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function [insert_index] = find_dictionary_index(dictionary, insert_item)
%binary search algorithm

num_items = size(dictionary,2);
range_min = 1;
range_max = num_items;
range_mid = ceil((range_min + range_max)/2);

insert_above = false; %if true, then the insert_item should be inserted above the range_min

num_rows = size(insert_item,1);

range = range_max - range_min;

while(range > 1)

    current_item = dictionary{range_mid};

    %if true, the insert item > current item
    if(compare_states(insert_item, current_item) > 0)

        range_min = range_mid;
        range_mid = ceil((range_min + range_max) / 2);

    %otherwise, the insert item <= current item
    else

        range_max = range_mid;
        range_mid = ceil((range_min + range_max) / 2);

    endif

    range = range_max - range_min;

endwhile

current_item = dictionary{range_mid};

%if true, the insert item > current item
if(compare_states(insert_item, current_item) > 0)

    insert_index = range_mid + 1;

else

    insert_index = range_mid;

endif

endfunction

```