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                                display_color_array
function img = display_color_array(color_array, scale_array)
    %returns an image containing the colors in the color_array

    [x num_colors] = size(color_array);
    [x num_items] = size(scale_array);

    total = 0;

    %this will allow us to give more frequent colors a larger share of the resulting
    color bar
    for i = 1 : num_items

        [x temp] = size(scale_array{i});
        scale_vector(i) = temp;
        total = total + temp;

    endfor

    scale_vector = scale_vector/total;

    border = 50;
    max_num_columns = total;
    num_rows = num_colors;
    col_number = 1;

    for i = 1 : num_colors

        num_columns = 2 + ceil(max_num_columns*scale_vector(i));
        temp_color = color_array{i};

        img(1:num_rows, col_number : col_number + num_columns, 1) =
        uint8(temp_color(1));
        img(1:num_rows, col_number : col_number + num_columns, 2) =
        uint8(temp_color(2));
        img(1:num_rows, col_number : col_number + num_columns, 3) =
        uint8(temp_color(3));

        col_number = col_number + num_columns + 1;

    endfor

endfunction

```