Homework 2 (Due: 4/12)

(1) Write a Matlab or Python code that uses the frequency sampling method to design a $(2k+1)$-point discrete differentiation filter $H(F) = j2\pi F$ when $-0.5 < F < 0.5$ (k is an input parameter and can be any integer). (25 scores)

The transition band is assigned to reduce the error (unnecessary to optimize). (i) The impulse response and (ii) the imaginary part of the frequency response (DTFT of $r[n]$, see pages 113 and 114) of the designed filter should be shown. The code should be handed out by NTU Cool.