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%VECTORIZED SORTING ALGORITHM
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%GENERATES DATASET
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num_items = 25;
dataset = randi(25,[num_items 1])

dataset = unique(dataset); %ensures only unique entries
num_items = size(dataset,1);

%scrambles the dataset-----
scramble = randperm(num_items);
dataset = dataset(scramble)

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%SORTS DATASET
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[IGNORE min_index] = min(dataset);

num_rows = size(dataset,1);
temp_matrix = repmat(dataset', [1 1 num_rows]);
ref_dataset = shiftdim(temp_matrix,2);
diff_matrix = dataset.-ref_dataset;
zero_indeces = 1:num_rows+1:num_rows*num_rows;
diff_matrix(zero_indeces) = Inf; %sets the zero entries to infinity

positive_entries = find(diff_matrix > 0); %these cannot be the nearest neighbors
diff_matrix(positive_entries) = Inf;
diff_matrix = abs(diff_matrix);

[a b] = min(diff_matrix)

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nearest_neighbors = reshape(b,[num_rows 1])
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%GENERATES DI-GRAPH EDGES
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edge_matrix = [dataset dataset(nearest_neighbors)];
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edge_matrix(min_index,2) = Inf
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