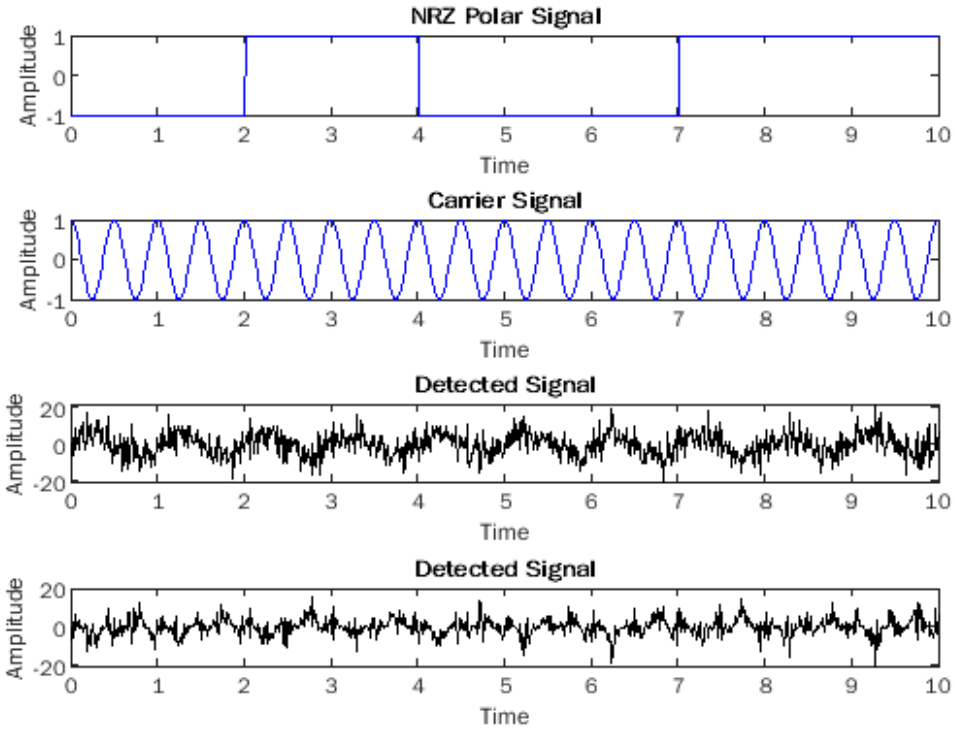
```
% exp 5
% arjun rajesh kulkarni
% 2020uco1505
N=10;
n = randi([0 1],1,N);
for i =1:N
  if n(i) ==1
   polar(i)=1;
  else
   polar(i)=-1;
  end
end
s=100;
i=1;
t=0:1/s:N; %time
for j=1:length(t)
  if t(j)<=i
   m(j)=polar(i);
  else
   m(j)=polar(i);
   i=i+1;
  end
end
subplot(411);
plot(t,m,'b');
xlabel('Time');
ylabel('Amplitude');
title('NRZ Polar Signal');
c=cos(2*pi*2*t);
subplot(412);
plot(t,c,'b');
xlabel('Time');
ylabel('Amplitude');
title('Carrier Signal');
x=m.*c;
subplot(413);
plot(t,x,'r');
xlabel('Time');
ylabel('Amplitude');
title('BPSK Signal');
noise=normrnd(0,5,size(x));
y=x+(c.^340)+5*sin(pi*2*t)+noise;
plot(t,y,'k-');
xlabel('Time');
ylabel('Amplitude');
title('Detected Signal');
y1=y.*c;
subplot(414);
plot(t,y1,'k-');
xlabel('Time');
ylabel('Amplitude');
title('Detected Signal');
```

```
int_op=[];
for i=0:s:length(y1)-s
  int_o = (1/s)*trapz(y1(i+1:i+s));
  int_op=[int_op int_o];
end
n
int_op
disp('Detected Bits');
det=(round(int_op, 1)>=0)
for i=1:length(int_op)
  if int_op(i)<0
   det(i) = 0;
  else
   det(i) = 1;
  end
end
%Bit Rate Error
sum(n~=det)
ber=sum(n~=det)/N
```

```
n =

     0     0     1     1     0     0     0     1     1     1


int_op =

  Columns 1 through 7

   -0.9592    0.0087    0.5001    0.4211   -0.6237   -0.2808   -0.5696

  Columns 8 through 10

    0.6445    0.3394   -0.0006

Detected Bits

det =

  1×10 logical array

   0   1   1   1   0   0   0   1   1   1


ans =

     2


ber =

    0.2000
```



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