Name:

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The input to a linear time invariant system is x[n] = {1, 0, -1, 0, 1}. Assume the signal starts at t = 0 (x[0] = 1). The system’s impulse response is h[n] = {2, 0, -2}. Assume the impulse response starts at t = 0 also (h[0] = 2). Calculate the output of the system.

Recall: 

You can solve this in MATLAB using the conv function, or do graphical convolution (flip and slide).

For example:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| n | 1 | 0 | -1 | 0 | 1 | y[n] |
| 0 | 2 |  |  |  |  | 2 |
| 1 | 0 | 2 |  |  |  | 0 |
| 2 | -2 | 0 | 2 |  |  | -4 |
| 3 |  | -2 | 0 | 2 |  | 0 |
| 4 |  |  | -2 | 0 | 2 | 4 |
| 5 |  |  |  | -2 | 0 | 0 |
| 6 |  |  |  |  | -2 | -2 |
| 7 |  |  |  |  |  | 0 |
| 8 |  |  |  |  |  | 0 |
| 9 |  |  |  |  |  | 0 |