**Model User Preferences for Location Based Recommendations**

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**Abstract**

In this project we will create an artificial agent that can recommend eating choices to a user. Our agent will run through an existing dataset, representing user’s eating behavior (cuisines, category, etc.) and learn the user’s preference model for food choices. Based on the learned user preferences, current location and time, the agent will recommend an eating choice for the user in terms of food type and the optimal place to eat. Additionally, through user’s feedback, the agent will evolve its preference model and recommendation function. We have used KNN algorithm.

**Outline**

**User Model**

This model, we are trying to create a preference model of the user for the different features of the businesses.

**The weight update function** is used in the weight calculation for the user model. We provide the features of the business and the weight is updated as below:

wi 🡨 wi + fi \* r

where: wi is the weight for the feature in the user model

fi is the feature value from the business

r is the rating of the business by the user.

**KNN Algorithm**

We have used KNN.

**The Data**

We are separating the data into:

Training Data: The training data consists of the user data from a particular location.

Test Data: This data consists of the user data from a new location.

**Training Stage**

In this stage, we will iterate through the data and create the weight vector, which will have corresponding weights for all the features in the business.

Initially, all the weights are initialized to 0.

Pick the first business from the data and iterate through each feature updating its weights using the weight update function.

**Testing Stage**

Here, we will use the test data to apply KNN on the test data and predicted feature weights as inputs.

If the rating for the particular prediction is greater than a threshold value, the prediction was good.

**Error Correction**

We have not implemented an error correction mechanism, but future work can be done to integrate NLP into the project, where the user review can be read to find out the feature or what the user did not like about the particular business and update the appropriate feature vector accordingly.