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Signal Processing Lab

Subject- Digital Signal Processing

EXPERIMENT NO. 4

Aim: To generate discrete time signals using Scilab and Python.

Software Used: Scilab/Python.

Code:

a) Python:

```
import numpy as np
import matplotlib.pyplot as plt
from scipy import signal as sg
import warnings
warnings.filterwarnings('ignore')


n = np.linspace(0, 100, 100)
A = 2
f0 = 5
plt.subplot(2,1,1)
x = A*np.cos(2*np.pi*f0*n)
plt.stem(n,x)
plt.subplot(2,1,2)
y = A*np.sin(2*np.pi*f0*n)
plt.stem(n,y)
```

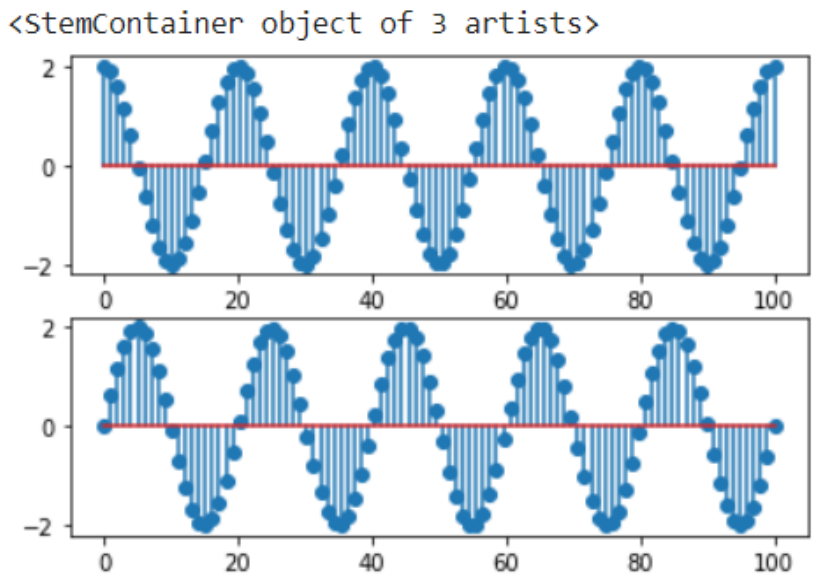
b) Scilab:

```
//
clc;
clear all;
close;

//sinusoidal signal
n1 = 0:0.04:1;
x1 = sin(2*%pi*n1);
subplot(3,2,1);
plot2d3(n1,x1);
title('sine signal')
xlabel('Time')
ylabel('Amplitude')
```

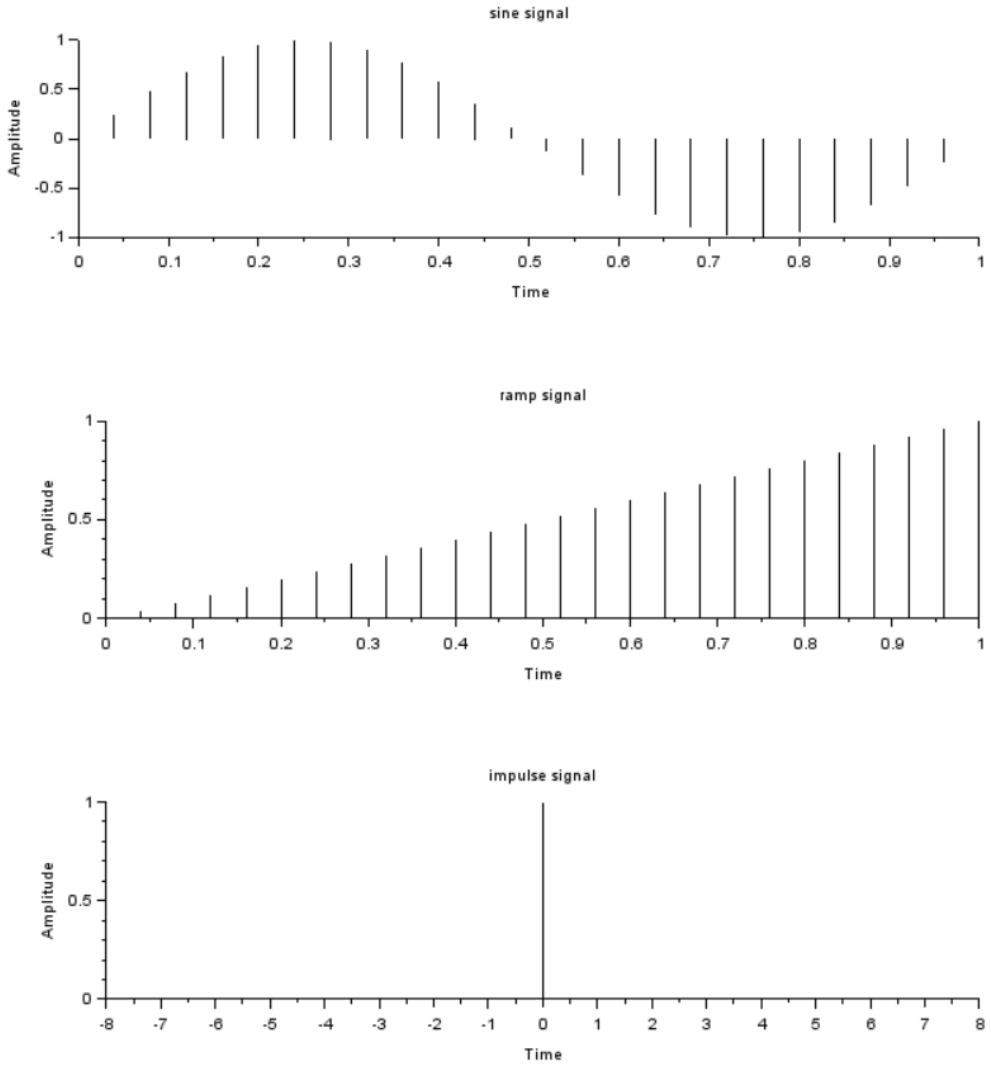
```
//cosine signal
n2 = 0:0.04:1;
x2 = cos(2*%pi*n2);
subplot(3,2,2);
plot2d3(n2,x2);
title('cosine signal')
xlabel('Time')
ylabel('Amplitude')

//ramp signal
n3 = 0:0.04:1;
x3 = n3;
subplot(3,2,3);
plot2d3(n3,x3);
title('ramp signal')
xlabel('Time')
ylabel('Amplitude')

//random signal
n4 = 0:0.04:1;
x4 = rand(n4);
subplot(3,2,4);
plot2d3(n4,x4);
title('random signal')
xlabel('Time')
ylabel('Amplitude')

//impulse signal
N = 7;
n5 = -7:7;
x5 = [zeros(1,N), ones(1,1), zeros(1,N)];
subplot(3,2,5);
plot2d3(n5,x5);
title('impulse signal')
xlabel('Time')
ylabel('Amplitude')
```

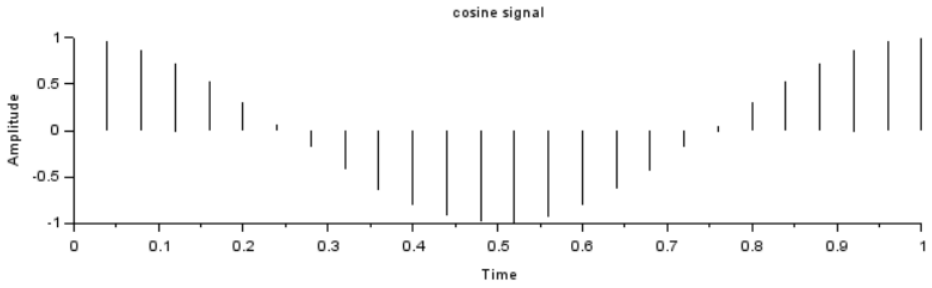
Output:

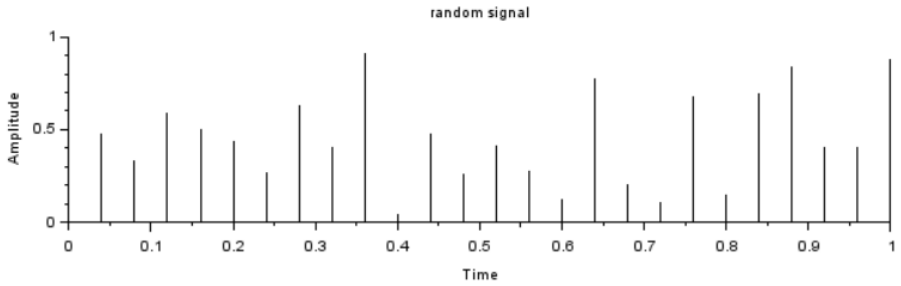
a) Python:



b) Scilab:







Conclusion:

In this experiment we learnt to generate various discrete signals using Scilab and Python in Google Colab Environment.