


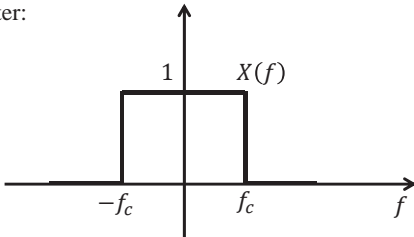
# Part II: Homework



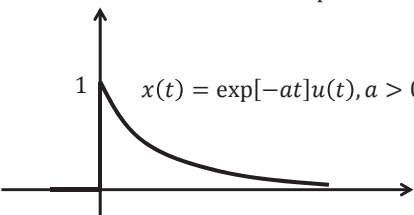
信息科学与技术学院  
School of Information Science and Technology

## HW Problems

- Find the time domain signal that has the following Fourier Transform, which is called Low-Pass Filter:
 



$$x(t) = \int_{-\infty}^{+\infty} X(f)e^{j2\pi ft} df$$
- Find the Fourier Transform of the one-sided exponential signal.
 





## HW Problems

3. Find the Discrete Fourier Transform of the following signals:

3.a  $x(n) = \delta(n - 1), n = 0, 1, \dots, N - 1$

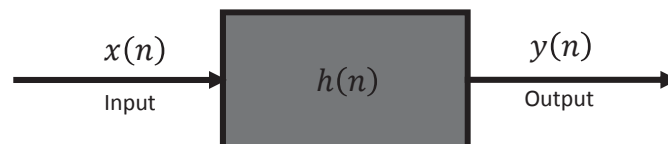
3.b  $x(n) = a^n, n = 0, 1, \dots, N - 1$

3.c  $x(n) = \sin(2\pi f_0 n), n = 0, 1, \dots, N - 1$



## HW Problems

4. Let  $y(n)$  be the filtering output when inputting  $x(n)$ , determine the output with the following inputs:



4.a  $x(n - n_0), n_0$  is a fixed natural number

4.b  $ax(n), a$  is a fixed real number

4.c  $x(n) = e^{j2\pi f_0 n}, f_0$  is a fixed real number