Heaven's Light is Our Guide

Rajshahi University of Engineering& Technology

Department of Electrical & Computer Engineering

Course No: ECE 4124
Course Name: Digital Signal Processing Sessional

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Experiment Name: Presentation of some signals using MATLAB.

1. Plot unit step, unit impulse and unit ramp signal using conditions.
2. Plot a discrete signal.
3. Plot two discrete signal, their addition and subtraction.
4. Plot two given continuous signal.

Theory: Within the try, we worked with ceaseless and discrete signals. A flag that shifts easily and persistently over time is alluded to as a continuous-time flag. These signals speak to a quantity of intrigued that's affected by an autonomous variable, usually considered as time. A discrete-time flag could be a grouping of values of intrigued, where the integer list can be thought of as a time list, and the values within the arrangement speak to a few physical amount of intrigued.

The step flag or step work is that sort of standard flag which exists as it were for positive time and it is zero for negative time. In the event that a step flag has solidarity size, at that point it is known as unit step flag or unit step work. It is indicated by u(t).

The unit drive flag has zero sufficiency all over but at t = 0. At the root (t = 0) the plentifulness of drive flag is interminability so that the area under the bend is solidarity. It is indicated by δ(t).

A incline work or incline flag may be a sort of standard flag which begins at t = and increments directly with time. The unit slope work has unit slop. It is indicated by r(t).

Any flag can be plotted utilizing MATLAB. To plot any given flag the conditions ought to be connected to fulfill the given criteria.

Required software: MATLAB

Code:

Code 1: Unit step, unit impulse and unit ramp-

```
clc;
clear all;
close all;

t=-5:0.001:5;
step1= t>= 0;
step2= t==0;
step3= (t>=0).*t;

subplot(3,1,1);
plot(t,step1);
xlabel('Time');
```

```
ylabel('Amplitude');
title('Unit step');
ylim([-0.1, 1.1]);

subplot(3,1,2);
plot(t,step2);
xlabel('Time');
ylabel('Amplitude');
title('Unit Impluse');
ylim([-0.1,  1.1]);

subplot(3,1,3);
plot(t,step3);
xlabel('Time');
ylabel('Amplitude');
title('Unit ramp');
ylim([-0.5, 5.5]);
```

Code 2: Discrete signal -

```
clc;
clear all;
close all;

x=[2, 0, -2, 3, 1, 4, 6];
n=[1 2 4 5 6 8 3];
stem(n,x);
xlabel('n');
ylabel('x');
xlim([0, 9]);
ylim([-3, 7]);
```

Code 3: Two different signals, their addition and subtraction-

```
clc;
clear all;
close all;

t=-10:1:20;
step1= t>=0 & t<=10;
step2= t>=5 & t<=15;

subplot(4,1,1);
stem(t,step1);
xlabel('Time');
ylabel('Amplitude');
title('Signal 1');

subplot(4,1,2);
stem(t,step2);
xlabel('Time');
ylabel('Amplitude');
title('Signal 2');
```

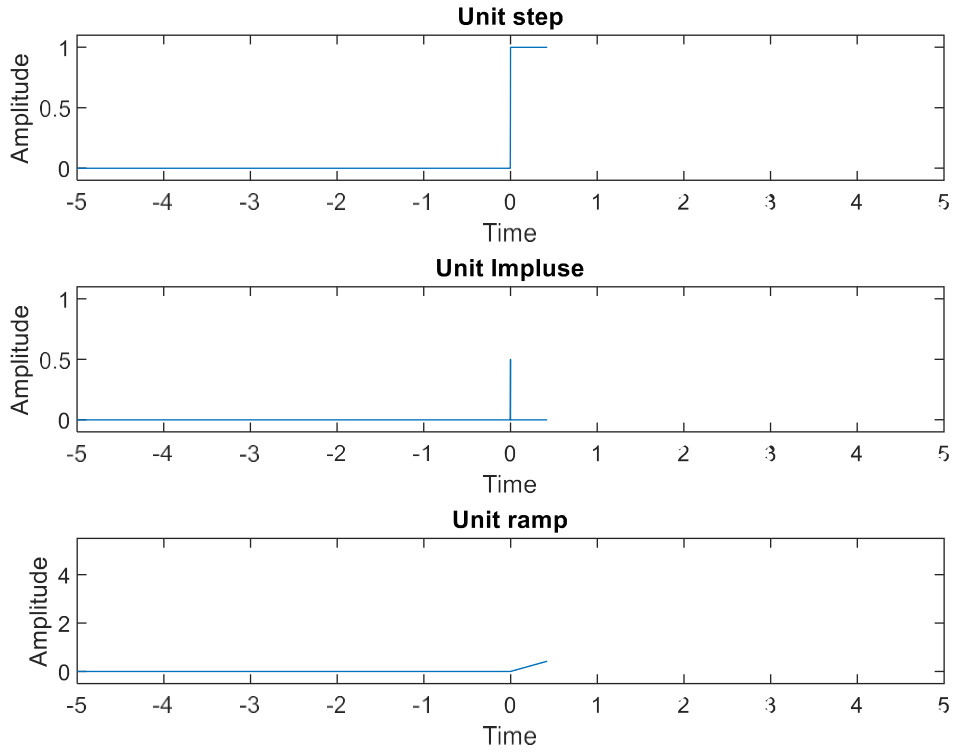
```
20.
21. step3 = step1+step2
22. subplot(4,1,3);
23. stem(t,step3);
24. xlabel('Time');
25. ylabel('Amplitude');
26. title('Addition');
27.
28. step4 = step1-step2
29. subplot(4,1,4);
30. stem(t,step4);
31. xlabel('Time');
32. ylabel('Amplitude');
33. title('Subtraction');
```

Code 4: Presentation of two signals-

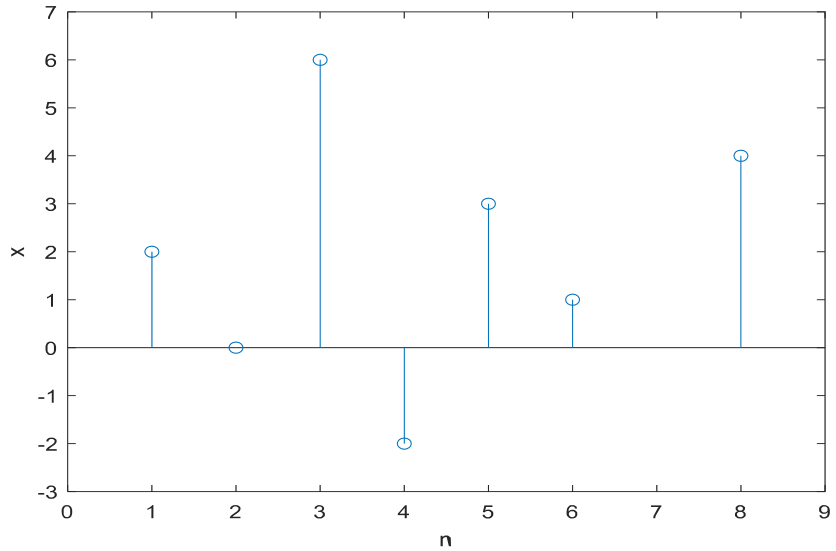
```
1.  clc;
2.  clear all;
3.  close all;
4.
5.  t=0:1:7;
6.  u = [ones(1,1).*1 ones(1,2).*2 ones(1,1).*4 ones(1,1).*4 ones(1,2).*2
    ones(1,1)];
7.  subplot(2,1,1);
8.  plot(t,u);
9.  xlabel('Time');
10. ylabel('Amplitude');
11. title('Signal 1');
12. xlim=([0, 8]);
13. ylim([1, 5]);
14.
15. t=0:1:6;
16. u1 = [zeros(1,1) ones(1,5) zeros(1,1)];
17. subplot(2,1,2);
18. plot(t,u1);
19. xlabel('Time');
20. ylabel('Amplitude');
21. title('Signal 2');
22. xlim=([-0, 7]);
23. ylim([0, 1.1]);
```

Output Graph:

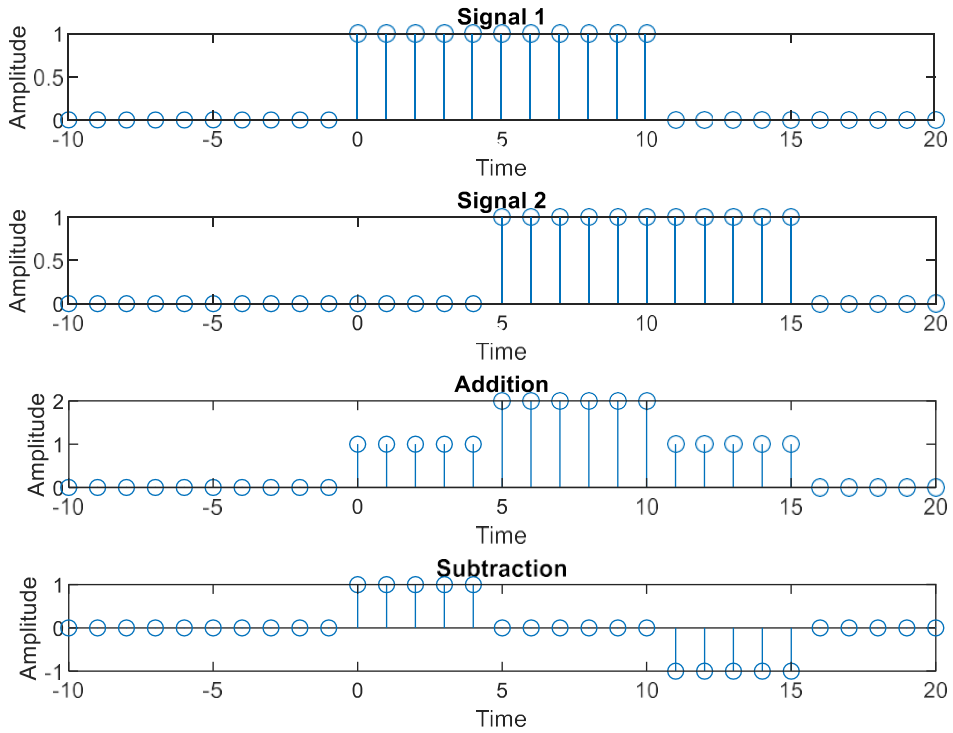
Output 1: Unit step, unit impulse and unit ramp-



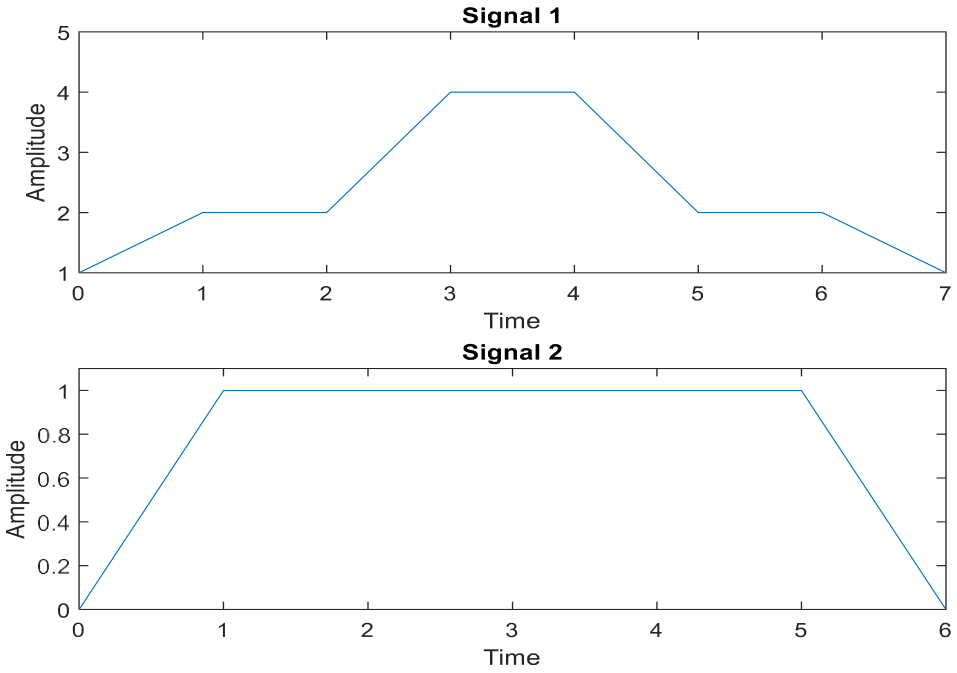
Output 2: Discrete signal –



Output 3: Two different signals, their addition and subtraction-



Output 4: Presentation of two signals-



Discussion: Here in this test, firstly we worked with the unit step, unit drive and unit slope signals utilizing conditions not the built in capacities. For unit step some time recently time zero all values are zero and after time zero all are one. For motivation as it were one esteem at zero, something else zero values. Discrete plot was done by utilizing stem work.

We worked with two distinctive signals, include at that point and subtract them utilizing steps. For the final code to plot the two given signals we have utilized ones and zeros to form functions. In code 4, the primary plot was not correct but near to the given one. The moment one was comparable to the given work.

Conclusion: Within the test, we have plotted diverse nonstop and discrete capacities. The codes gave adjust yield charts which were same as the hypothetical clarification and given capacities.