

## Experiment 2(a)

**Title:** Write the codes to plot the following signals also simulate the signals:

- a)  $\sin(200 \pi t)$
- b)  $\sin(200 \pi t + \frac{\pi}{6})$
- c)  $\sin(200 \pi t - \frac{\pi}{6})$
- d)  $\cos(200 \pi t)$
- e)  $\cos(200 \pi t + \frac{\pi}{4})$
- f)  $\cos(200 \pi t - \frac{\pi}{6})$

### Learning Objectives

- i) To understand basic standard signals
- ii) To have hands on simulation using python language

### Prerequisites

- i) Basic understanding of mathematics
- ii) Basic understanding of Python language

### Theory

### Simulation Code

```
import numpy as np
import matplotlib.pyplot as plt

Fs = samples = 10000
n = np.arange(samples)
t = n/samples

f1 = 200
f2 = 200

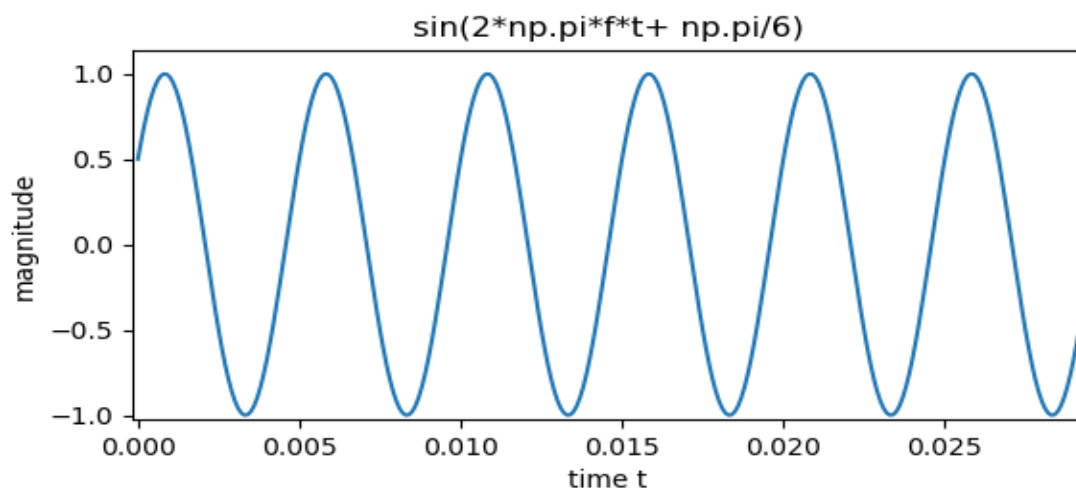
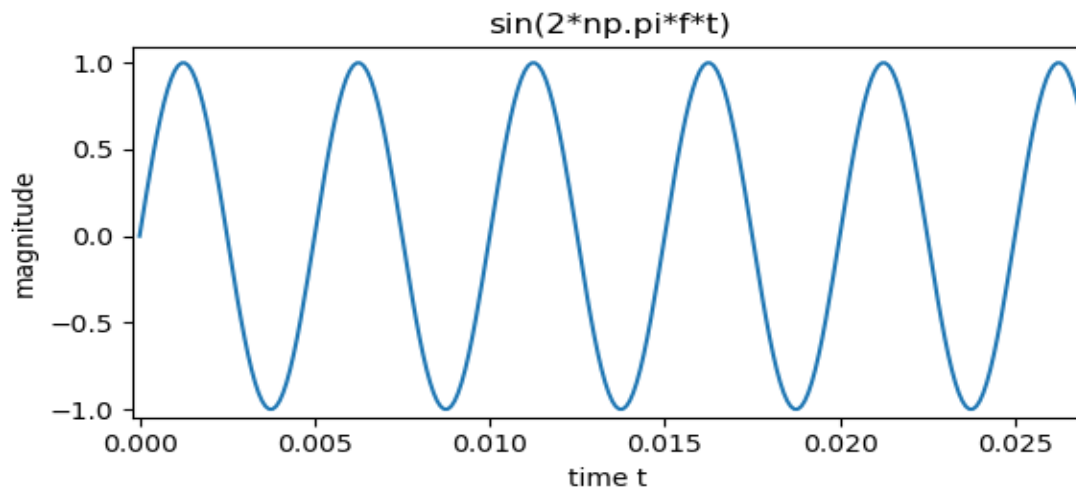
x = np.sin(2*np.pi*f1*t)
x1 = np.sin(2*np.pi*f2*t + np.pi/6)

plt.subplot(2,1,1)
plt.plot(t, x)
plt.title('sin(2*np.pi*f*t)')
plt.xlabel('time t')
plt.ylabel('magnitude')

plt.subplot(2,1,2)
plt.plot(t, x1)
```

```
plt.title('sin(2*np.pi*f*t+ np.pi/6)')  
plt.xlabel('time t')  
plt.ylabel('magnitude')
```

```
plt.show()
```



### Assignment

**Task1:** Write description for codes

**Task2:** Vary the parameters of the signals and observe the magnitude and phase spectrum