

```

1 function [cell right_size] = NM_multi_prediction(data_matrix,N)
2
3 M = log2(size(data_matrix,1));
4
5 cell = {};
6
7 num_items = size(data_matrix,1);
8 max_num_unique_matches = 0;
9
10 %this generates permuted instances of the dataset
11 for i = 1 : M
12
13     selected_rows = randperm(num_items,num_items);
14     index_matrix(:,i) = selected_rows';
15     cell{i} = data_matrix(selected_rows,:);
16
17 endfor
18
19 prior_uniques = 0;
20 current_uniques = 0;
21
22 i = 1; %the number of items in each cell
23
24 %iterates until the number of unique matches decreases
25 while((current_uniques >= prior_uniques) && (i <= num_items))
26
27     prior_uniques = current_uniques;
28     counter = 1;
29
30     for k = 1 : M %assembles the prediction matrix
31
32         current_dataset = cell{k};
33         current_dataset = data_matrix(1:i,:); %limits the cell to the first i entries
34
35         %finds the nearest neighbor for each vector in the dataset
36         for j = 1 : num_items
37
38             input_vector = data_matrix(j,:);
39             temp_dataset = current_dataset;
40
41             %we search for the input vector in the dataset
42             x = find(sum(input_vector - temp_dataset,2) == 0);
43
44             %if present, we remove it
45             if(size(x,1) > 0)
46
47                 temp_dataset(x,:) = [];
48
49             endif
50
51             if(size(temp_dataset,1) > 0)
52
53                 [predicted_vector predicted_class prediction_row] = find_NN(input_vector,
54                                     temp_dataset,N);
55                 prediction_matrix(counter,:) = predicted_vector;
56                 counter = counter + 1;
57
58             endif
59
60         endfor
61
62     endfor
63
64     u = unique(prediction_matrix, 'rows'); %returns the unique rows
65
66     current_uniques = size(u,1); %counts the number of unique matches
67     unique_vector(i) = current_uniques; %stores the number of unique matches
68
69     i = i + 1 %increments the number of items per cell
70

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70     endwhile
71
72     right_size = i;
73
74     endfunction
75
```