

Heaven's Light is Our Guide  
Rajshahi University of Engineering & Technology



Sessional Course Code: ECE 4124  
Course name: Digital Signal Processing Sessional

**Submitted To:**

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Experiment No: 05

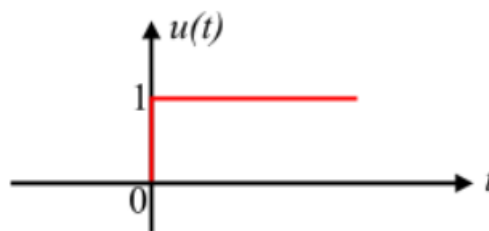
Experiment Date: 11/06/23

Experiment Name: Study of Causal, Non-causal and Anti causal Signals

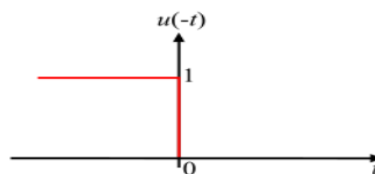
Objective:

- Familiar with the causal, anti-causal and non-causal signal.
- Practically implement it with a function.

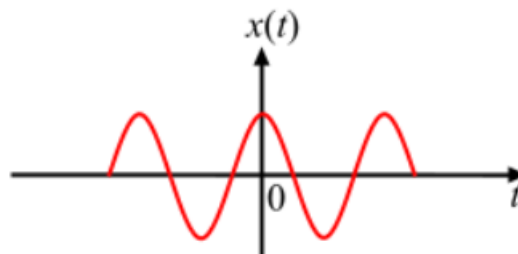
Theory: A causal system is the one in which the output  $y(n)$  at time  $n$  depends only on the current input  $x(n)$  at time  $n$ , and its past input sample values such as  $x(n-1)$ ,  $x(n-2)$ , .... it does not exist for negative time.



If a system output depends on future input values such as  $x(n+1)$ ,  $x(n+2)$ , ..., the system is anti-causal. It is equal to zero for all positive time values.



It contains both positive and negative time values. The noncausal system cannot be realized in real time.



Required Tools: MATLAB 2015a.

## Code & Output:

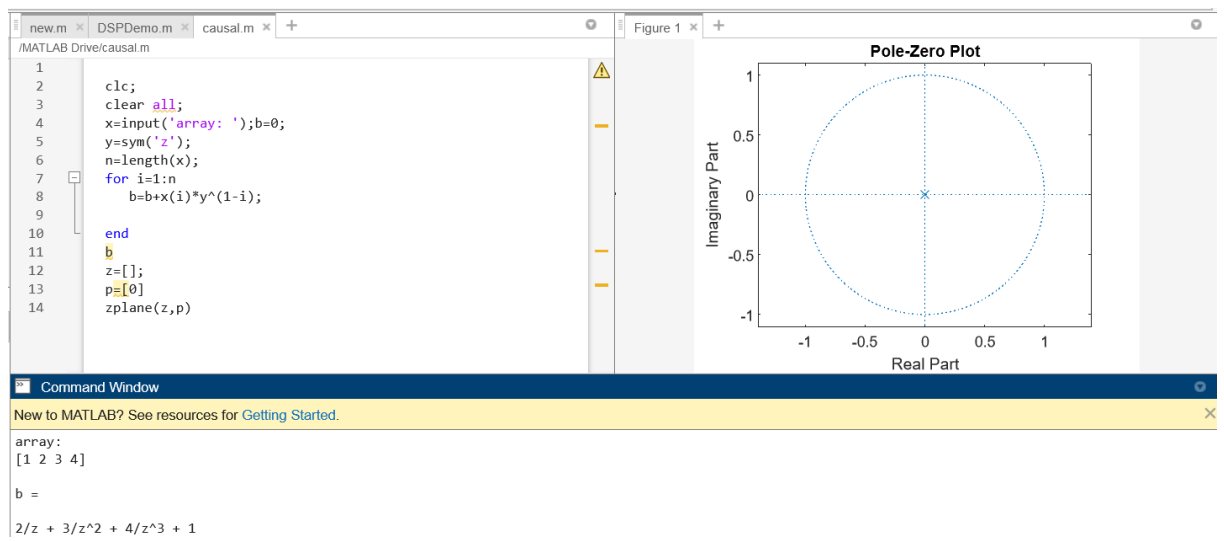


Fig1: Implementation of causal signals

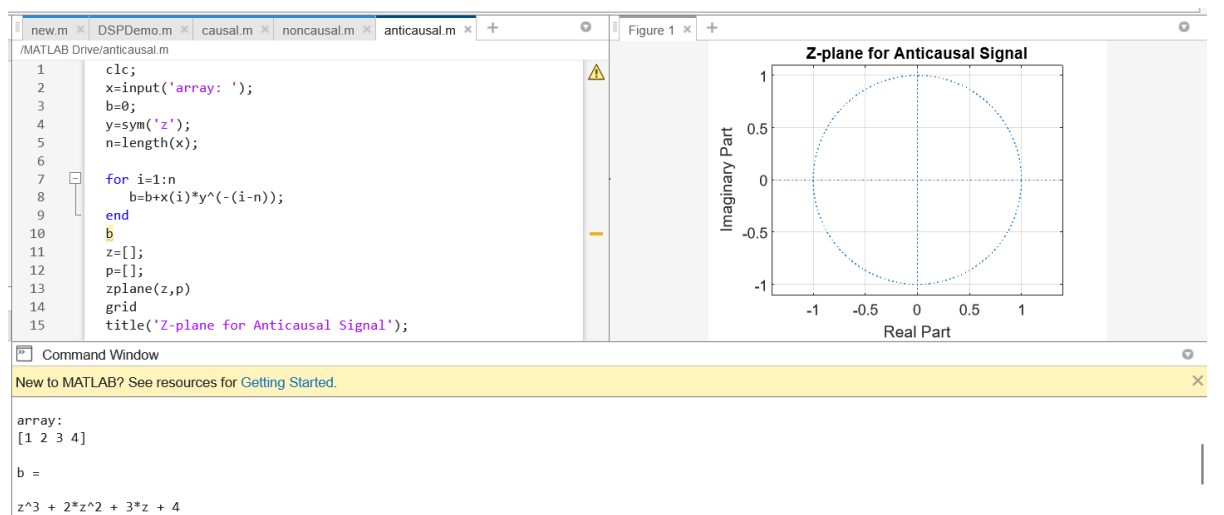


Fig2: Implementation of anti-causal signals

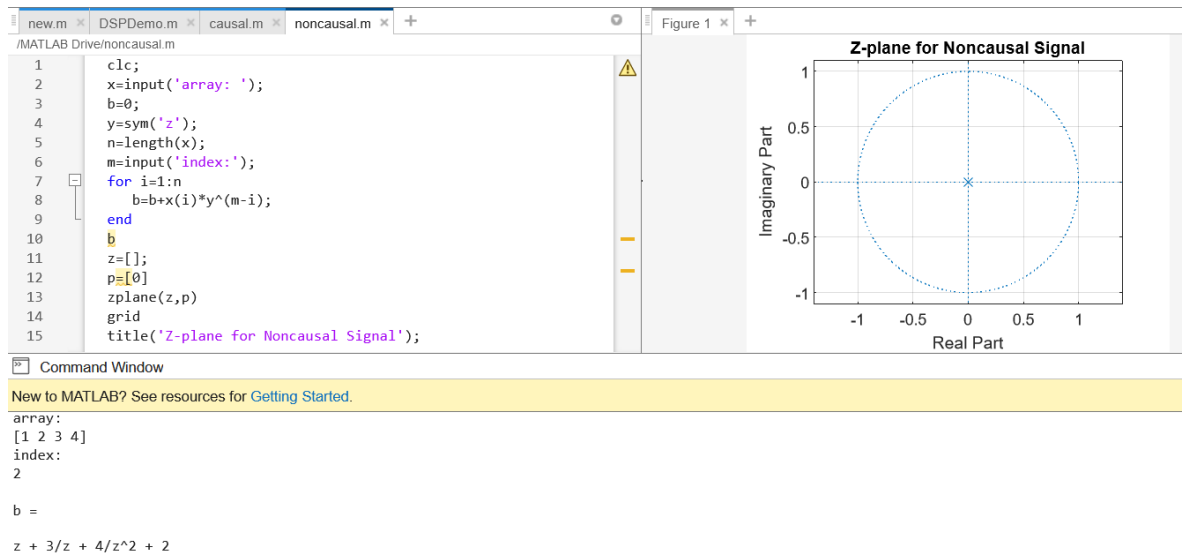


Fig3: Implementation of non-causal signals

**Discussion:** This experiment is mainly focused on implementation of causal, anti-causal and non-causal system. The code gave the desired output. Later the position of X value is calculated.

**Conclusion:** We tried to plot the poles and zeros of causal, anti-causal and non-causal signals. The output resembles our theory.

### References:

1. Causal, Noncausal and Anti-causal signals

<https://www.tutorialspoint.com/signals-and-systems-causal-non-causal-and-anti-causal-signals>

[Online]. [Accessed August 18, 2023]

