

Autumn Term, Week 10 Tutorial  
Jiachen Jiang

Read the following sections of University Physics and lectures.

2D waves and Python Programming

Similar to Exercise-8 on the “Maths for Waves” Worksheet, consider a 2D wave of  $z = \cos(\mathbf{k} \cdot \mathbf{r} - \omega t)$ ,  $\mathbf{k}$  is the wave factor,  $\mathbf{k} = (k_1, k_2)$ ;  $\mathbf{r}$  is the position of a point,  $\mathbf{r} = (x, y)$ ;  $\omega = 2\pi/T$  is the angular frequency of the wave.

Write a Python program to visualise the wave at  $t=0, 1/4T, 1/2T, 3/4T$  by given  $k_1$  and  $k_2$ .