Lab 1：Introduction

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| Introduction   1. In the problem 2.4, we verified the commutative, associative and distributive properties of convolution for a specific set of signals. And mainly uses the conv() to solve this problem.   Lab results & Analysis：  Problem 2.4        The figure is shown below      The output results are as below. We can figure out that the answer is regardless of the order.      The two methods gave the same result. So the distributive property is verified.      The results are the same. So the associative property is verified.      As shown below, we can see that when using the commutative property, the outputs are the same if changing the input and impulse response of the system . And we can know that .        We can see from the figure below that .  But it couldn’t prove that the associative property is wrong. The reason is that System 1: y[n] = (n+1)x[n] is not a LTI system. So we can’t apply the associative property.      We can see from the figure below that yg1 is not equal to yg2. But it can’t prove the distributive property of convolution is wrong. The reason is that System 1: is not a LTI system. So we can’t apply the distributive property.    2.5    (a).    2.10          As shown in this figure, he = .      As shown in the figure, z[n] = x[n] is a valid solution. The reason is that y[n] z[n]\*he[n].      As shown in the figure, it is her.      This figure is the sound which cannot hear the echo.      The result is not a unit impulse. The echo removal system should have infinite-length impulse response, but our system is not infinite.      Codes:  2.4  % Problem 2.4(a)  x1 = [1 1 1 1 0 0 0 0 0 0];  nx1 = 0:1:9;  h1 = [1 -1 3 0 1];  h2 = [0 2 5 4 -1];  nh1 = 0:1:4;  subplot(3, 1, 1), stem(nx1, x1), title("x\_1[n]");  subplot(3, 1, 2), stem(nh1, h1), title("h\_1[n]");  subplot(3, 1, 3), stem(nh1, h2), title("h\_2[n]");  saveas(gcf, "plots/P2\_4\_a.png");  close;  Note: Please indicate meaning of the symbols in all expressions. Please indicate the coordinate and unit in all figures. | |
| Experience  You can write your experience with this project. Any comment and suggestion on this course are also very welcome. | |
| Score |  |

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