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Exercise 2.1 script of the K-Means classifier

```
clear
```

Generate DB

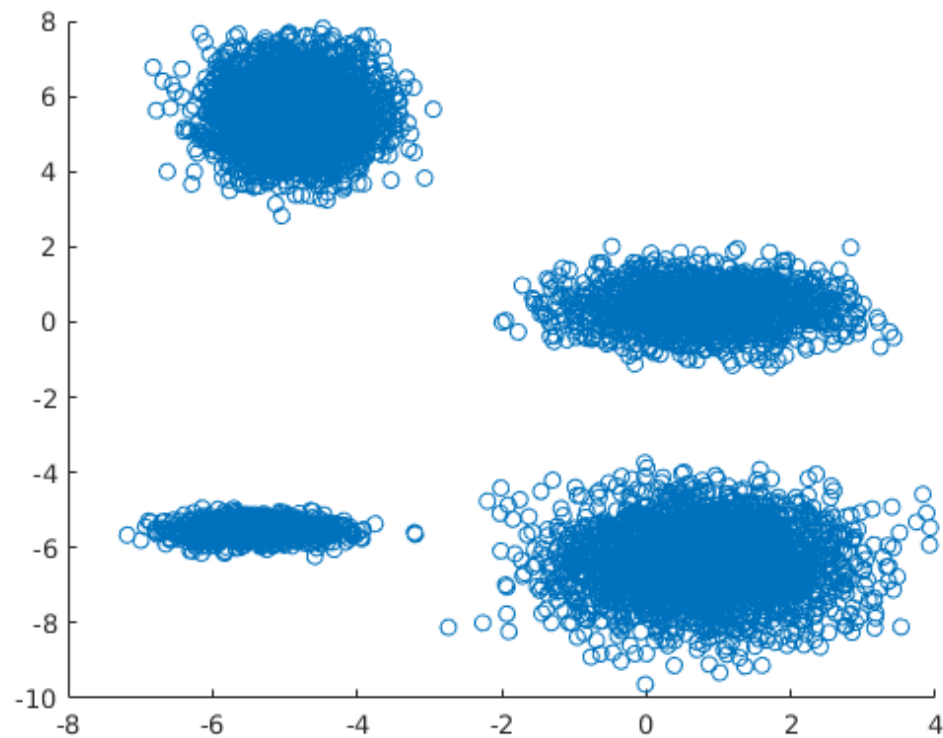
Initialize parameters

```
L = 4;
N = 10000;
d = 2;

% Compute a priori probabilities for each cluster
probabilities = rand(L,1);
probabilities = probabilities./sum(probabilities);

% Generate DB samples
[DB, Nnew] = CLP_Generate(L,N,d,probabilities);

% Draw clusters
scatter(DB(1,:), DB(2,:))%, hold on
```



Classify with K-Means clustering

```
J = zeros(9,1);
tracel = zeros(9,1);
trace2 = zeros(9,1);

for K=2:10
    [Centroides, Labels, n , J(K-1), tracel(K-1), trace2(K-1), ...
     Sw(:,:,K-1), Sb(:,:,K-1)] = CLP_Kmeans(DB(1:d, :),K, d);

    % % Plot evolution of the centroids
    % for i=1:K
    %     c = rand(1,3);
    %     scatter(Centroides(1,i,:), Centroides(2,i,:), 'x', ...
    %             'MarkerEdgeColor', c/sum(c))
    %     line(reshape(Centroides(1,i,:),[1,n]), ...
    %          reshape(Centroides(2,i,:),[1,n]), 'Color', c/sum(c))
    % end
    % hold off

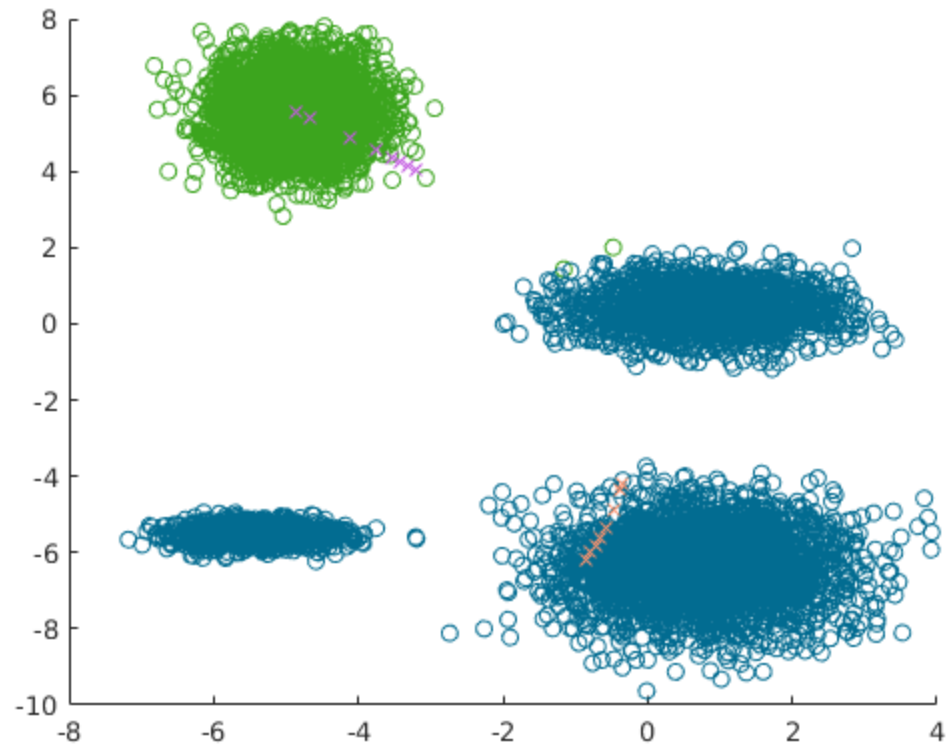
    % Plot DB with color labeling
    figure, hold on
    for i=1:K
        c = rand(1,3);
        scatter(DB(1,Labels==i), DB(2,Labels==i), ...
                'MarkerEdgeColor', c/sum(c))
```

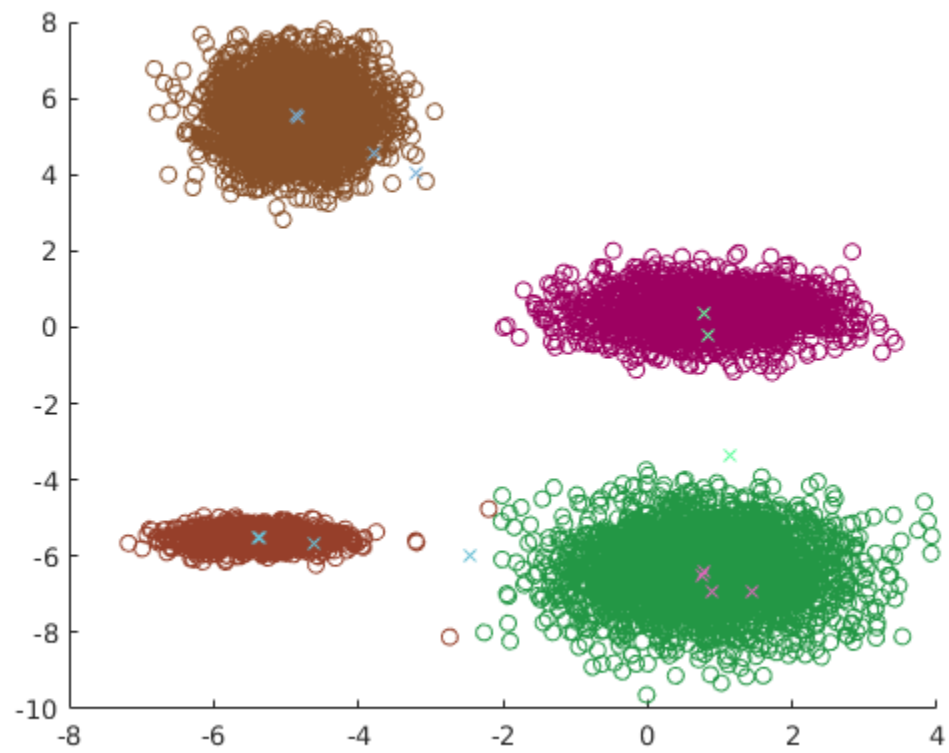
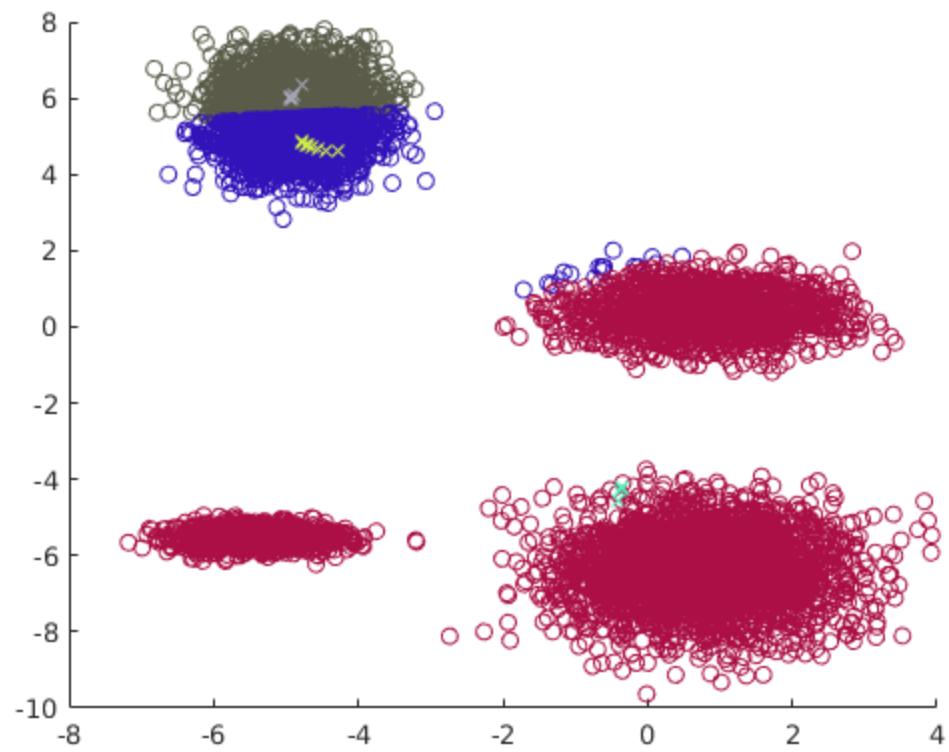
```

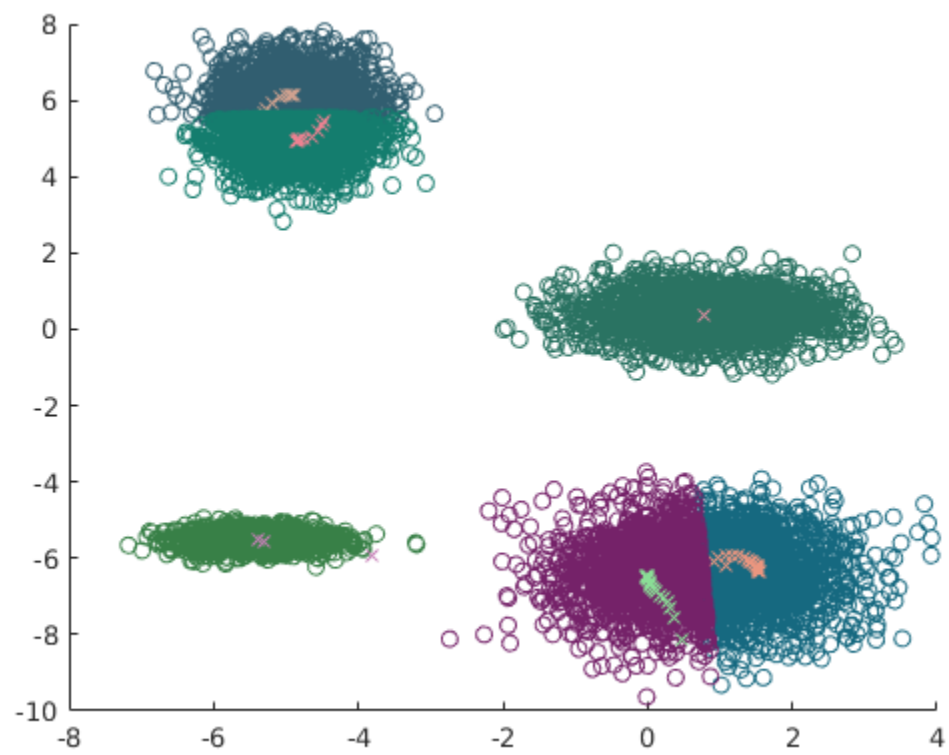
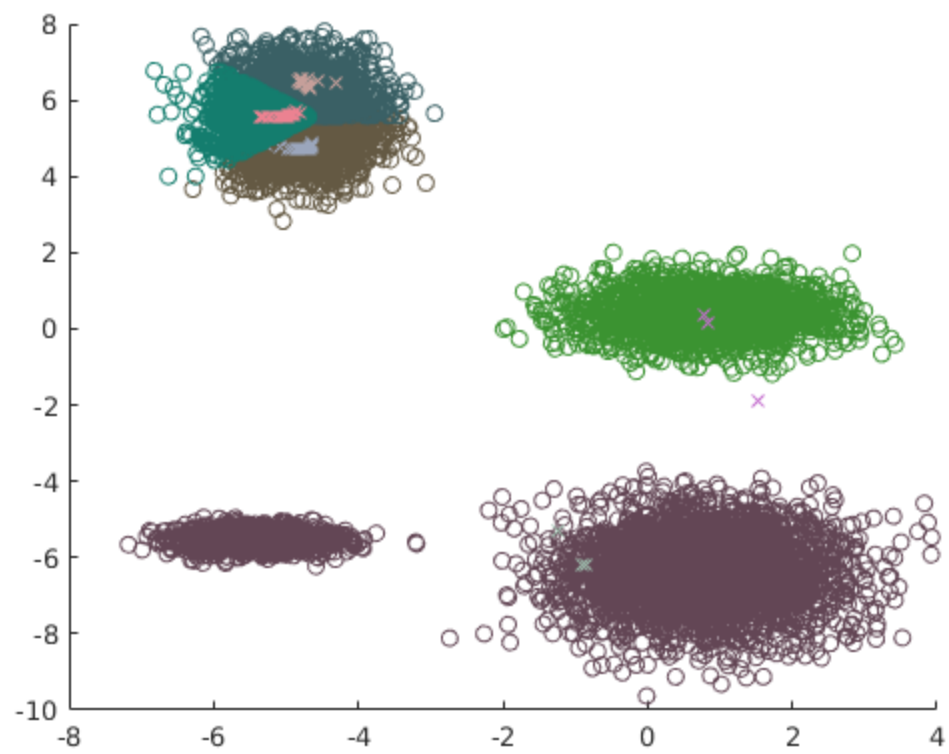
        scatter(Centroides(1,i,:), Centroides(2,i,:), ...
                'x', 'MarkerEdgeColor', 1 - c/sum(c))
    end
end

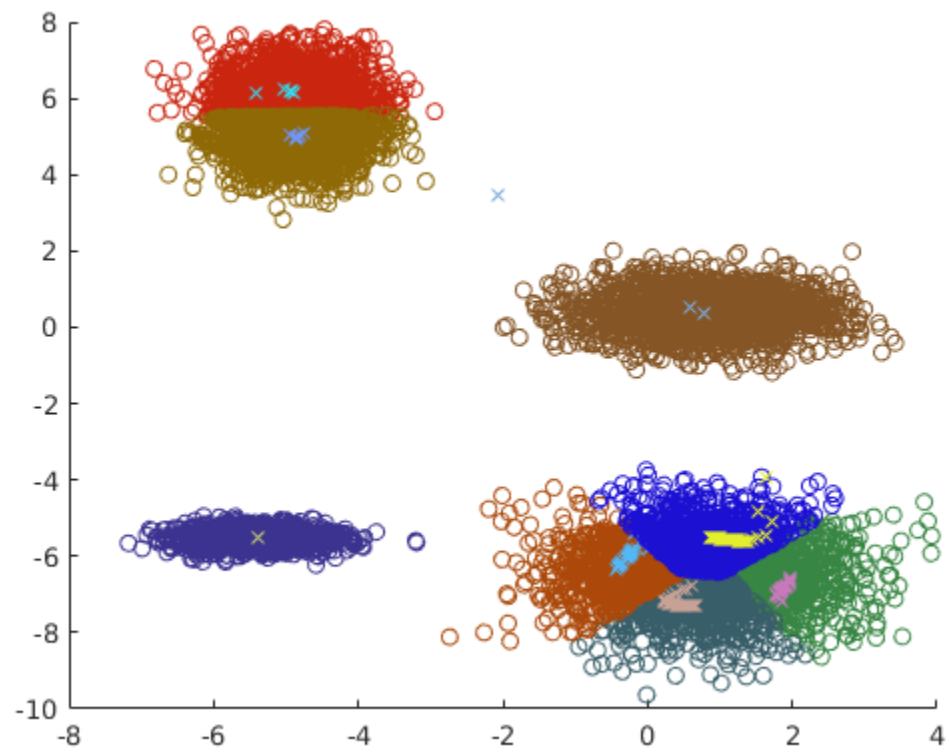
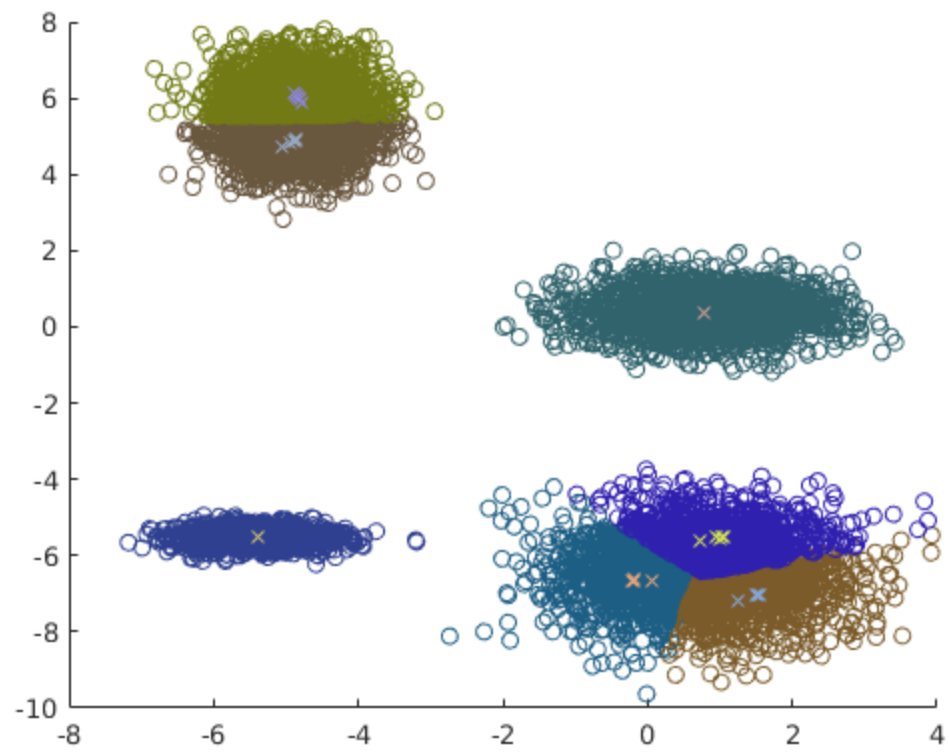
figure
semilogy(2:10, J), grid on

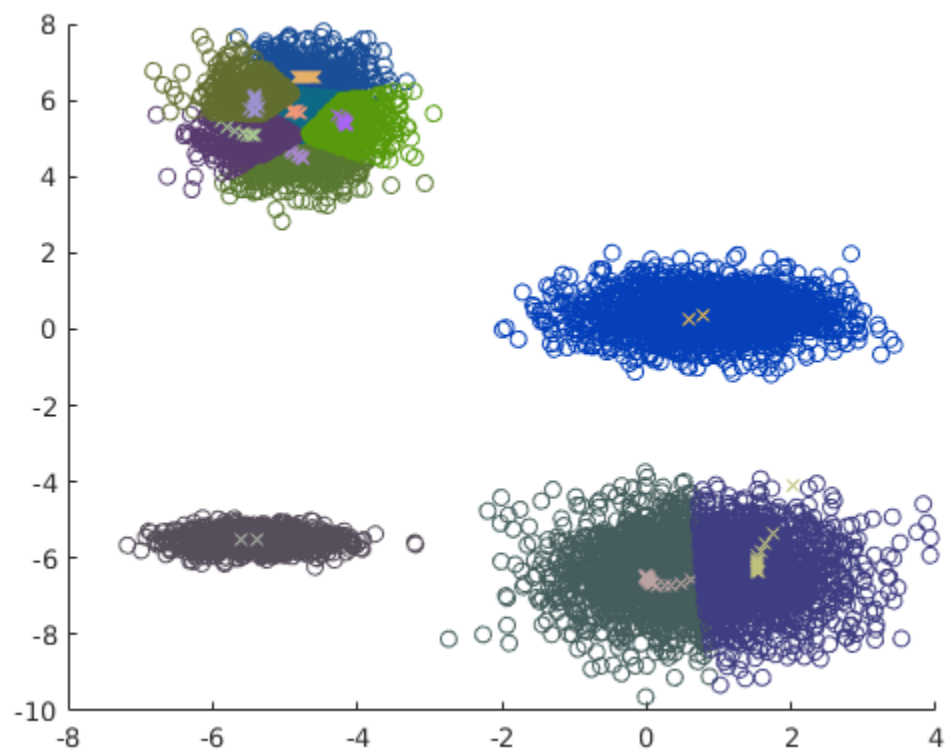
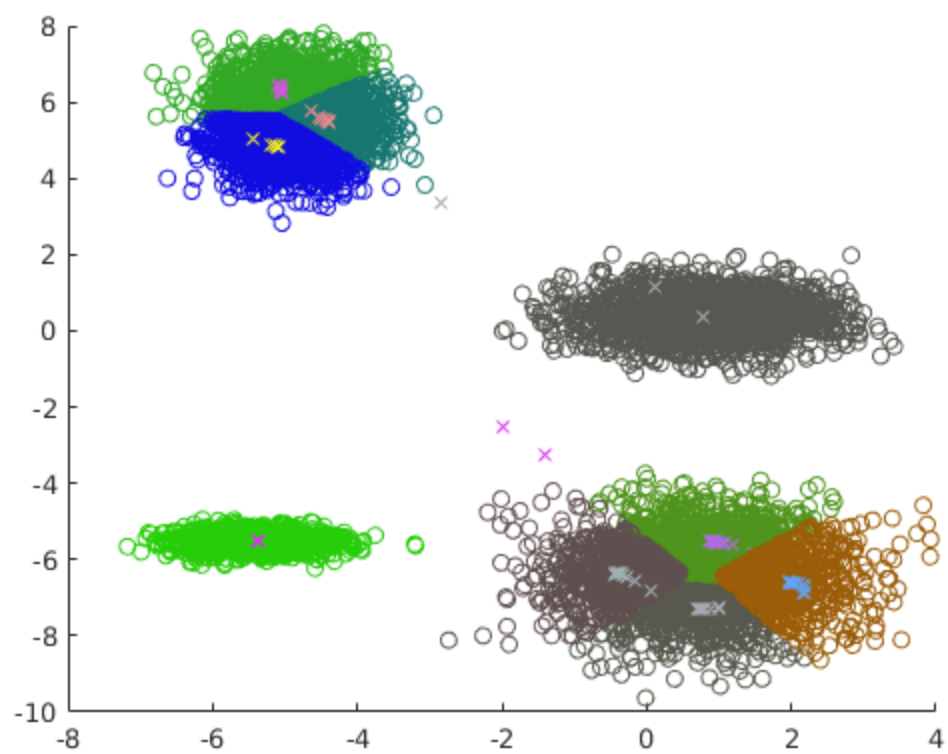
```

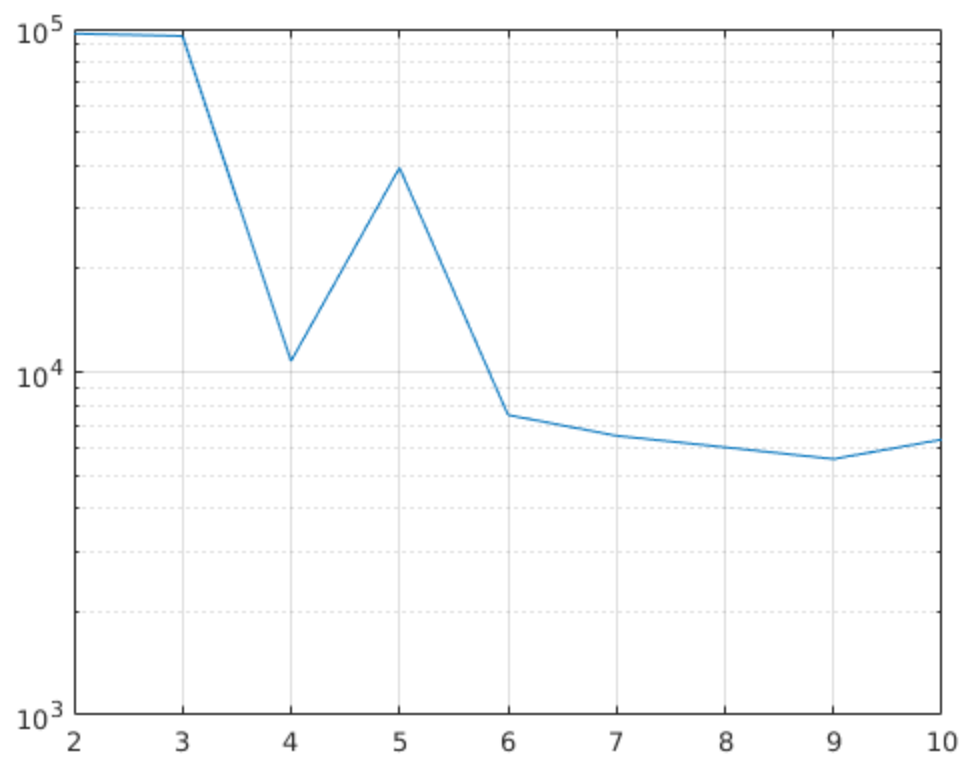












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