## Construction of pulse Modulation

```
%Pulse Amplitude Modulation
clc;
close all;
clear all;
a=5;
fc=100;
fm=10;
fs=100*fc;
t=0:1/fs:4/fm;
x1=a*sin(2*pi*fm*t);
x2=0.5*square(2*pi*fc*t)+0.5;
y=x1.*x2;
subplot (3,1,1);
plot (t,x1,'RED');
title ('Sine Wave / Ashwin / 020');
xlabel('Time');
ylabel('Amplitude');
legend('Message Signal');
grid on;
subplot (3,1,2);
plot (t,x2,'BLUE');
xlabel('Time');
ylabel('Amplitude');
title ('Carrier / Ashwin / 020');
grid on;
subplot (3,1,3);
plot (t,y,'RED');
xlabel('Time');
ylabel('Amplitude');
title ('PAM Signal / Ashwin / 020');
grid on;
```

## Pulse Wave Modulation

```
clc
close all;
clear all;
f1=10;
f2=4;
A=5;
t=0:0.001:1;
C=A*sawtooth(2*pi*f1*t);
subplot (3,1,1);
plot (t,C);
xlabel('Time');
ylabel('Amplitude');
title ('Carrier Sawtooth / Ashwin / 020');
grid on;
m=0.75*A.*sin(2*pi*f2*t);
subplot (3,1,2);
plot (t,m);
xlabel('Time');
ylabel('Amplitude');
title ('Message Signal / Ashwin / 020');
grid on;
n=length(C);
for i=1:n
   if(m(i)>=C(i))
      pwm(i)=1;
   else
      pwm(i)=0;
   end
end
subplot (3,1,3);
plot (t,pwm);
xlabel('Time');
ylabel('Amplitude');
title ('PWM / Ashwin / 020');
axis ([0 1 0 2]);
grid on;
```

## Pulse Wave Modulation

```
clc
close all;
clear all;
f1=10;
f2=4;
A=5;
t=0:0.001:1;
C=A*sawtooth(2*pi*f1*t);
subplot (3,1,1);
plot (t,C);
xlabel('Time');
ylabel('Amplitude');
title ('Carrier Sawtooth / Ashwin / 020');
grid on;
m=0.75*A.*sin(2*pi*f2*t);
subplot (3,1,2);
plot (t,m);
xlabel('Time');
ylabel('Amplitude');
title ('Message Signal / Ashwin / 020');
grid on;
n=length(C);
for i=1:n
   if(m(i)>=C(i))
      pwm(i)=1;
   else
      pwm(i)=0;
   end
end
subplot (3,1,3);
plot (t,pwm);
xlabel('Time');
ylabel('Amplitude');
title ('PWM / Ashwin / 020');
axis ([0 1 0 2]);
grid on;
```

## Polar Lie Coding

## Polar line encoding

```
clc;
close all;
clear all;
bits = [1 1 0 1 1 0 0 1];
bitrate = 1;
n = 1000;
T = length(bits)/bitrate;
N = n*length(bits);
dt = T/N;
t = 0:dt:T;
x = zeros(1,length(t));
for i=1:length(bits)
 if bits(i)==1
 x((i-1)*n+1:(i-1)*n+n/2) = -1;  x((i-1)*n+n/2:i*n) = -1;
 else
 x((i-1)*n+1:(i-1)*n+n/2) = 1;  x((i-1)*n+n/2:i*n) = 1;
 end;
end;
plot (t, x, 'Linewidth', 3);
counter = 0;
for i = 1:length(t)
 if t(i)>counter
 counter = counter + 1;
 if x(i)>0
 result(counter) = x(i);
 else result(counter) = 0;
 end; end;end;
title ('Polar(NRZ-L)linecoding (11011001)/ Ashwin / 020');
disp(result);
```

## Bipolar Encoding

```
clc;
clear all;
close all;
bits = [1 0 1 1 0 1 1 0 0 1 0 1];
Bitrate = 1;
n = 1000;
T = length (bits)/bitrate;
N = n*length (bits);
dt = T/N;
t = 0:dt:T;
x = zeros(1,length(t));
lastbit = 1;
for i=1:length(bits)
 if bits(i)==1
 x((i-1)*n+1:i*n) = -lastbit;
 lastbit = -lastbit;
 end;
end;
plot (t, x, 'Linewidth', 3);
counter = 0;
last bit = 1;
for i = 1:length(t)
 if t(i)>counter
 counter = counter + 1;
 if x(i)==-lastbit
 result (counter) = 1;
 lastbit = -lastbit;
 else result(counter) = 0;
 end;
 end;
end;
title ('Bipolar Encoding
(101101100101)/ Ashwin / 020');
disp(result);
```