OPU at Recipe Search
-- Japanese Recipe Pairing by Naïve Bayes Estimation --

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Summary

Task: Japanese Recipe Pairing

Method: naïve Bayes based acquisition

method1: use major names of ingredients

method2: original ingredients' names

Domain: given 100 sample data only

Evaluation: leave one out = 0%

closed data set = 55% and 94%

Task description

Data sets: 100 Main dish   and   Side dish pair

Dish = Recipe : one record on Rakuten data

Query: A main dish

Answer: A side dish appropriate for the query

Dish = {name, list of ingredients, cooking steps..}

Application of naïve Bayes

A main dish: $M(m_1, m_2, \cdots, m_i)$

m_l, n_k : a name of ingredients

A side dish: $N(n_1, n_2, \cdots, n_j)$

Query: M

MAP estimation: find $N : \max\limits_{N} p(N \mid M) = \dfrac{1}{j} \prod\limits_{k,l}^{k \leq j, l \leq i} p(n_k \mid m_l)$

$p(m_l \mid n_k)$: co-occurrence

$$p(n_k \mid m_l) = \dfrac{p(m_l \mid n_k) p(n_k)}{p(m_l)}$$

prior: $p(n_k) = 1 / j$

Method 1:

Use major names of ingredients

omit detailed description:

マスタード/粒　　⇒　　マスタード

mustard/meal　　⇒　　　mustard

omit too rough class:

肉類/ぶた/こま切れ　⇒　ぶた

meat/pork/small pieces　⇒　pork

Method 2:

Use names of ingredients as it provided:

マスタード/粒

mustard/meal

肉類/ぶた/こま切れ

meat/pork/small pieces

Runs and results

Run1: method1 leave-one-out

   precision: 0.01

Run2: method1 closed(100learning data)

   precision: 0.55

Run3: method2 leave-one-out

   precision: 0.00

Run4: method2 closed

   precision: 0.94

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For the next step

- Using quantity of ingredients

- Using cooking process

- Evaluation by large data

- Data construction method

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