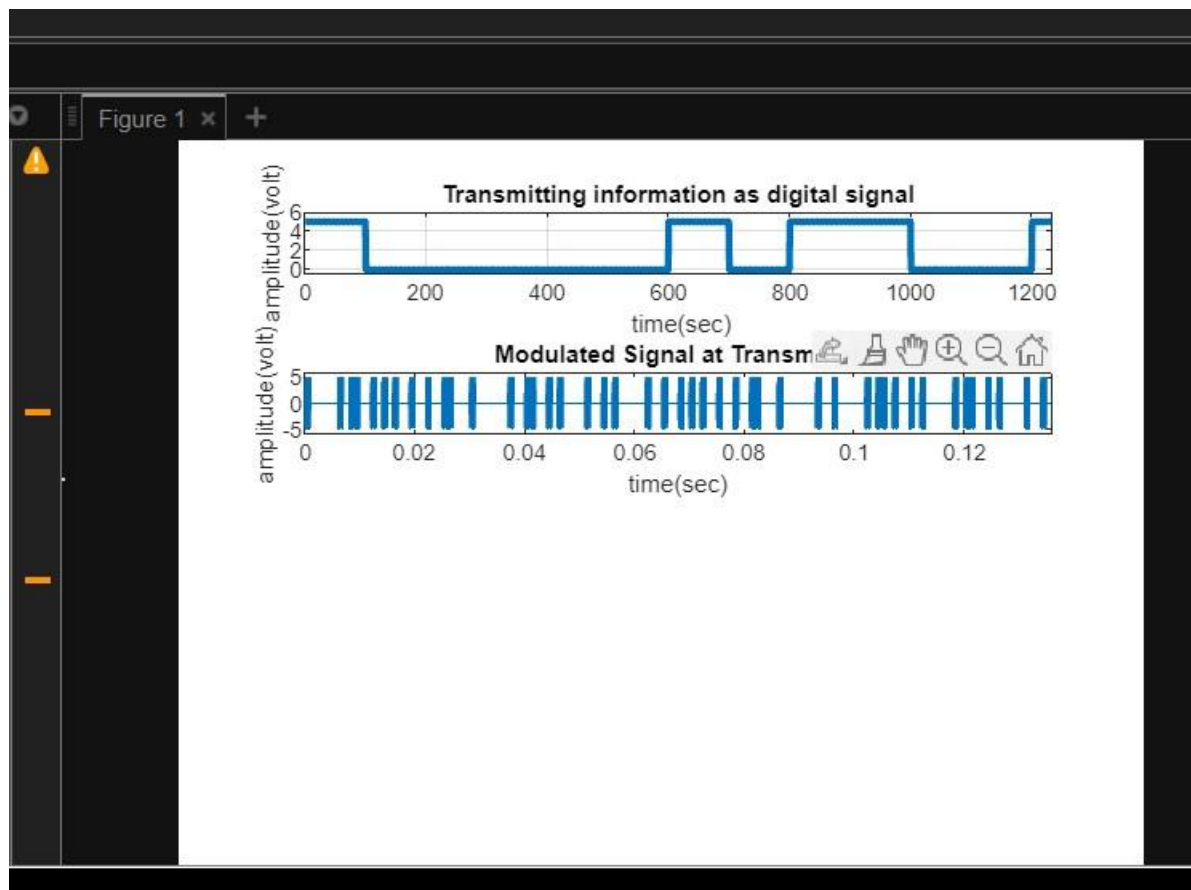
Received_Message = bin2asc(mn)

```

Screenshot:

```
Transmitted_Message =  
  
'ASIF SHARIF AKASH'  
  
Binary information at Transmitter :  
Columns 1 through 27  
  
1 0 0 0 0 0 1 0 1 1 0 0 1 0 1 0 1 0 0 1 0 0 1 0 0 1  
  
Columns 28 through 54  
  
0 0 0 1 0 0 0 0 0 0 1 0 0 1 1 0 0 1 0 0 0 0 1 0  
  
Columns 55 through 81  
  
1 0 1 0 0 0 0 0 1 0 0 1 0 0 1 0 1 0 0 1 0 0 1 0  
  
Columns 82 through 108  
  
1 1 0 0 0 1 0 0 0 0 0 0 1 0 0 1 0 0 0 0 1 0 1 1 0  
  
Columns 109 through 135  
  
0 0 1 0 1 0 0 0 0 0 1 0 1 1 0 0 1 0 1 0 0 0 1 0 0  
  
Column 136  
  
0  
  
>>
```





```

Message transmitted through a Transmission medium
*****
Binary information at Reciver :
Columns 1 through 31
    1  0  0  0  0  0  0  1  0  1  1  0  1  0  0  1  0  1  0  1  1  0  0  1  0  0  0  0  0  0  1  0

Columns 32 through 62
    0  1  0  1  1  0  0  1  0  1  1  1  1  0  0  1  0  1  1  0  0  1  0  1  0  0  0  0  0  1  0  0

Columns 63 through 93
    1  0  1  0  0  1  0  0  1  0  1  0  1  0  1  0  1  0  0  1  0  0  1  0  1  0  0  0  0  0  0  0

Columns 94 through 124
    1  0  0  0  1  0  0  1  0  1  0  1  0  0  0  0  0  1  0  0  0  0  0  1  0  0  1  0  1  0  1  1

Columns 125 through 155
    0  0  1  0  1  0  0  0  0  0  0  1  0  0  1  1  1  0  0  1  0  0  0  0  0  0  0  0  1  0  0  1  0  1

Columns 156 through 186
    1  0  0  1  0  1  0  0  0  0  0  1  0  0  1  0  1  1  0  1  0  1  0  1  0  1  0  1  0  1  0  1  0

Columns 187 through 216
    1  1  0  0  1  0  0  0  1  0  0  0  1  0  1  0  1  0  0  0  1  0  0  1  0  0  1  0  0  1  0  1  0

```

```
Received_Message =
```

```
'ASIF SHARIF AKASH'
```