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                                partition_array_3D
function [N_0, s_0] = partition_array_3D(input_array)
vec_size = size(input_array);
num_cols = vec_size(2);
alpha = .5;
N_0 = max(1,ceil(log2((num_cols)/2)));
N_1 = max(1,ceil((1 - alpha)*N_0));
s_0 = test_entropy_array_3D(input_array, N_0);
s_1 = test_entropy_array_3D(input_array, N_1);
if(s_1 > s_0)
    while(s_1 > s_0 && (ceil((1 - alpha)*N_0) > 1))
        N_0 = N_1;
        N_1 = max(1,ceil((1 - alpha)*N_0));
        s_0 = test_entropy_array_3D(input_array, N_0);
        s_1 = test_entropy_array_3D(input_array, N_1);
    endwhile
else
    N_1 = max(1,ceil((1 + alpha)*N_0));
    s_0 = test_entropy_array_3D(input_array, N_0);
    s_1 = test_entropy_array_3D(input_array, N_1);
    while(s_1 >= s_0 && ceil((1 + alpha)*N_0) <= num_cols)
        N_0 = N_1;
        N_1 = max(1,ceil((1 + alpha)*N_0));
        s_0 = test_entropy_array_3D(input_array, N_0);
        s_1 = test_entropy_array_3D(input_array, N_1);

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partition_array_3D  
    endwhile  
endif  
endfunction
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