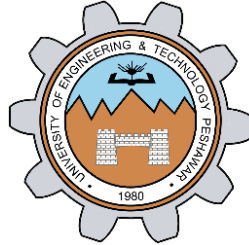


**STUDY OF CONTINUOUS TIME
SIGNAL USING
MATLAB
LAB # 02**



Fall 2023

CSE-402L

Digital Signal Processing Lab

Submitted by: **AIMAL KHAN**

Registration No.: **21PWCSE1996**

Class Section: **A**

“On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work.”

Student Signature: _____

A handwritten signature in black ink, appearing to be "Aimal Khan", written over a horizontal line.

Submitted to:

Dr. Yasir Saleem Afridi.

Friday, October 13, 2023

Department of Computer Systems Engineering
University of Engineering and Technology, Peshawar

Demonstration of Concepts	Poor (Does not meet expectation (1)) The student failed to demonstrate a clear understanding of the assignment concepts	Fair (Meet Expectation (2-3)) The student demonstrated a clear understanding of some of the assignment concepts	Good (Exceeds Expectation (4-5)) The student demonstrated a clear understanding of the assignment concepts	Score 30%
Accuracy	The student completed (<50%) tasks and provided MATLAB code and/or Simulink models with errors. Outputs shown are not correct in form of graphs (no labels) and/or tables along with incorrect analysis or remarks.	The student completed partial tasks (50% - <90%) with accurate MATLAB code and/or Simulink models. Correct outputs are shown in form of graphs (without labels) and/or tables along with correct analysis or remarks.	The student completed all required tasks (90%-100%) with accurate MATLAB code and/or Simulink models. Correct outputs are shown in form of labeled graphs and/or tables along with correct analysis or remarks.	30%
Following Directions	The student clearly failed to follow the verbal and written instructions to successfully complete the lab	The student failed to follow the some of the verbal and written instructions to successfully complete all requirements of the lab	The student followed the verbal and written instructions to successfully complete requirements of the lab	20%
Time Utilization	The student failed to complete even part of the lab in the allotted amount of time	The student failed to complete the entire lab in the allotted amount of time	The student completed the lab in its entirety in the allotted amount of time	20%

Dr. Yasir Saleem Afridi

Study Of Continuous -Time Signal Using MATLAB

Objectives:

- In this lab, you will implement the following continuous-time signal using MATLAB and will explore briefly at least two characteristics of each signal.

Tasks:

Task 1: Unit Sample Sequence

Code:

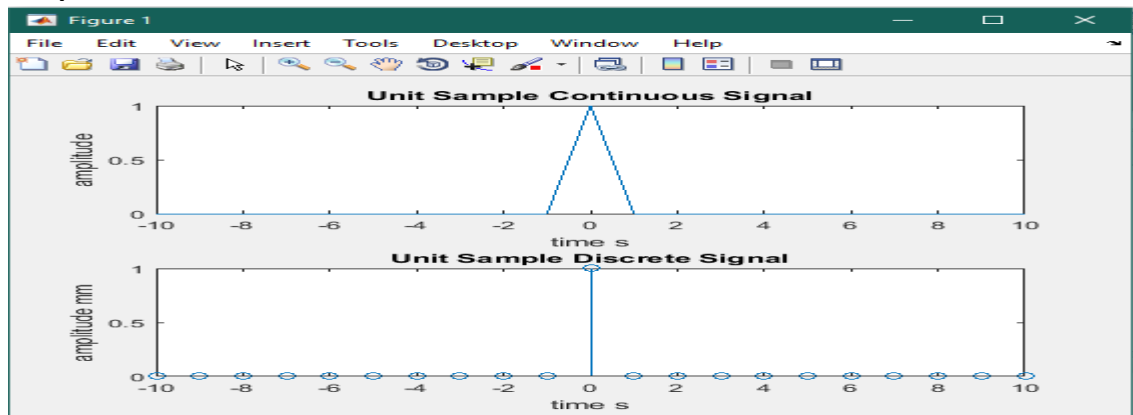
```
clc;
clear;
close all;

% Unit Sample Sequence
time = -10:10;
unitImpulse = time == 0;

subplot(2, 1, 1)
plot(time, unitImpulse);
xlabel('time s');
ylabel('amplitude');
title('Unit Sample Continuous Signal');

subplot(2, 1, 2)
stem(time, unitImpulse);
xlabel('time s');
ylabel('amplitude mm');
title('Unit Sample Discrete Signal')
```

Output:



Task 2: Unit Step Signal

Code:

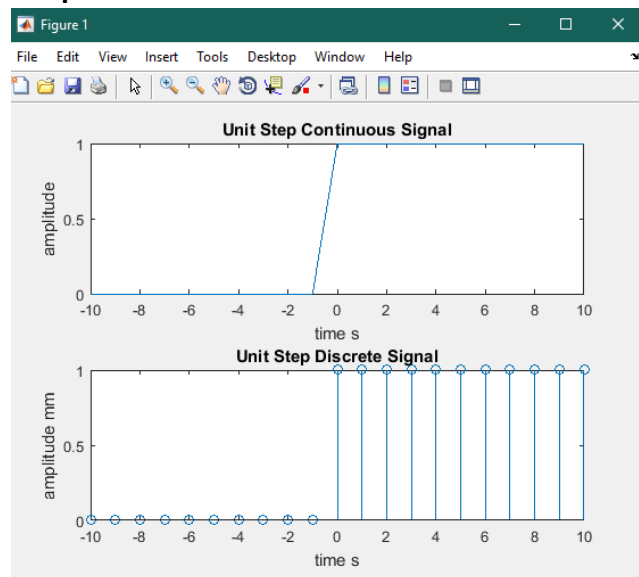
```
clc;
clear;
close all;

% Unit Step Signal
time = -10:10;
unitStep = time >= 0;

subplot(2, 1, 1)
plot(time, unitStep);
xlabel('time s');
ylabel('amplitude');
title('Unit Step Continuous Signal');

subplot(2, 1, 2)
stem(time, unitStep);
xlabel('time s');
ylabel('amplitude mm');
title('Unit Step Discrete Signal')
```

Output:



Task 3: Ramp Signal

Code:

```
clc;
clear;
close all;

% Ramp Signal
```

```

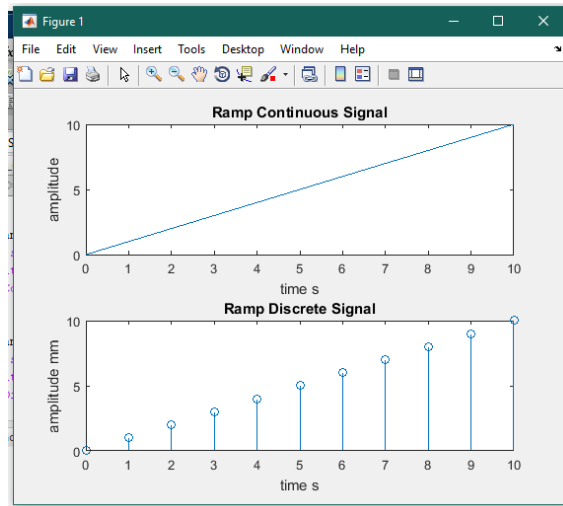
time = 0:10;
rampSignal = time;

subplot(2, 1, 1)
plot(time, rampSignal);
xlabel('time s');
ylabel('amplitude');
title('Ramp Continuous Signal');

subplot(2, 1, 2)
stem(time, rampSignal);
xlabel('time s');
ylabel('amplitude mm');
title('Ramp Discrete Signal')

```

Output:



Task 4: Parabolic Signal

Code:

```

clc;
clear;
close all;

% Parabolic Signal
time = -10:10;
parabolicSignal = time.^2;

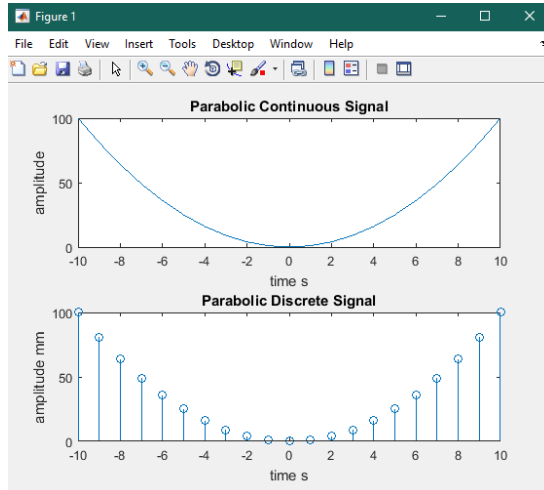
subplot(2, 1, 1)
plot(time, parabolicSignal);
xlabel('time s');
ylabel('amplitude');
title('Parabolic Continuous Signal');

subplot(2, 1, 2)
stem(time, parabolicSignal);

```

```
xlabel('time s');  
ylabel('amplitude mm');  
title('Parabolic Discrete Signal')
```

Output:

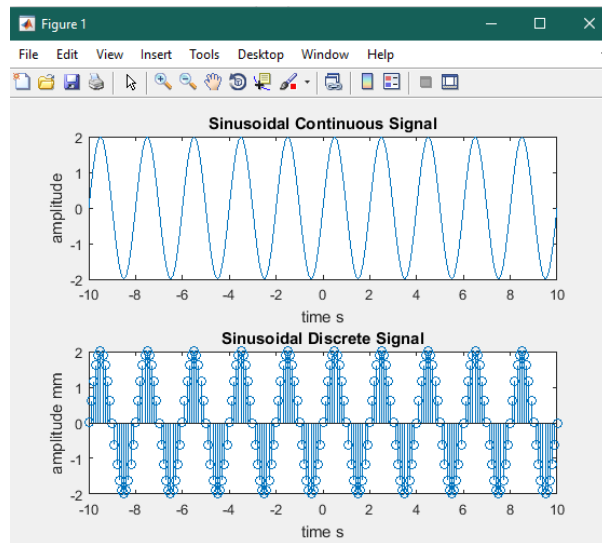


Task 5: Sinusoidal signal

Code:

```
clc;  
clear;  
close all;  
  
% Sinusoidal Signal  
time = -10:0.1:10;  
frequency = 0.5;  
amplitude = 2;  
sinusoidalSignal = amplitude * sin(2*pi*frequency*time);  
  
subplot(2, 1, 1)  
plot(time, sinusoidalSignal);  
xlabel('time s');  
ylabel('amplitude');  
title('Sinusoidal Continuous Signal');  
  
subplot(2, 1, 2)  
stem(time, sinusoidalSignal);  
xlabel('time s');  
ylabel('amplitude mm');  
title('Sinusoidal Discrete Signal')
```

Output:



Task 6: Triangular Signal

Code:

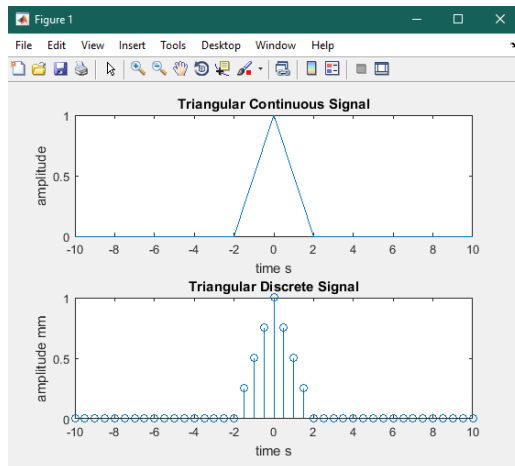
```
clc;
clear;
close all;

% Triangular Signal
time = -10:0.5:10;
base = 2;
x1 = 1 - abs(time) / 2;
x2 = 0;
triangularSignal = x1 .* (abs(time) <= base) + x2 .*
(abs(time)>base);

subplot(2, 1, 1)
plot(time, triangularSignal);
xlabel('time s');
ylabel('amplitude');
title('Triangular Continuous Signal');

subplot(2, 1, 2)
stem(time, triangularSignal);
xlabel('time s');
ylabel('amplitude mm');
title('Triangular Discrete Signal')
```

Output:



Task 7: Signum Signal

Code:

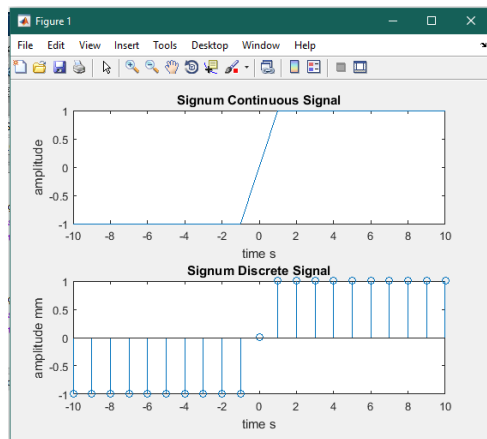
```
clc;
clear;
close all;

% Signum Signal
time = -10:1:10;
signumSignal = [-ones(1, 10) 0 ones(1,10)];

subplot(2, 1, 1)
plot(time, signumSignal);
xlabel('time s');
ylabel('amplitude');
title('Signum Continuous Signal');

subplot(2, 1, 2)
stem(time, signumSignal);
xlabel('time s');
ylabel('amplitude mm');
title('Signum Discrete Signal')
```


Output:



Task 3: Sinc Signal

Code:

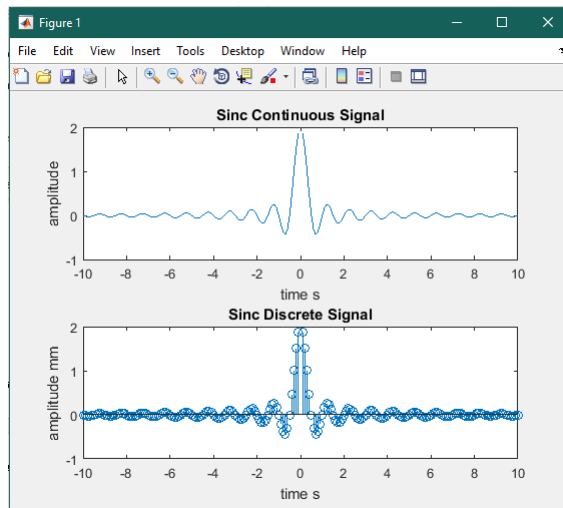
```
clc;
clear;
close all;

% Sinc Signal
time = -10:0.1:10;
frequency = 1;
sincSignal = sin(2*pi*frequency*time) ./ (pi * time);

subplot(2, 1, 1)
plot(time, sincSignal);
xlabel('time s');
ylabel('amplitude');
title('Sinc Continuous Signal');

subplot(2, 1, 2)
stem(time, sincSignal);
xlabel('time s');
ylabel('amplitude mm');
title('Sinc Discrete Signal')
```

Output:



Reference:

To view my codes, please refer to my [GitHub Account](#).

Conclusion:

In This lab I have learnt how to generate and then plot various important signals using MATLAB. I have also learnt characteristics of each signal.

The End.