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%copyright Charles Davi 2022
function [nearest_neighbors, match_count] =
Genetic_Nearest_Neighbor_TT(training_dataset, testing_dataset, N)

    num_testing_rows = size(testing_dataset,1);

    for i = 1 : num_testing_rows

        current_vector = testing_dataset(i,:);
        x = find(current_vector == 0); %finds missing bases

        %if true, then there are no missing bases
        if isempty(x)

            x = N;

        else

            x = min(N,x(1));

        endif

        %truncates the vector at the first zero
        current_vector = current_vector(1:x);

        %truncates the dataset as well
        temp_dataset = training_dataset(:,1:x);

        %finds the matching bases
        match_matrix = temp_dataset == current_vector;

        %counts the matches
        match_vector = sum(match_matrix,2);

        %finds the best match
        [a b] = max(match_vector);

        %returns the best match and the match count
        nearest_neighbors(i) = b;
        match_count(i) = a;

    endfor

endfunction

```