```
1  //To verify sampling theorem
2  clc;
3  clear;
4  close;
5  clf;
6  fm = 100;//input('Enter the input signal frequency : ');
7  k = 2;//input('Enter the number of Cycles of input signal : ');
8  A = 2;//input('Enter the amplitude of input signal : ');
9  pi= %pi;
10 tm =0:1/(fm*fm):k/fm;
11 x = A*cos(2*pi*fm*tm);
12 plot(tm,x,'Linewidth',1.5);
13 xlabel('Time','fontsize',3);
14 ylabel('Amplitude','fontsize',3);
15 xgrid(1);
16
17 //UNDERSAMPLING//
18 fnyq = 2*fm;
19 fs = 0.75*fnyq;
20 n = 0:1/fs:k/fm;
21 xn = A*cos(2*pi*fm*n);
22 plot( n,xn,'r','Linewidth',1.5);
23
24 //NYQUIST SAMPLING//
25 fs = fnyq;
26 n = 0:1/fs:k/fm;
27 xn = A*cos(2*pi*fm*n);
28 a = gca();
29 plot(n,xn,'g','Linewidth',1.5);
30
31 //OVERSAMPLING//
32 fs = 10*fnyq;
33 n = 0:1/fs:k/fm;
34 xn = A*cos(2*pi*fm*n);
35 a = gca();
36 plot(n,xn,'m','Linewidth',1.5);
37 legend('Original Signal','Under Sampled Signal','Nyquist Signal','Over Sampled
   Signal');
38
```