B10402123 葉澤賢 四電子四乙

Digital Single Lab6

1.

```
In [56]: import matplotlib.pyplot as plt

         x_data = [20, 40, 60, 80]
         y_data = [1, 2, 3, 4]

         fig = plt.figure(figsize = (15, 3))
         ax = fig.add_subplot(1, 1, 1)
         ax.set_xlabel('angle')
         ax.set_ylabel('amplitude')

         li = []
         x = []
         y = []
         with open('Lab6_cos_wave.txt', 'r') as line:
             for i in line:
                 li.append(i.split())
         for i in li:
             x.append(int(i[0]))
             y.append(float(i[1]))

         ax.plot(x, y, label='Cosine Wave')
```

```
li = []
x1 = []
y1 = []
with open('Lab6_sin_wave.txt', 'r') as line:
    for i in line:
        li.append(i.split('\t'))
for i in li:
    x1.append(int(i[0]))
    y1.append(float(i[1].replace('\n', '')))
print(x1, y1)

ax.plot(x1, y1, label='Sine Wave')

ax.legend()
plt.show()
```

[0, 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 52
0, 540] [0.0, 0.342020143, 0.64278761, 0.866025404, 0.984807753, 0.984807753, 0.866025404, 0.64278761, 0.342020143, 1.22515e-1
6, -0.342020143, -0.64278761, -0.866025404, -0.984807753, -0.984807753, -0.866025404, -0.64278761, -0.342020143, -2.4503e-16,
0.342020143, 0.64278761, 0.866025404, 0.984807753, 0.984807753, 0.866025404, 0.64278761, 0.342020143, 3.67545e-16]
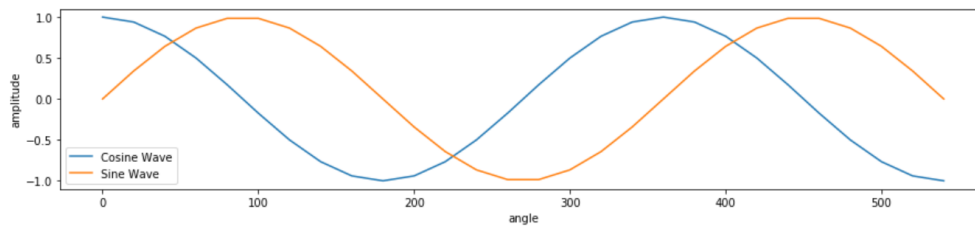
2.

```
In [66]:  fig = plt.figure(figsize = (15, 10))
          ax = fig.add_subplot(2, 1, 1)
          ax.set_xlabel('angle')
          ax.set_ylabel('amplitude')
          ax.set_title('Sine Wave')

          ax.plot(x, y, label='Cosine Wave')
          ax.legend()

          ax = fig.add_subplot(2, 1, 2)
          ax.set_xlabel('angle')
          ax.set_ylabel('amplitude')
          ax.set_title('Cosine Wave')

          ax.plot(x1, y1, label='Sine Wave')

          ax.legend()
          plt.show()
```