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Subject: - Digital Communication

LAB REPORT 6

Aim: Perform QPSK modulation using MATLAB or GNU Octave

Code:

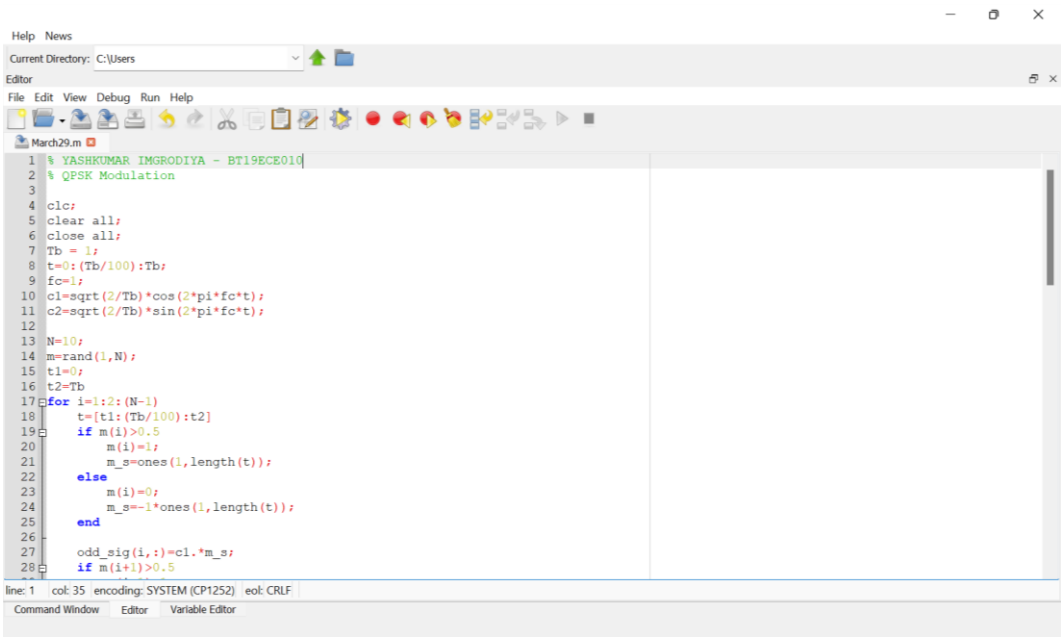
```
% YASHKUMAR IMGRODIYA - BT19ECE010
% QPSK Modulation

clc;
clear all;
close all;
Tb = 1;
t=0:(Tb/100):Tb;
fc=1;
c1=sqrt(2/Tb)*cos(2*pi*fc*t);
c2=sqrt(2/Tb)*sin(2*pi*fc*t);

N=10;
m=rand(1,N);
t1=0;
t2=Tb
for i=1:2:(N-1)
    t=[t1:(Tb/100):t2]
    if m(i)>0.5
        m(i)=1;
```

```
        m_s=ones(1,length(t));
    else
        m(i)=0;
        m_s=-1*ones(1,length(t));
    end

    odd_sig(i,:)=c1.*m_s;
    if m(i+1)>0.5
        m(i+1)=1;
        m_s=ones(1,length(t));
    else
        m(i+1)=0;
        m_s=-1*ones(1,length(t));
    end

    even_sig(i,:)=c2.*m_s;
    qpsk=odd_sig+even_sig;

    subplot(3,2,4);
    plot(t,qpsk(i,:));
    title('QPSK signal')
    xlabel('t--->');
    ylabel('s(t)');
    grid on;
    hold on;
    t1=t1+(Tb+.01);
    t2=t2+(Tb+.01);
end
hold off
subplot(3,2,1);
```

```
stem(m);
title('binary data bits');
xlabel('n--->');
ylabel('b(n)');
grid on;
subplot(3,2,2);
plot(t,c1);
title('carrier signal-1');
xlabel('t--->');
ylabel('c1(t)');
grid on;
subplot(3,2,3);
plot(t,c2);
title('carrier signal-2');
xlabel('t--->');
ylabel('c2(t)');
grid on;
t1=0;
t2=Tb
for i=1:N-1
    t=[t1:(Tb/100):t2]
    x1=sum(c1.*qpsk(i,:));
    x2=sum(c2.*qpsk(i,:));
    if x1>0 && x2>0
        demod(i)=1;
        demod(i+1)=1;
    elseif x1>0 && x2<0
        demod(i)=1;
        demod(i+1)=0;
    elseif x1<0 && x2<0
```

```
        demod(i)=0;
        demod(i+1)=0;
    elseif x1<0 && x2>0
        demod(i)=0;
        demod(i=1)=1;
    end
    t1=t1+(Tb+.01);
    t2=t2+(Tb+.01);
end
subplot(3,2,5);
stem(demod);
title('qpsk demodulated bits');
xlabel('n--->');
ylabel('b(n)');
grid on;
```

Screenshot:



Output: