1. CONTINUOUS AND DISCRETE SIGNALS:

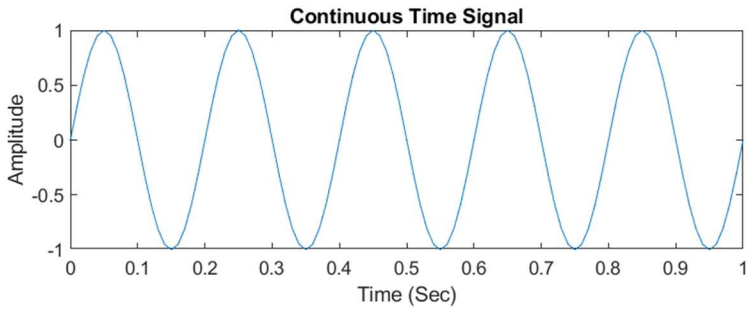
CODE:

```
%Continuous and discrete signals

fs = 100;
t = 0 : 1 / fs : 1;
f = 5;
x = sin(2 * pi * f * t);

subplot(211);
plot(t, x);
title('Continuous Time Signal');
xlabel('Time (Sec)');
ylabel('Amplitude');

subplot(212);
stem(t, x);
title('Discrete Signal Time');
xlabel('Time (Sec)');
ylabel('Amplitude');
```

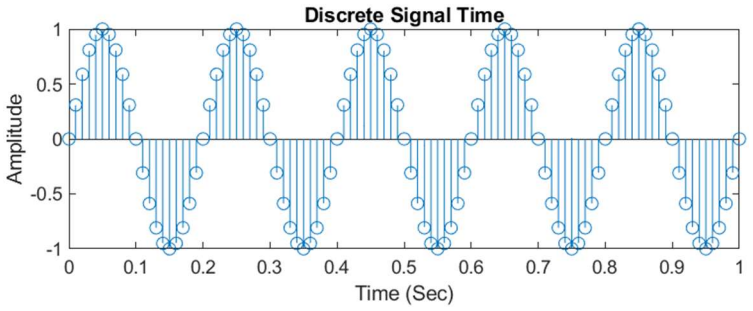
RESULT:

OUTPUT WAVEFORMS:

Continuous Time Signal



Discrete Time Signal



2. DETERMINISTIC AND RANDOM SIGNALS:

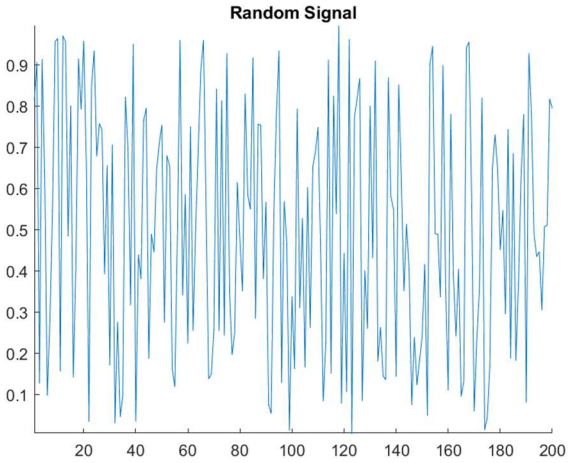
CODE:

```
%RANDOM SIGNAL

sig_length = 200;
hold on
sig = rand(1, sig_length);
plot(1 : sig_length, sig)
axis tight
title('Random Signal')
```

RESULT:

OUTPUT WAVEFORM:

Random Signal

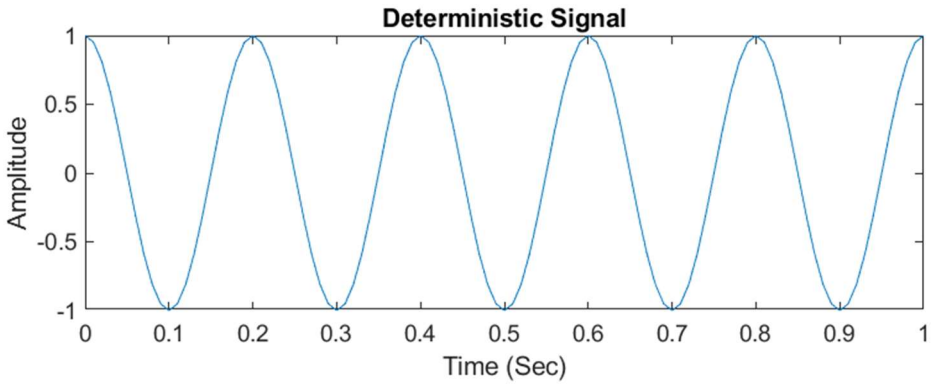


CODE:

```
%Deterministic signal

fs = 100;
t = 0 : 1 / fs : 1;
f = 5;
x = cos(2 * pi * f * t);

subplot(211);
plot(t, x);
title('Deterministic Signal');
xlabel('Time (Sec)');
ylabel('Amplitude');
```

OUTPUT WAVEFORM:

Deterministic Signal

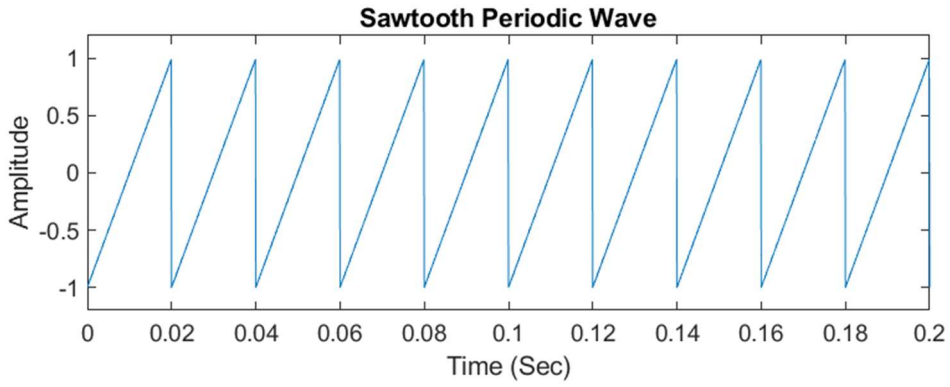

Deterministic Signal
Amplitude
Time (Sec)
1
0.5
0
-0.5
-1
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

3. PERIODIC AND APERIODIC SIGNALS:

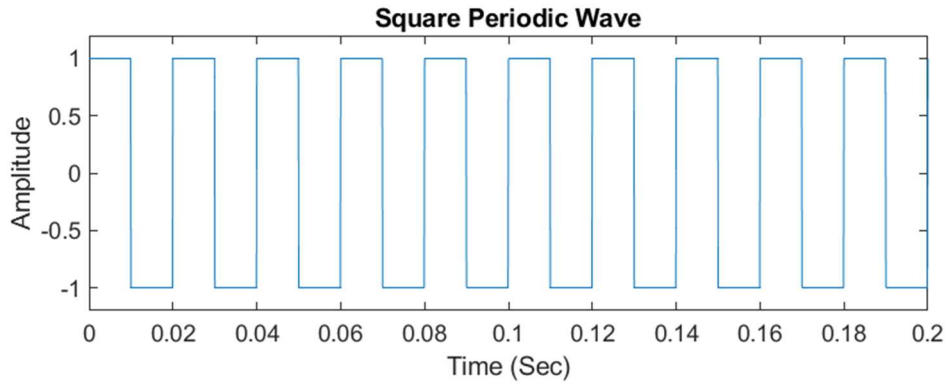
CODE:

```
% Periodic signal
fs = 10000;
t = 0 : 1 / fs : 1.5;
x1 = sawtooth(2 * pi * 50 * t);
x2 = square(2 * pi * 50 * t);

subplot(211)
plot(t, x1)
axis([0 0.2 -1.2 1.2])
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Sawtooth Periodic Wave')

subplot(212)
plot(t, x2)
axis([0 0.2 -1.2 1.2])
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Square Periodic Wave')
```

OUTPUT WAVEFORMS:
Sawtooth Periodic Wave



Square Periodic Wave

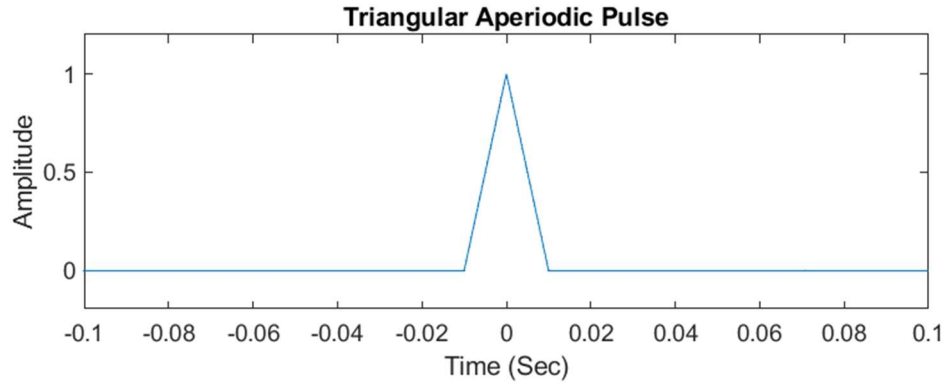


CODE:

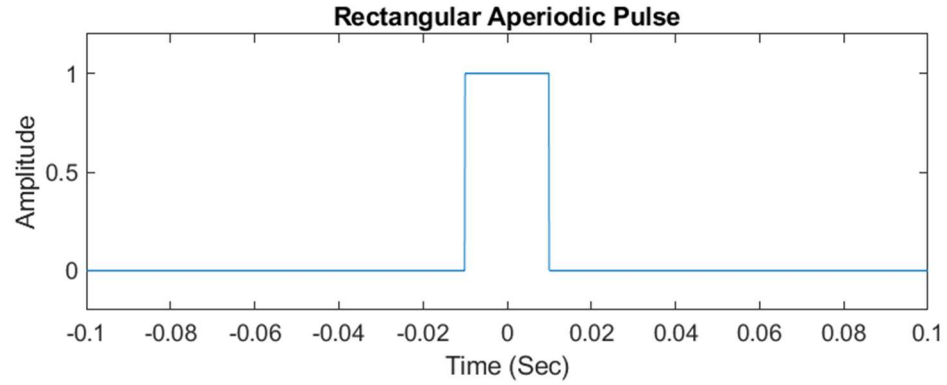
```
%Aperiodic

fs = 10000;
t = -1 : 1 / fs : 1;
x1 = tripuls(t, 20e-3);
x2 = rectpuls(t, 20e-3);

figure
subplot(211)
plot(t, x1);
axis([-0.1 0.1 -0.2 1.2])
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Triangular Aperiodic Pulse')

subplot(212)
plot(t, x2);
axis([-0.1 0.1 -0.2 1.2])
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Rectangular Aperiodic Pulse')
```

OUTPUT WAVEFORMS:

Triangular Aperiodic Pulse



Rectangular Aperiodic Signal



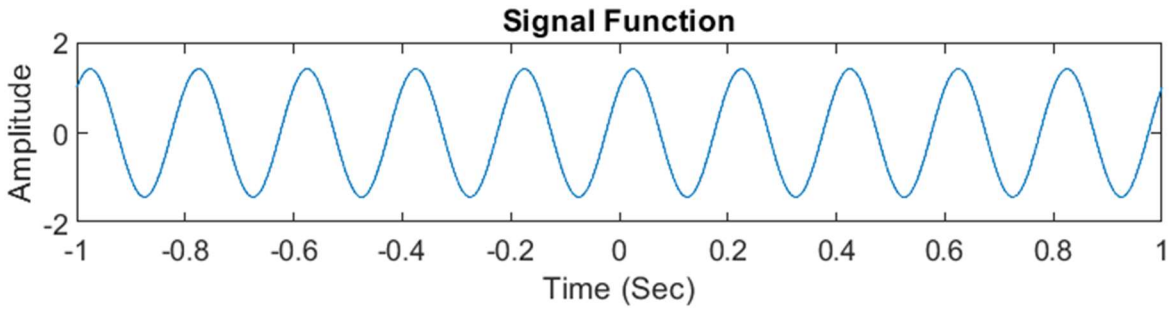
4. EVEN AND ODD SIGNALS:

CODE:

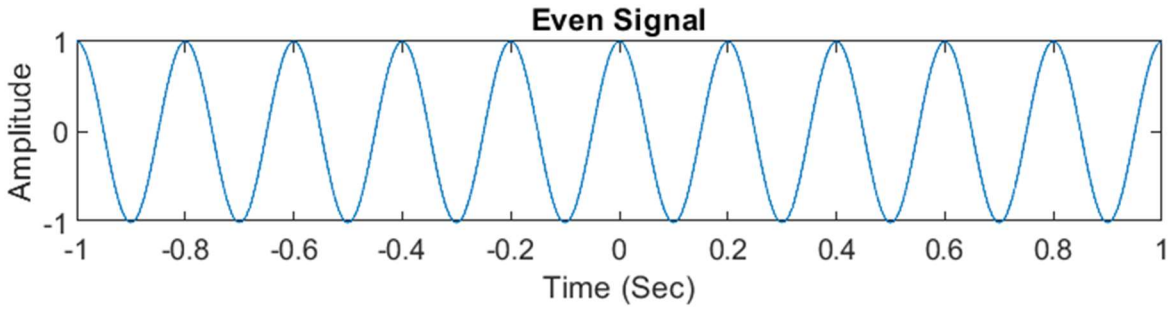
```
t = -1 : 0.0001 : 1;
f = 5;
x = sin(2 * pi * f * t) + cos(2 * pi * f * t);
y = sin(2 * pi * f * (-t)) + cos(2 * pi * f * (-t));

subplot(311);
plot(t, x);
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Signal Function');

even = (x + y) / 2;

subplot(312);
plot(t, even);
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Even Signal');

odd = (x - y) / 2;
subplot(313);
plot(t, odd);
xlabel('Time (Sec)');
ylabel('Amplitude');
title('Odd Signal');
```

RESULT:

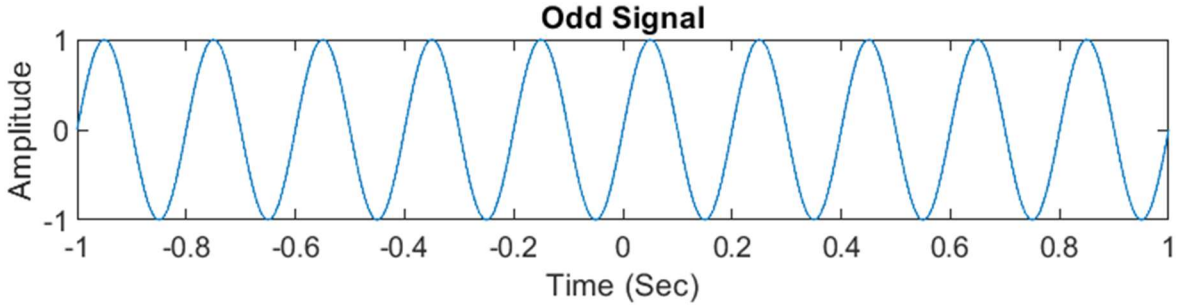
Given Signal



Even Signal


Even Signal
Amplitude
1
0
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
Time (Sec)

Odd Signal


Odd Signal
Amplitude
1
0
-1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
Time (Sec)

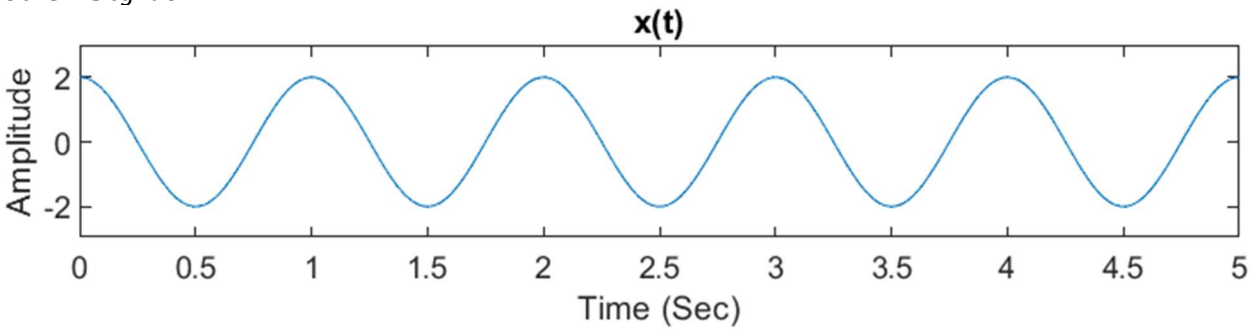
5. REAL AND IMAGINARY SIGNALS:

CODE:

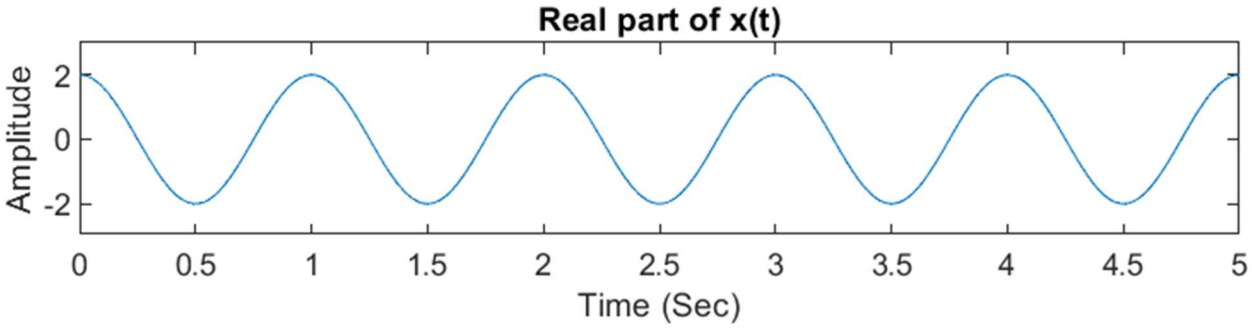
```
%Real and imaginary signals

t = 0 : 0.01 : 5 ;
A = 2;
x = A * (cos(2 * pi * t) + 1i* sin(2 *pi*t));

subplot(311);
plot(t, x)
axis([0 5 -3 3])
xlabel('Time (Sec)')
ylabel('Amplitude')
title('x(t)')

subplot(312);
plot(t, real(x))
axis([0 5 -3 3])
xlabel('Time (Sec)')
ylabel('Amplitude')
title('Real part of x(t)')

subplot(313);
plot(t, imag(x))
axis([0 5 -3 3])
xlabel('Time (Sec)')
ylabel('Amplitude')
```

Result:

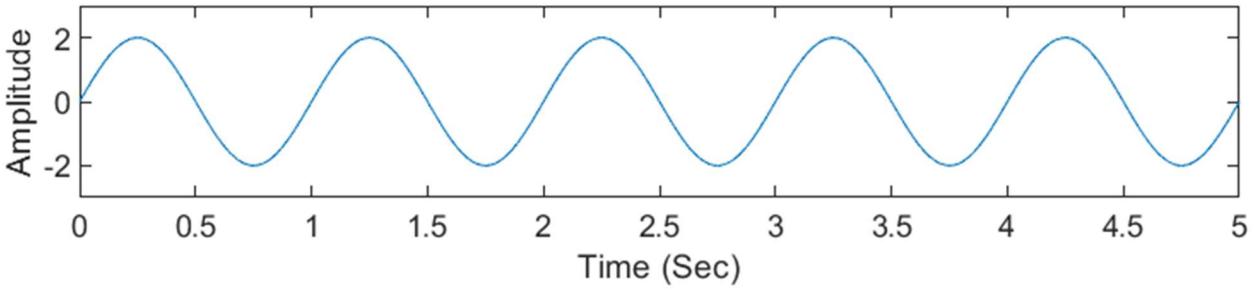
Given Signal



Real Signal



Imaginary Signal



6. Energy and Power Signal:

Code:

```
fs = 100;
syms t;
syms x;
%T = -5 : 1 / fs : 5;

x1 = heaviside(x);
e = limit(int(x1, -t, t), t, inf);
p = limit(int(x1, -t, t) * (t / 2), t, inf);

if(e == inf && p == 0|| e == inf && p == inf)
    disp("Signal is Neither Energy nor Power Signal");
elseif(e == inf)
        disp("Signal is a Power Signal");
        disp(p);
else
    disp("Signal is a Energy Signal");
    disp(e);
end
```

RESULT:

>> EnergyPower

Signal is Neither Energy nor Power Signal