Analog Periodic and Analog Aperiodic Signal

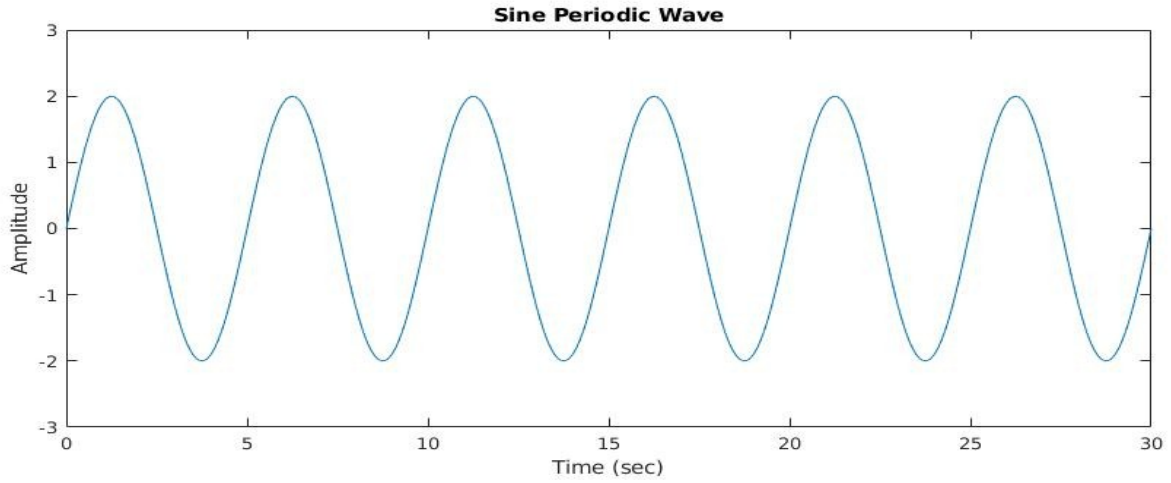
1. Source Code

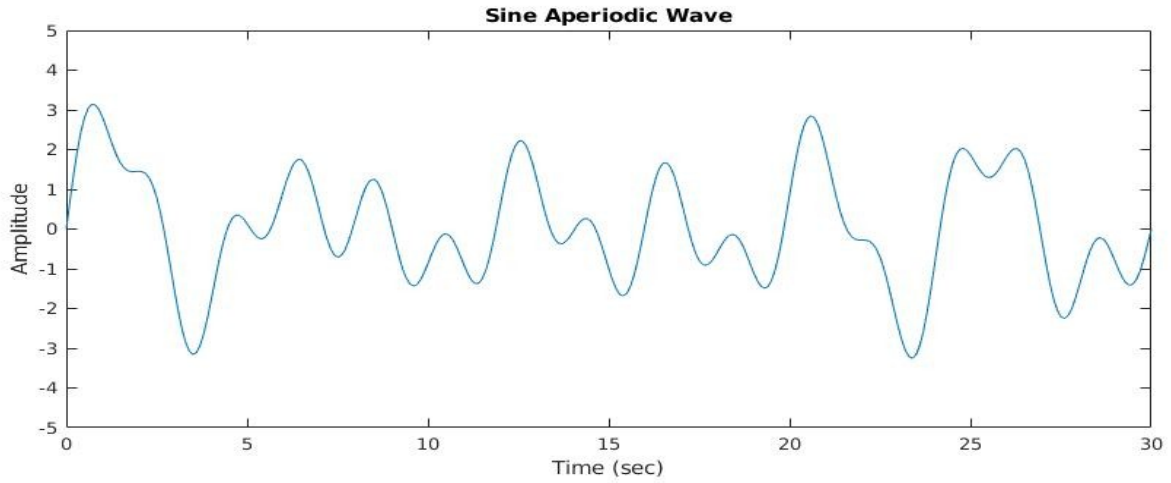
```
amplitude = 2;
[u,t] = gensig('sine',5,30,0.1);

subplot(2,1,1)
plot(t, amplitude*u);
axis([0 30 -1.5*amplitude 1.5*amplitude]);
xlabel('Time (sec)');
ylabel('Amplitude');
title('Sine Periodic Wave');

subplot(2,1,2)
[v1,t] = gensig('sine',4,30,0.1);
[v2,t] = gensig('sine',2,30,0.1);
[v3,t] = gensig('sine',6,30,0.1);
plot(t, u+v3+v2+v1);
axis([0 30 -5 5]);
xlabel('Time (sec)');
ylabel('Amplitude');
title('Sine Aperiodic Wave');
```

2. Observation





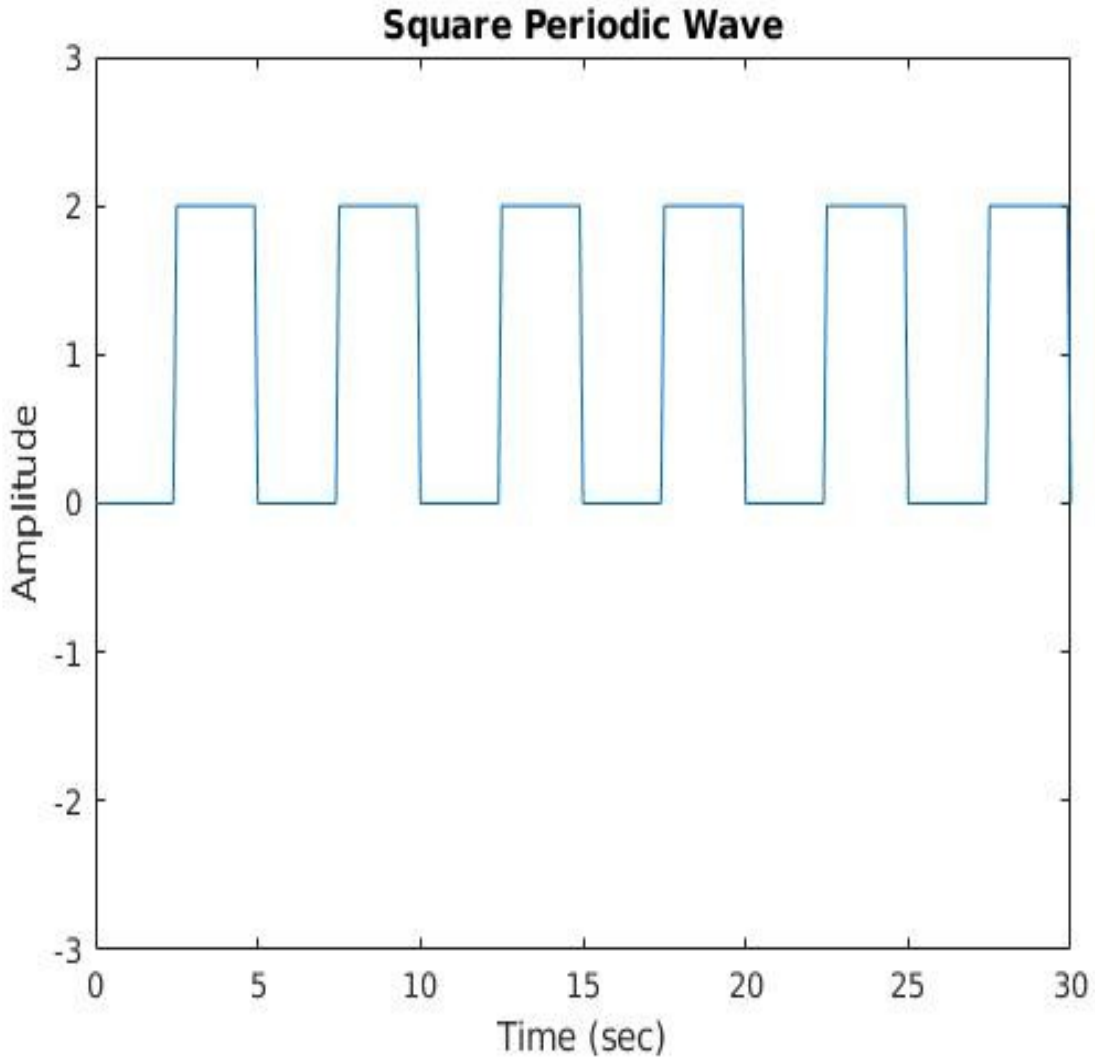
Generate Digital Signal

1. Source Code – Periodic Digital Signal

```
amplitude = 2;
[u,t] = gensig('square',5,30,0.1);

plot(t, amplitude*u);
axis([0 30 -1.5*amplitude 1.5*amplitude]);
xlabel('Time (sec)');
ylabel('Amplitude');
title('Square Periodic Wave')
```

2. Observation



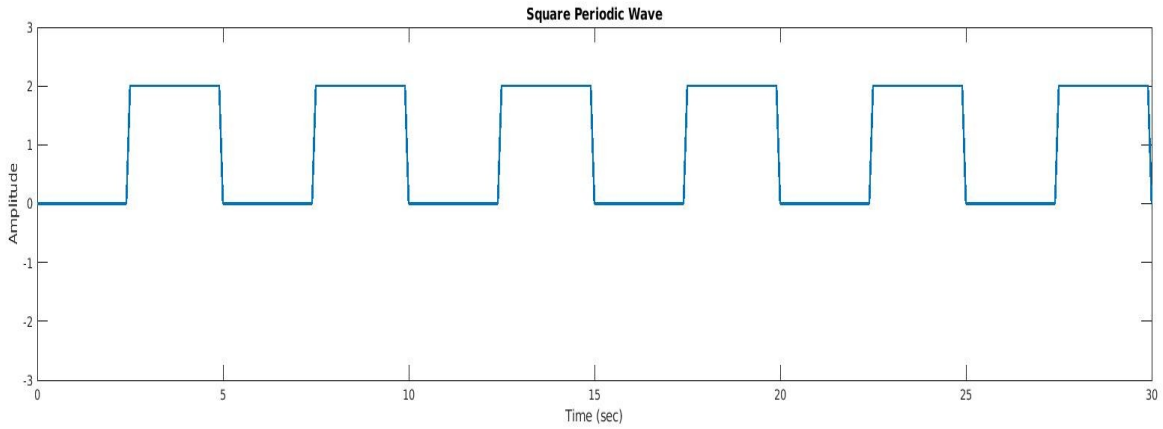
3. Source Code – Aperiodic Digital Signal

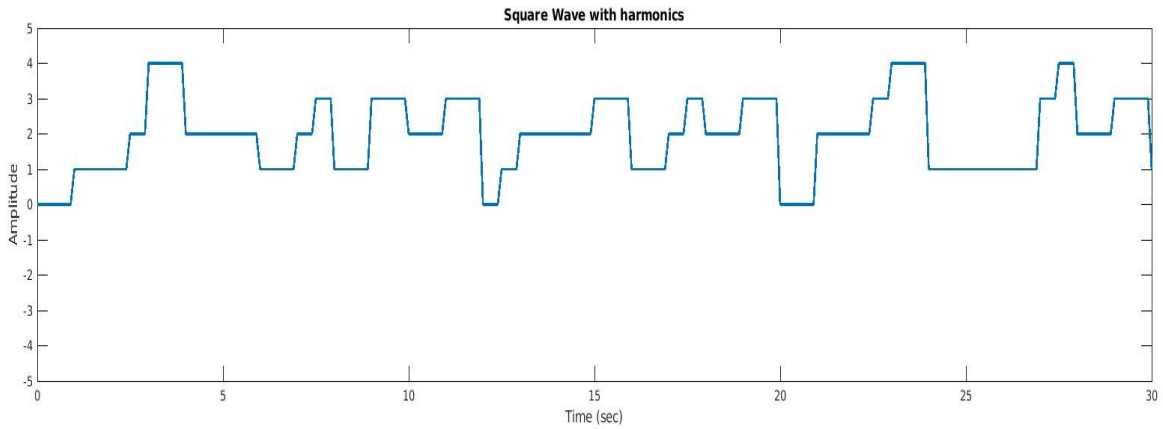
```
amplitude = 2;
[u,t] = gensig('square',5,30,0.1);

subplot(2,1,1)
plot(t, amplitude*u,'LineWidth', 2 );
axis([0 30 -1.5*amplitude 1.5*amplitude]);
xlabel('Time (sec)');
ylabel('Amplitude');
title('Square Periodic Wave');

subplot(2,1,2);
[v1,t] = gensig('square',4,30,0.1);
[v2,t] = gensig('square',2,30,0.1);
[v3,t] = gensig('Square',6,30,0.1);
plot(t, u+v3+v2+v1, 'LineWidth', 2);
axis([0 30 -5 5]);
xlabel('Time (sec)');
ylabel('Amplitude');
title('Square Wave with harmonics');
```

4. Observation





Generate analog signal with noise

1. Source Code

```
% generate raw sine signal
[x,t] = gensig('sine',5,30,0.1);

% add Gaussian white noise using awgn()
y = awgn(x,0.01,'measured');

% Plot the signals
plot(t,[x y],'LineWidth',1.5)
legend('Original Signal','Signal with AWGN')
xlabel('Time (sec)');
ylabel('Amplitude');
```

2. Observation