1. Select all the topics that have a cluster in the model created above.

**Baseball**

**Basketball**

**Soccer/football**

**Music**

**Politics**

**Law**

Finance

2. Try fitting EM with the random initial parameters you created above. What is the final loglikelihood that the algorithm converges to? Choose the range that contains this value.

Less than 2.2e9

Between 2.2e9 and 2.3e9

**Between 2.3e9 and 2.4e9**

Between 2.4e9 and 2.5e9

Greater than 2.5e9

3. Is the final loglikelihood larger or smaller than the final loglikelihood we obtained above when initializing EM with the results from running k-means?

**Initializing EM with k-means led to a larger final loglikelihood**

Initializing EM with k-means led to a smaller final loglikelihood

4. For the above model, `out\_random\_init`, use the `visualize\_EM\_clusters` method you created above. Are the clusters more or less interpretable than the ones found after initializing using k-means?

More interpretable

**Less interpretable**