Computational Photography (CSCI 3240U) — In-class Exercise

Please hand in this paper to the instructor before the end of the lecture.

Lastname (PRINT):	_____	Firstname:	_____
Student number:	_____	Date:	_____

Q. A causal Finite Impulse Response (FIR) filter is defined by

$$y[n] = \frac{1}{5} \sum_{k=-2}^{2} x[n-k] f[k].$$

$f[k] = [1,1,1,1,1]\frac{1}{5}$ ave. filter

Compute $y[n]$ for input $x[n] = [2, -1, 0, 3, 1, 0]$. Assume $x[n]$ is 0 outside given samples.

n 0 1 2 3 4 5

x[3] = 3 ✓
x[5] = 0 ✓

$$y[0] = \frac{1}{5}\left(x[0+2] + x[0+1] + x[0+0] + x[0-1] + x[0-2]\right) =$$

$$= \frac{1}{5}\left(0 + (-1) + 2 + 0 + 0\right) = \frac{1}{5}$$