

**Transposed Convolutions***(find and work with a partner)*

1. *Transposed Convolutions.* Say the following input is random noise and we wish to create a large image.

input	filter	output																													
<table border="1"><tr><td>3</td><td>-1</td></tr><tr><td>2</td><td>0</td></tr></table>	3	-1	2	0	<table border="1"><tr><td>2</td><td>-2</td><td>1</td></tr><tr><td>0</td><td>5</td><td>2</td></tr><tr><td>1</td><td>0</td><td>-3</td></tr></table>	2	-2	1	0	5	2	1	0	-3	<table border="1"><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table>																
3	-1																														
2	0																														
2	-2	1																													
0	5	2																													
1	0	-3																													

- (a) Add zero padding of size 2 all the way around the input.
- (b) With stride 1, slide the filter over the input to compute the output (i.e. using element-wise dot-products).