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1 %Yusuf Ahmed Khan, 20ELB084
2 %sampling experiment
3 clear all;
4 close all;
5 clc;
6 t=-10:0.01:10;
7 T=4;fm=1/T;
8 x=cos(2*pi*fm*t);
9 subplot(2,2,1);plot(t,x,'linewidth',3);
10 xlabel('time');ylabel('amplitude');
11 grid;
12 title('input signal');
13 n1=-4:1:4;
14 fs1=1.6*fm;
15 fs2=2*fm;
16 fs3=8*fm;
17 x1=cos(2*pi*fm/fs1*n1);
18 subplot(2,2,2);stem(n1,x1,'linewidth',3);
19 xlabel('number of samples');ylabel('amplitude');
20 hold on;
21 subplot(2,2,2);plot(n1,x1,'linewidth',3);
22 xlabel('time');ylabel('amplitude');
23 grid;
24 title('under sampling');
25 n2=-5:1:5;
26 x2=cos(2*pi*fm/fs2*n2);
27 subplot(2,2,3);stem(n2,x2,'linewidth',3);
28 xlabel('number of samples');ylabel('amplitude');
29 hold on;
30 subplot(2,2,3);plot(n2,x2,'linewidth',3);
31 xlabel('time');ylabel('amplitude');
32 grid;
33 title('uniform sampling');
34 n3=-20:1:20;
35 x3=cos(2*pi*fm/fs3*n3);
36 subplot(2,2,4);stem(n3,x3,'linewidth',3);
37 hold on;
38 subplot(2,2,4);plot(n3,x3,'linewidth',3);
39 xlabel('number of samples');ylabel('amplitude');
40 xlabel('time');ylabel('amplitude');
41 grid;
42 title('over sampling');
43

```