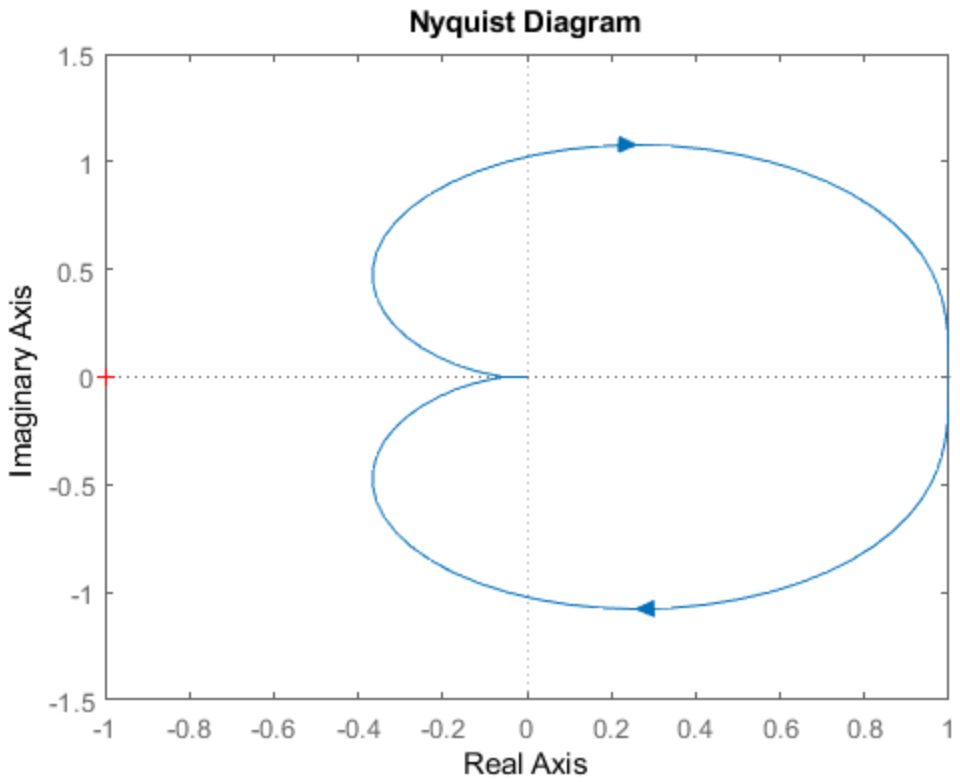
```
% Title -  Study the discrete time system using Matlab
% Objective - To study the time and freq response of a discrete data
 system
% and analyze the stability of the closed loop samled sata system.

% 1) Find the discrete time response of G(Z)=Z/(Z^2 + 0.7Z + 0.3)
 subjected
% to a unit step input.

% 2) Obtain the frequency response of a digital system with T.F. = Z/
Z^2+2
% and sampling interval T=0.1 sec. To get the magnitude and phase plot
 of
% the frequency response use the command 'bode'.

% 3) Obtain the digital nyquist plot to analyze the stability of the
 closed
% loop sampled data. Analogy system is shown in the figure with plant
% T.F. = G(s) = 1/s(s+1). Use the command dnyquist.

%                                  +-----+    +------+
%                      e(t)        |     |    |      |
%               (+)    /           | ZOH |----| G(S) |
%       Yd(t)----->O--/   ------->|     |    |      |----+---> y(t)
%               (-)|              +-----+    +------+    |
%                  |                                     |
%                  +---<------------<----------<---------+
%

num = [1];
den = [1 1 0];
sys = tf(num,den);
sys1 = feedback(sys,1);
sys2 = c2d(sys1,0.1,'zoh');
[N,D] = branch(sys2);
dnyquist(N,D,0.1);
```



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