num\_bit = 10;

bit = rand(1, num\_bit);

bit\_4out5in = round(bit) #四捨五入

plot(bit\_4out5in)

wave\_bit = bit\_4out5in'\*ones(1, 100) #轉至完，生成每列100個相同數字

wave\_bit\_wave = reshape(wave\_bit', 1, 1000) #10\*100轉至完，改成一列1000個數字

t = 10^-3:10^-3:1; #開始：間隔：結尾

figure(2);

plot(t, wave\_bit\_wave);

ylim([-0.5 1.5]);

inv\_bit = abs(wave\_bit\_wave-1);

%%%%%%%%%

%carriers

f1 = 10; f2 = 5;

cal1 = cos(2\*pi\*f1\*t);

cal2 = cos(2\*pi\*f2\*t);

figure(3);

subplot(2,1,1);

plot(t, cal1);

subplot(2,1,2);

plot(t, cal2);

%%%%%%%%%

%fsk\_wave

fsk\_wave = cal1.\*wave\_bit\_wave + cal2.\*inv\_bit

figure(4);

subplot(2,1,1);

plot(t, wave\_bit\_wave);

ylim([-0.5 1.5]);

subplot(2,1,2);

plot(t, fsk\_wave);

%%%%%%%%%%%%%%%%%%

%demondulation FSK

rxf1 = fsk\_wave.\*cal1;

rxf2 = fsk\_wave.\*cal2;

figure(5);

subplot(2,1,1);

plot(t, rxf1);

subplot(2,1,2);

plot(t, rxf2);

rx\_2nd = rxf1 - rxf2;

figure(6);

subplot(2,1,1);

plot(t, wave\_bit\_wave);

ylim([-0.5 1.5]);

subplot(2,1,2);

plot(t, rx\_2nd);