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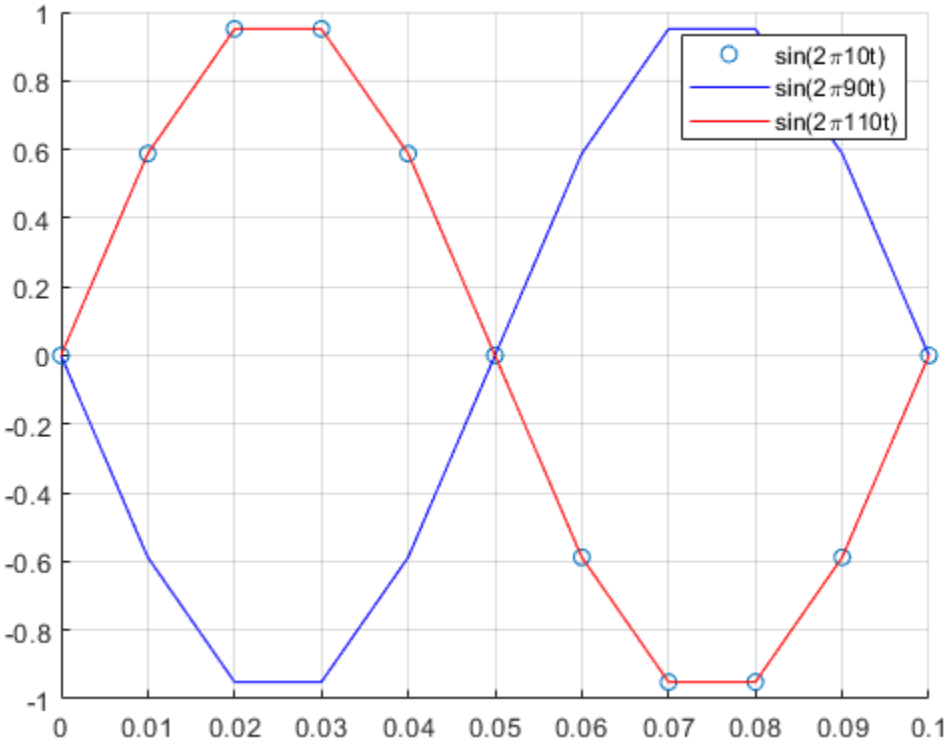
Laboratory 10

```
clc
clear all

%We choose a frequency of 10hz
t = 0:0.01:0.1;

%We are generating the 3 frequencies and seeing the differences
f1 = sin(2*pi*10*t);
f2 = sin(2*pi*90*t);
f3 = sin(2*pi*110*t);

hold
plot(t,f1,'o');
plot(t,f2,'b-');
plot(t,f3,'r-');
grid;shg
legend('sin(2\pi10t)','sin(2\pi90t)','sin(2\pi110t)')
```

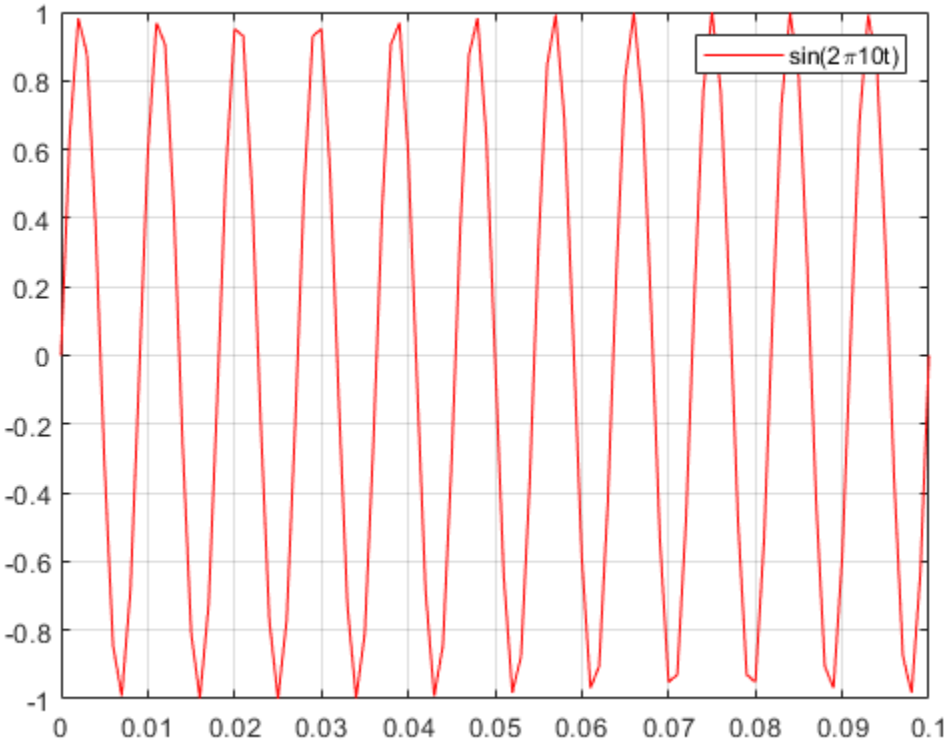
Current plot held



We choose a frequency 10 times smaller than the initial one

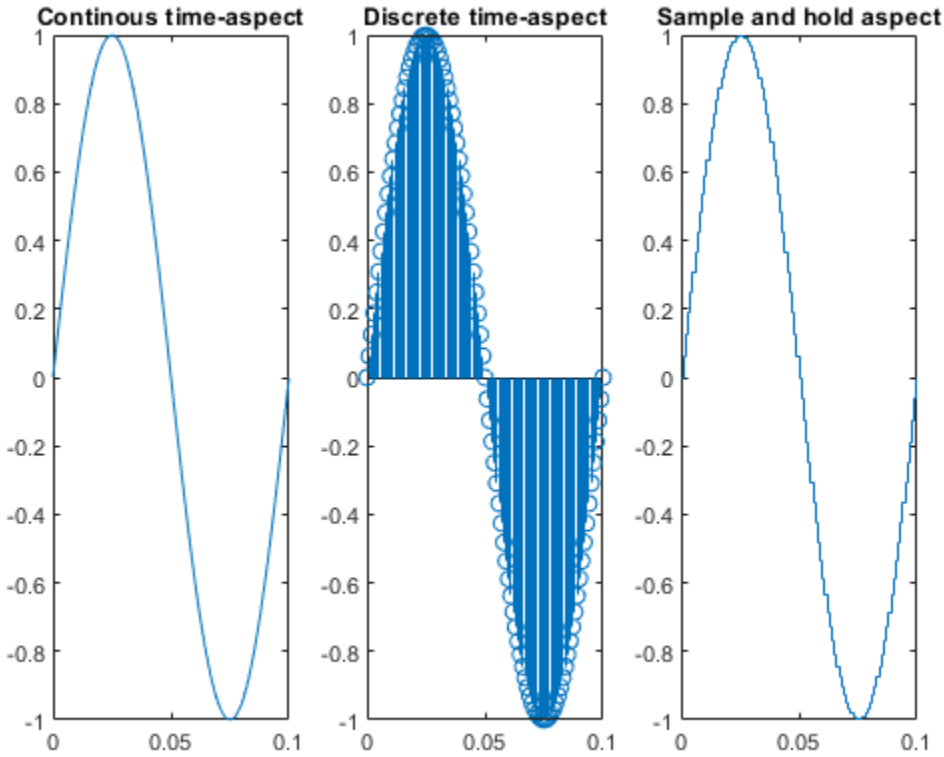
```
clc
clear all
t = 0:0.001:0.1;

%We are generating the 3 frequencies and seeing the differences
%with our new frequency
f1 = sin(2*pi*10*t);
f2 = sin(2*pi*90*t);
f3 = sin(2*pi*110*t);

hold
plot(t,f1,'black');
plot(t,f2,'b-');
plot(t,f3,'r-');
grid;shg
legend('sin(2\pi10t)','sin(2\pi90t)','sin(2\pi110t)');
```

```
Current plot released
Warning: Ignoring extra legend entries.
```



Here we will make the difference between the discrete and continuous time aspect

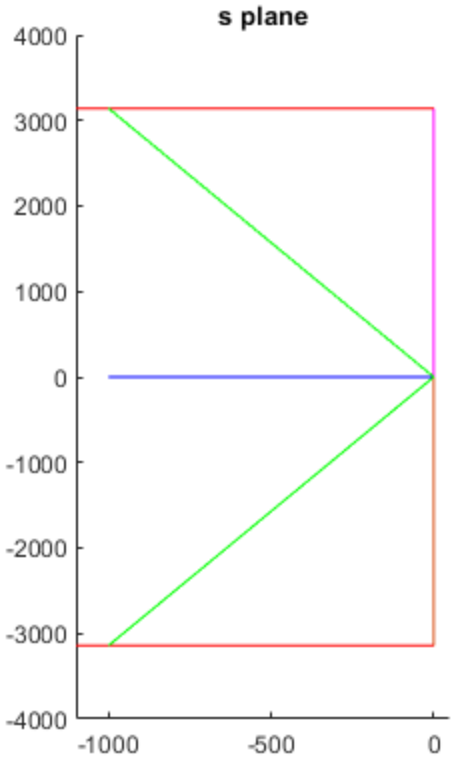
```
clc
clear all
t = 0:0.001:0.1;
f = sin(2*pi*10*t);

subplot(131);
plot(t,f);
title('Continous time-aspect')
subplot(132);
stem(t,f);
title('Discrete time-aspect')
subplot(133);
stairs(t,f);
title('Sample and hold aspect')
```

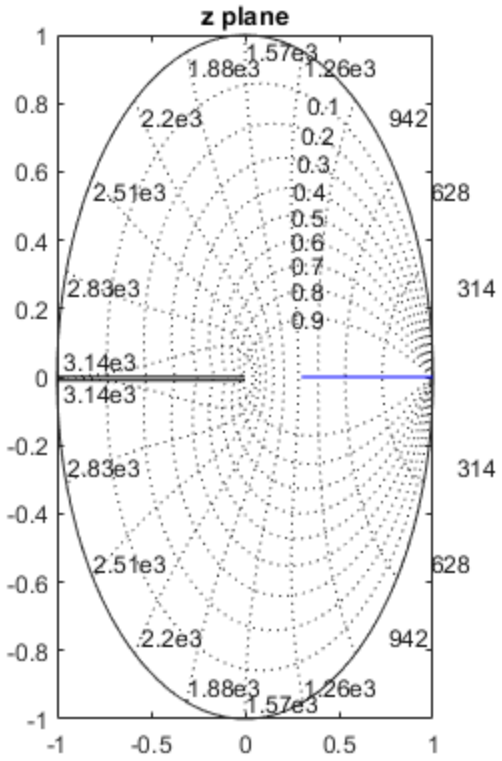



```
clc
clear all

%Here lies the s plane
Ts = 0.001;
subplot(121)
hold
axis([-1100,50 -4000 4000])
plot([0 0],[0 pi/Ts],'m-');
plot([0 0],[0 -pi/Ts]);
plot([-1100 0],[pi/Ts pi/Ts],'red');
plot([-1100 0],[-pi/Ts -pi/Ts],'red');
plot([-1000 0],[0 0],'blue');
plot([-1000 0],[pi/Ts 0],'green');
plot([-1000 0],[-pi/Ts 0],'green');
title('s plane');

%The construction of the z plane
subplot(122)
hold
axis([-1 1 -1 1]);
plot([0.3 1],[0 0 ],'blue');
plot([-1 0],[Ts Ts],'black');
plot([-1 0],[-Ts*10 -Ts*10],'black');
```

```
zgrid(Ts);
title('z plane')
```

Current plot held
Current plot held





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