

**Independent University Bangladesh**

Department of Electrical and Electronics Engineering

**Lab Report** **02**

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Course code: EEE 321L

Couse name: Digital Signal Processing Lab

Lab no: 02

Lab title: Study of discrete signals and systems

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1. **Function definitions**
   1. Unit Impulse Sequence (impseq.m)

% function to generate unit impulse sequence(delay n0, range n1, n2)

function [x, n] = impseq(n0, n1, n2)

n = n1:n2; % define range

x = (n-n0) == 0; % array with 1 when n-n0 = 0 otherwise 0

end

* 1. Unit Step Sequence (stepseq.m)

% function to generate unit step sequence (delay n0, range n1, n2)

function [x, n] = stepseq(n0, n1, n2)

n = n1:n2;

x = (n - n0) >= 0; % 1 when n-n0 >= 0, 0 otherwise

end

1. **Signal generations**
   1. x(n) = u(n+1) where -10 ≤ n ≤ 10

Call:

% x(n) = u(n+1) for -10:10

[x, n] = stepseq(-1, -10, 10); % delay = -1

stem(n, x)

Output:



* 1. x(n) = - u(n-2) where -10 ≤ n ≤ 10

Call:

% x(n) = -u(n-2) for -10:10

n = -10:10;

y = -stepseq(2,-10,10);

stem(n,y)

Output:

* 1. x(n) = δ(n-2) where -10 ≤ n ≤ 10

Call:

% x(n) = d(n-2) for -10:10

[x, n] = impseq(2, -10, 10);

stem(n, x)

Output:



* 1. x(n) = -δ(n+2) where -10 ≤ n ≤ 10

Call:

% x(n) = -d(n+3) for -10:10

n = -10:10;

y = -impseq(-3,-10,10);

stem(n,y)

Output:



* 1. x(n) = u(n+1) + δ(n-2) where -10 ≤ n ≤ 10

Call:

% x(n) = u(n+1) + d(n-2) for -10:10

n = -10:10;

y = stepseq(-1, -10, 10) + impseq(2,-10,10);

stem(n,y)

Output:



1. Function to generate a ramp signal

Definition (rampseq.m)

% function to generate unit step sequence (delay n0, range n1,n2)

function [x, n] = rampseq(n0, n1, n2)

n = n1:n2;

x = (n-n0).\*[(n-n0) >= 0]; % 1\*(n-n0) when n-n0 >= 0, 0 otherwise

end

Calls:

% x(n) = ramp(n) for -10:10

[x, n] = rampseq(0, -10, 10);

stem(n, x)

% x(n) = ramp(n-4) for -10:10

[x, n] = rampseq(4, -10, 10);

stem(n, x)

% x(n) = ramp(n-4) for -10:10

n = -10:10;

y = -rampseq(4,-10,10);

stem(n,y)

Outputs:

  
  
