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                                generate_data_space
function [X Y Z] = generate_data_space(input_array)
    %takes in an array of 3-space vectors, and returns three vectors that contains the
    min and max elements of each dimension

    [x num_items] = size(input_array);

    min_x = Inf;
    min_y = Inf;
    min_z = Inf;

    max_x = 0;
    max_y = 0;
    max_z = 0;

    for i = 1 : num_items

        temp_item = input_array{i};

        %searches for the minima across all three dimensions

        if(temp_item(1) < min_x)

            min_x = temp_item(1);

        endif

        if(temp_item(2) < min_y)

            min_y = temp_item(2);

        endif

        if(temp_item(3) < min_z)

            min_z = temp_item(3);

        endif

        %searches for the maxima across all three dimensions

        if(temp_item(1) > max_x)

            max_x = temp_item(1);

        endif

        if(temp_item(2) > max_y)

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generate_data_space

    max_y = temp_item(2);
endif

if(temp_item(3) > max_z)
    max_z = temp_item(3);
endif

endfor

X = [min_x max_x];
Y = [min_y max_y];
Z = [min_z max_z];

endfunction
```