



INDIAN INSTITUTE OF INFORMATION
TECHNOLOGY, NAGPUR

Subject: - Digital communication

Enrollment number : BT19ECE010

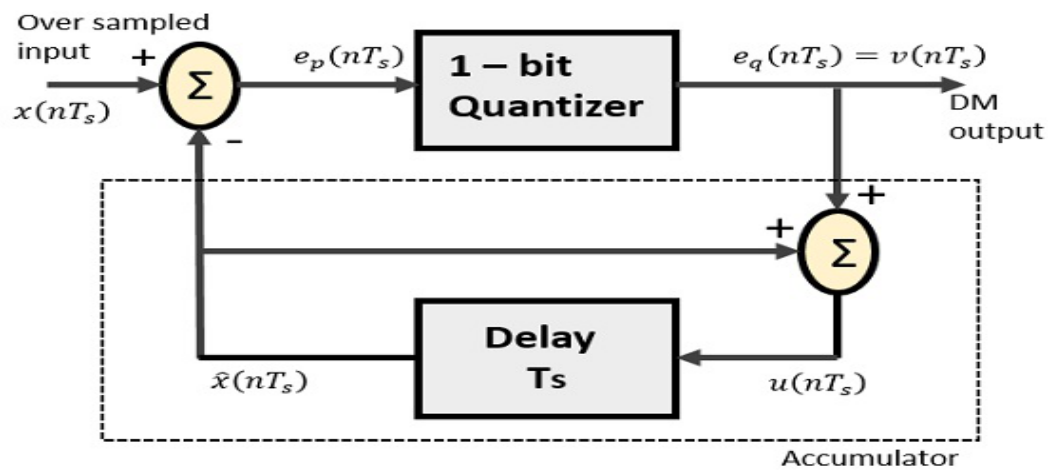
Name : YASHUMAR INGRODIYA

LAB REPORT- 3

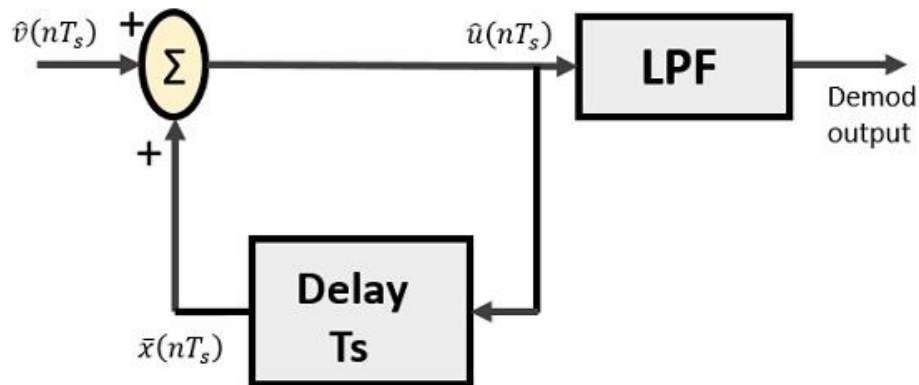
Aim : To derive and get output of delta modulation

Theory :- In Delta modulator we compare present signal with past signal and with fixed step size and therefore transmit only 1 bit per sample.

Delta modulator block diagram



Delta demodulator



Procedure:-

In octave we write code as below:-

```
clc;
clear;
close all;
a=2;
t=0:2*pi/50:2*pi;
x=a*sin(t);
l=length(x);
plot(x,'r', 'linewidth',2);
delta=0.2;
hold on
xn=0; %kp
for i=1:l
    if x(i)>xn(i)
        d(i)=1;
        xn(i+1)=xn(i) + delta;
    else
        d(i)=0;
```

```

        xn(i+1)=xn(i)-delta;
    end
end
stairs (xn, 'b', 'linewidth', 2)
hold on
for i=1:d
    if d(i) >xn(i)
        d(i)=0;
        xn (i+1)=xn(i)-delta;
    else
        d(i) =1;
        xn(i+1)=xn(i)+delta;
    end
end
plot (xn,'g', 'linewidth', 2);
xlabel('TIME');
ylabel ("AMPLITUDE");
title ("DELTA MODULATION",'fontsize', 20);
legend ("input signal","staircase appproximaton","delta modulated signal");
grid on

```

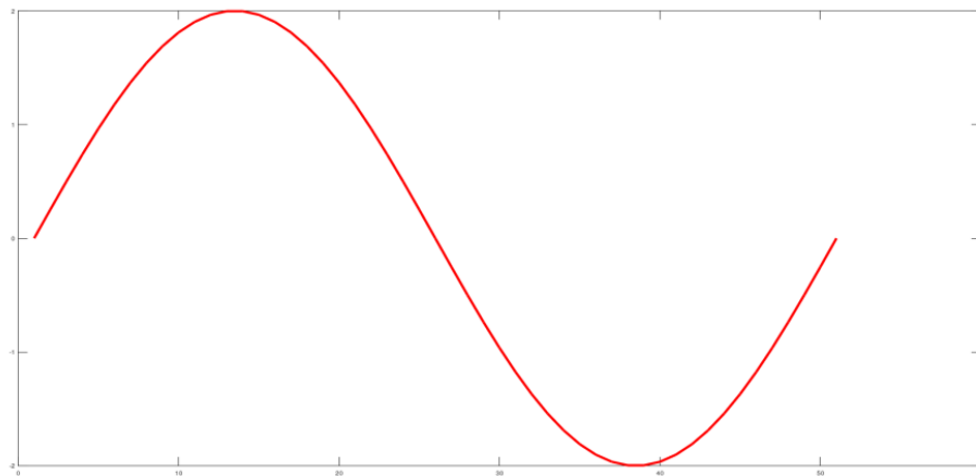
Screenshot:

lab2_DC.m

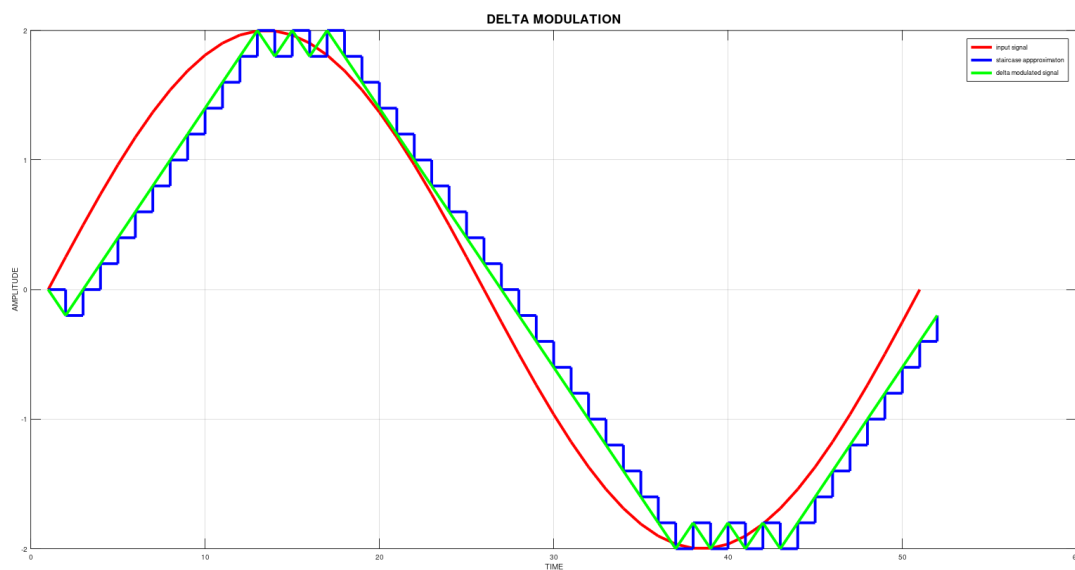
```
1 clc;
2 clear;
3 close all;
4 a=2;
5 t=0:2*pi/50:2*pi;
6 x=a*sin(t);
7 l=length(x);
8 plot(x,'r','linewidth',2);
9 delta=0.2;
10 hold on
11 xn=0; %kp
12 for i=1:l
13     if x(i)>xn(i)
14         d(i)=1;
15         xn(i+1)=xn(i) + delta;
16     else
17         d(i)=0;
18         xn(i+1)=xn(i)-delta;
19     end
20 end
21 stairs (xn, 'b', 'linewidth', 2)
22 hold on
23 for i=1:d
24     if d(i) >xn(i)
25         d(i)=0;
26         xn (i+1)=xn(i)-delta;
27     else
28         d(i) =1;
29         xn(i+1)=xn(i)+delta;
30     end
31 end
32 plot (xn,'g', 'linewidth', 2);
33 xlabel('TIME');
34 ylabel ('AMPT.TIME'):
```

Result:-

Input signal:



We find the output of delta modulation using octave



Results and Discussion :

We can observe three curves in the output graph input signal staircase approximation and delta modulated signal and verified it with practical outputs.

Conclusion:-

We successfully get output of delta modulation using octave and observed it.

