```matlab
close all;
clear;
clc;

floor(513/2)

db2mag(1)

%std_deviation = 5;

N = 513;
SNR = 10;
[X, X_real] = signal(N,SNR);
n = linspace(-256,256,513);
omega_hat = zeros(1,4);
idx = 1;
for k = 10:2:16
    omega_hat(idx) = find_omega_hat(k,X_real);
    idx = idx+1;
end
%omega_hat_real = find_omega_hat(k, X_real);
f_hat = omega_hat/(2*pi)
phase_hat = find_phase_hat(omega_hat(4), X);
plot(X, 'x');
hold on;
plot(X_real, 'o');
```
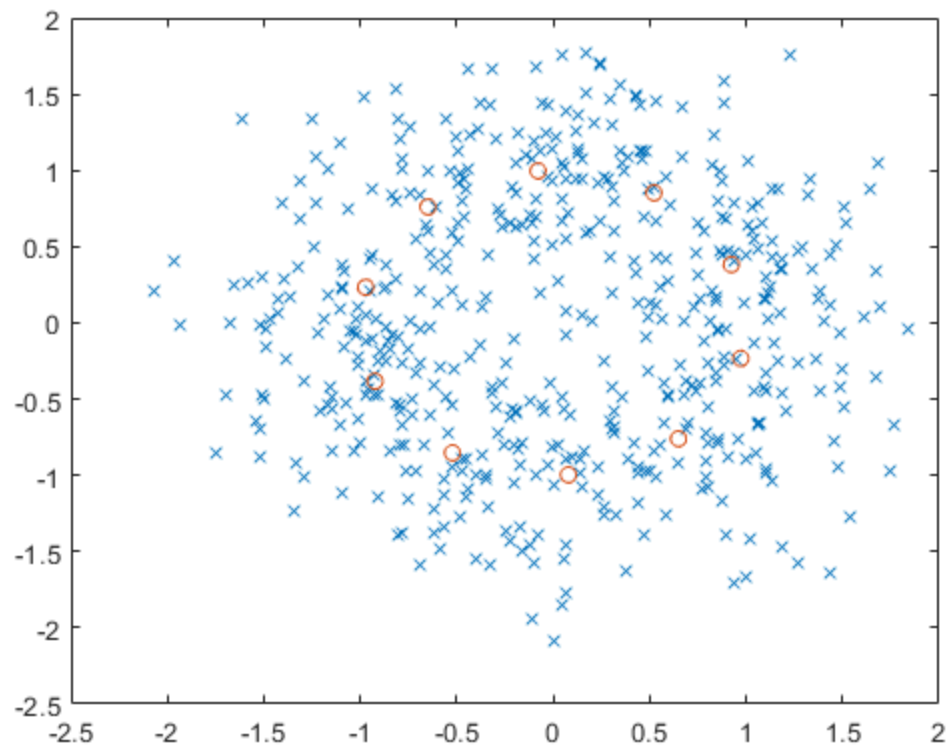
ans =

   256

ans =

    1.1220

f_hat =

   *1.0e+05 ***

    0.9961   1.0010   0.9998   1.0001

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