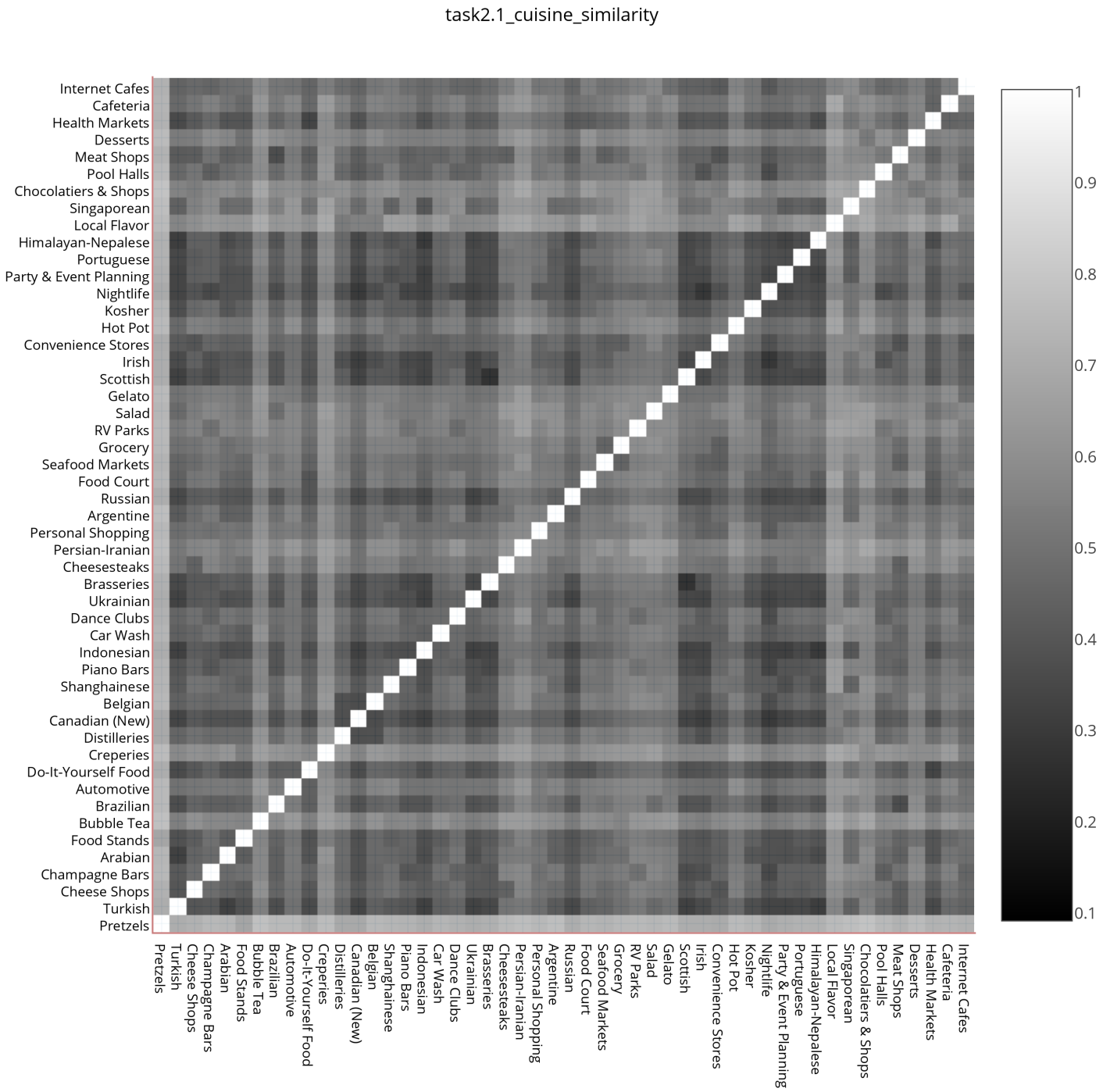
Task 2.1: Visualisation of the Cuisine Map

For this task, I randomly picked 50 categories from the given category dataset

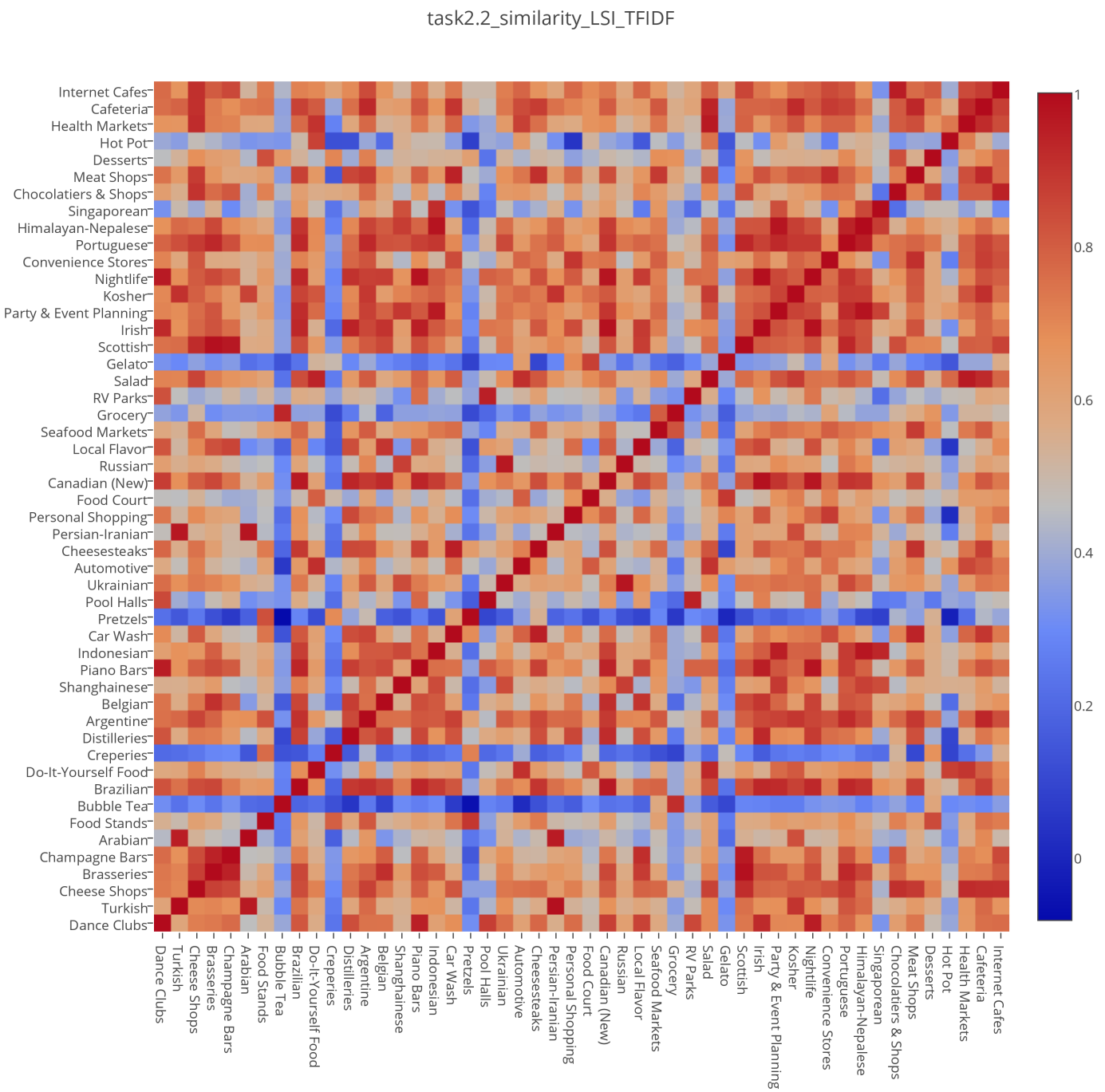
1. **Preprocess each representation as below:**
    1. **Tokenizing representation with nltk.tokenize**
    2. **Removing stop words with nltk.corpus.stopwords**
    3. **Removing punctuation such as “, !@#$~”, etc**
    4. **Removing low frequency (count == 1) words**
    5. **Stemming using nltk.stem.LancasterStemmer**
2. **Calculate the word count of each category representation from step 1**
3. **Calculate the cosine distance between each two of them without tfidf.**

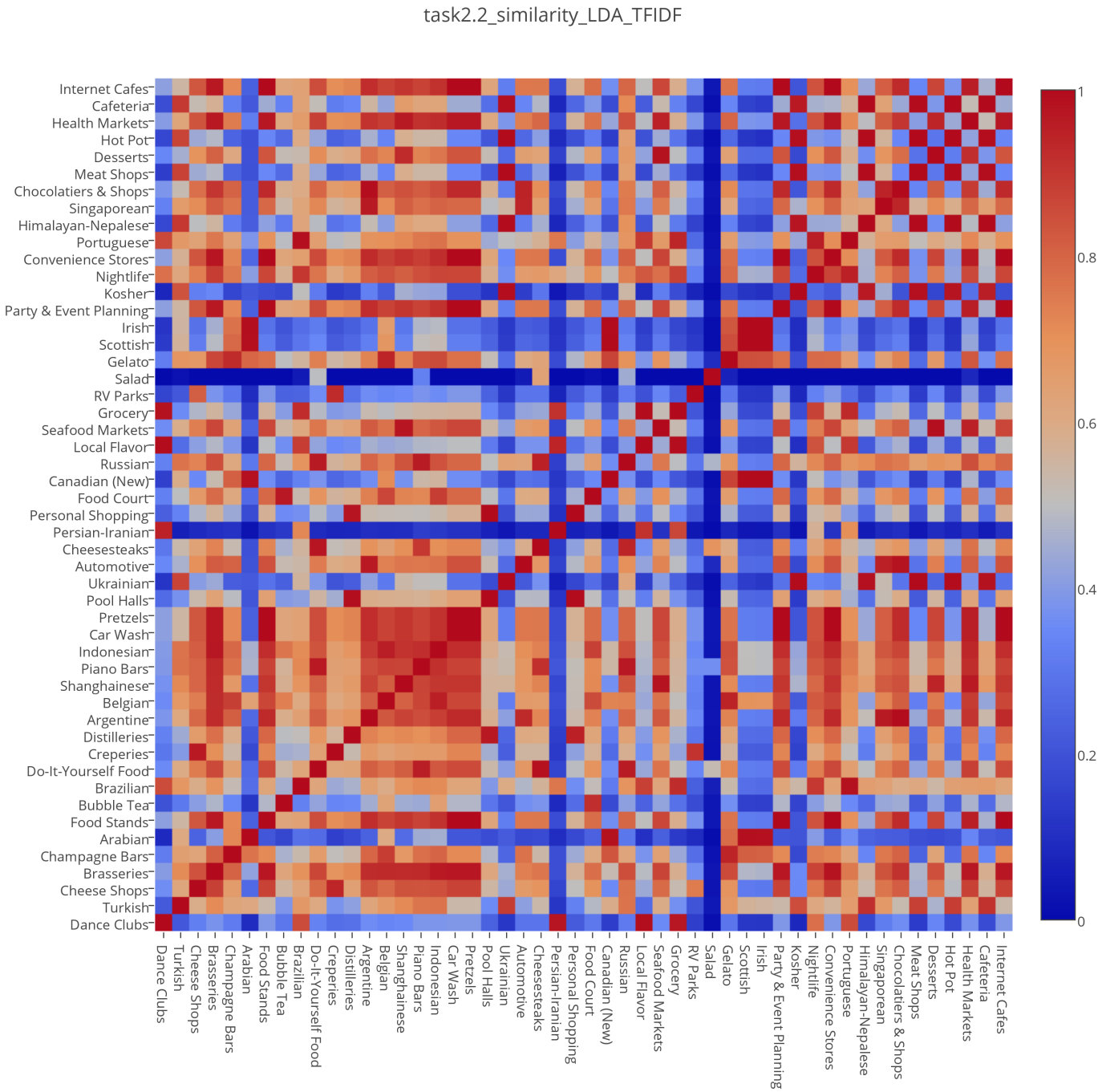


Task 2.2: Improving the Cuisine Map

For the second task, I used gensim and nltk with below steps:

1. **Get all reviews related to specific category as text representation of that category**
2. **The same preprocess step as task 2.1.1**
3. **Train the preprocessed reviews of step2 with LDA and LSI model respectively.**
    1. **Firstly, reviews of a specific category is processed by TFIDF**
    2. **By training with LDA/LSI model with 10 topics to get the dictionary, MatrixSimilarity index and model instance**
    3. **Calculate the similarity between each two of the cuisines based on the result in previous step.**



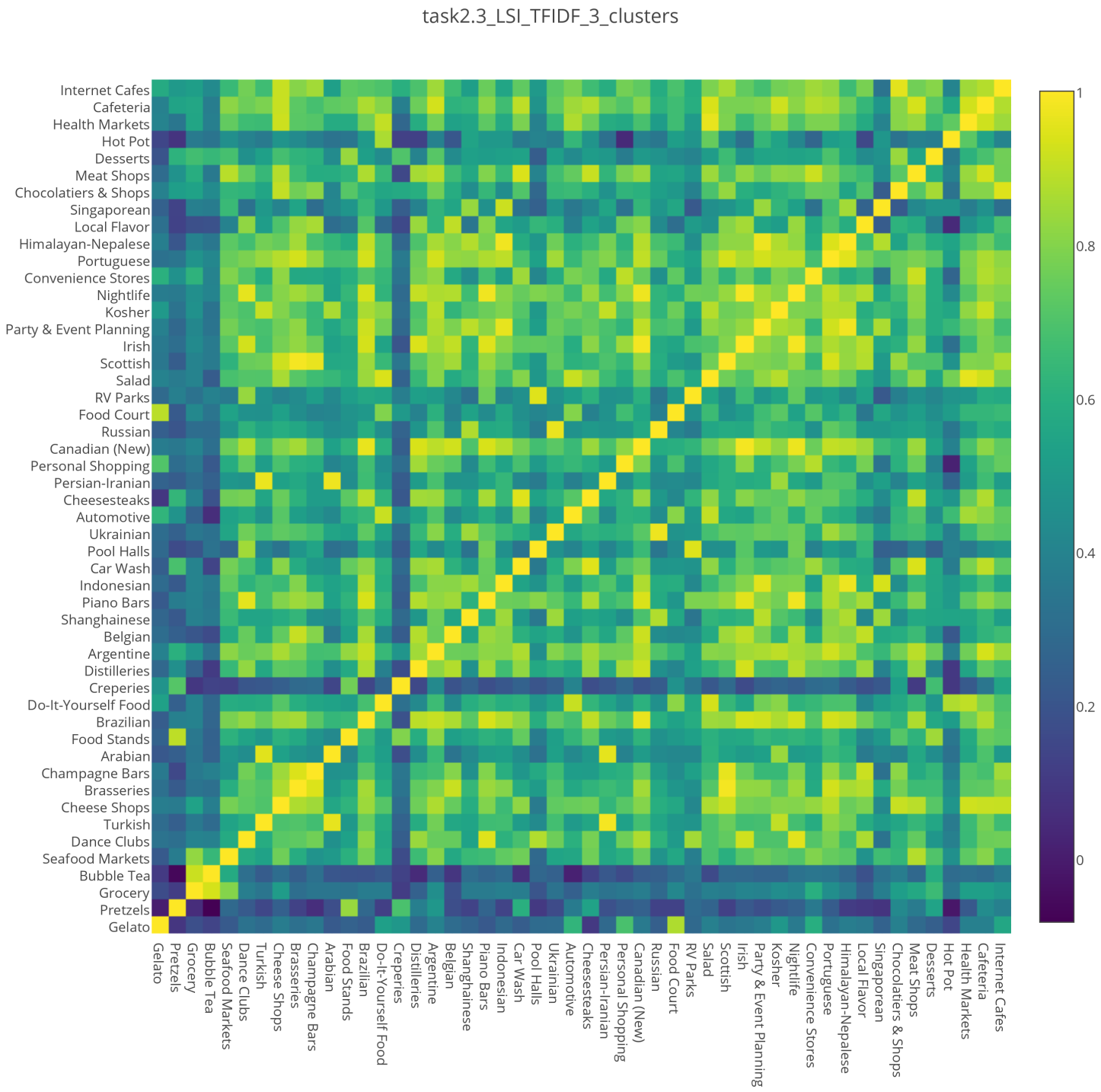


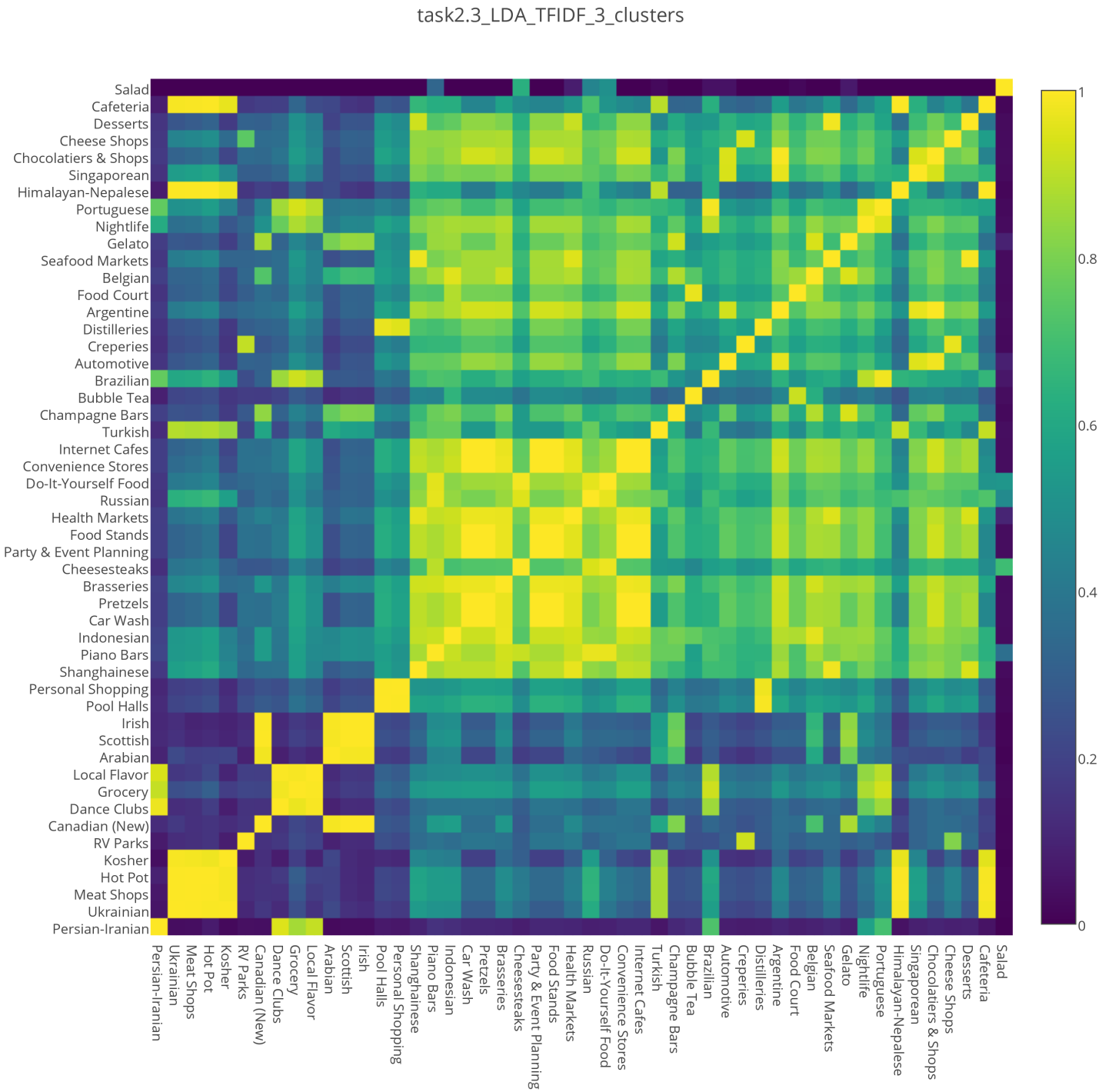
From the graphs shown above we can see two trends:

1. **LSI model similarity is close to cosine distance similarity in task1, whereas the LDA model shows a somewhat different similarity.**
2. **LDA model results in a more clustered style where a bunch of cuisines can be seen similar, LSI model is not so obvious.**

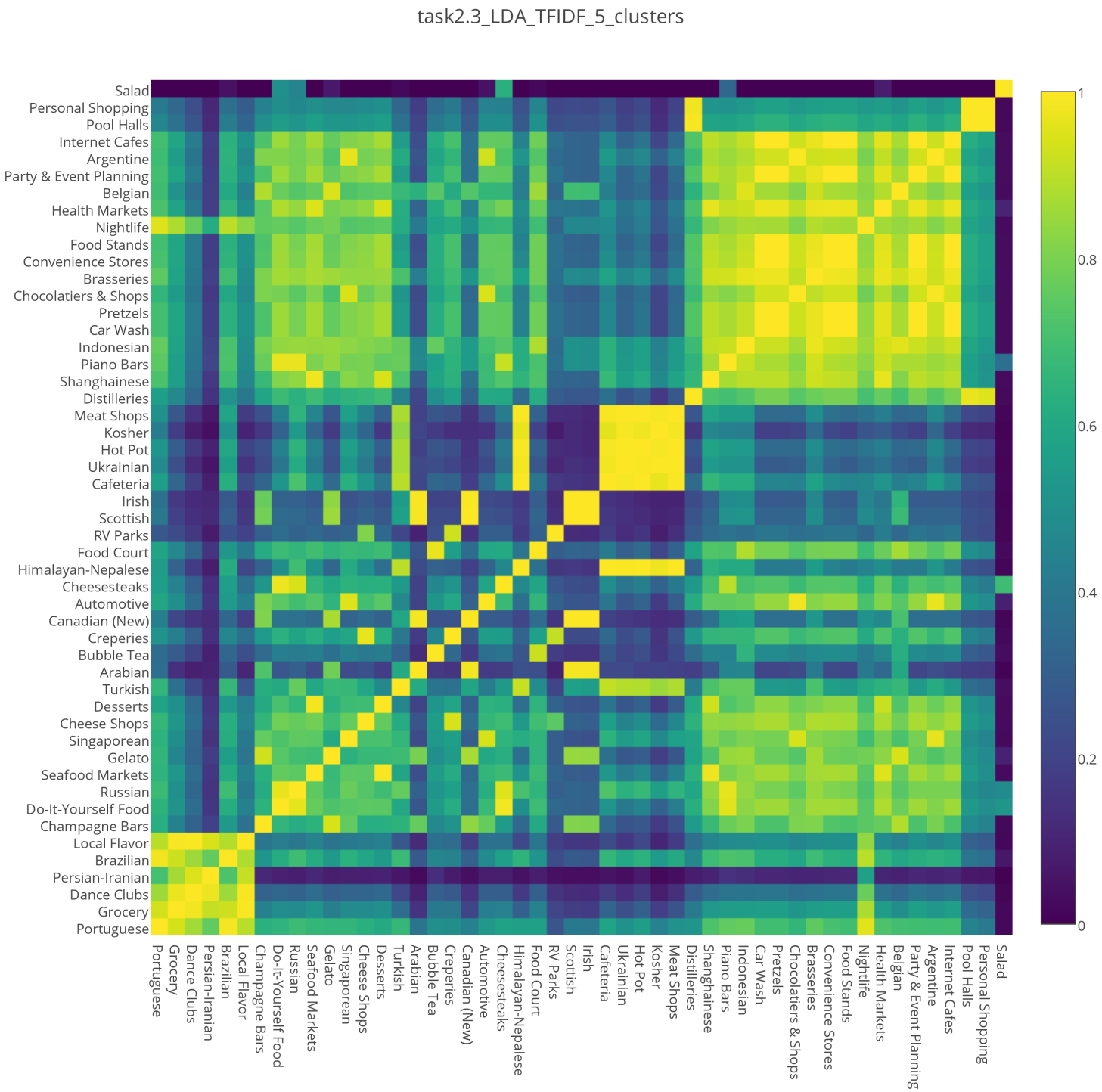
Task 2.3: Incorporating Clustering in Cuisine Map

I applied the same processing step as task2.2 for text representation of categories. Since the similarity of each two categories are available, I grouped them according to mutual similarity by moving similar categories closer to each other.





Then I tried to visualise cluster difference based on LDA model with different cluster numbers.



From the above results we can see that with the same text representation, LDA provides a better result than LSI in terms of similarity cluster, the cluster is more identifiable using LDA model.