```
// Analog signal modulation
fs = 8000;
t = [0:0.1*fs]/fs;
fm = 20;
fc = 300;
Am = 1 ;
Ac = 1;
u = Am / Ac;
m = Am*cos(2*pi*fm*t);
c = Ac*cos(2*pi*fc*t);
s = Ac*[1+u*cos(2*pi*fm*t)].*cos(2*pi*fc*t);
subplot(3,3,1:3);
plot(t,m);
xlabel('time:');
ylabel('Amplitude:');
title('Message Signal / Prabhat / 022');
grid on;
subplot(3,3,4:6);
plot(t,c);
xlabel('time:');
ylabel('Amplitude:');
title('Carrier Signal / Prabhat / 022');
grid on;
subplot(3,3,7);
plot(t,s);
xlabel('time:');
ylabel('Amplitude:');
title('Perfectly modulated am / Prabhat / 022');
grid on;
subplot(3,3,8);
Am = 0.5;
u = Am / Ac;
s2 = Ac*[1+u*cos(2*pi*fm*t)].*cos(2*pi*fc*t);
plot(t,s2);
xlabel('time:');
ylabel('Amplitude:');
title('Under modulated am / Prabhat / 022');
grid on;
subplot(3,3,9);
Am = 3;
u = Am / Ac;
s3 = Ac*[1+u*cos(2*pi*fm*t)].*cos(2*pi*fc*t);
plot(t,s3);
xlabel('time:');
ylabel('Amplitude:');
title('Over modulated am / Prabhat / 022');
grid on;
```