## Random Walk Algorithms: Homework 4

1. Write code to "blur" a 1D "greyscale image" on $\mathbb{Z} / 128 \mathbb{Z}$, i.e., $\vec{u}_{0} \in\{0,1, \ldots, 255\}^{128}$, using $B^{t}$ where $B=\left(X+2 I+X^{-1}\right) / 4$. That is, pixel $s$ in the "blurred image" is $\left\lfloor\left(B^{t} \vec{u}_{0}\right)_{s}\right\rceil \in\{0,1, \ldots, 255\}$. Plot two examples to illustrate that your code is working as it should, for different values of $t$.
2. Write code to "unblur" the output of your blurring code, without using the original "image".
a. First do it assuming that you know which $t$ was used, i.e., that the image was blurred by $B^{t}$ for the correct $t$.
b. Plot the results of unblurring the examples you showed in problem 1 and compare them with the originals.
c. Second, suggest a strategy for unblurring if you don't know $t$.
