Advanced Topics in Artificial Intelligence

Assignment 1

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1. Definition

Firstly, I define the DISH(Types of Dishes) that are "various" as distribution:

Type of Dish	5	9	10	11	14	15	16	18	20
Degree of membership	0	0	0.2	0.3	0.5	0.6	0.7	0.8	1.0

Secondly, I define the DELIC(Deliciousness Index) that is "high" as distribution:

Deliciousness Index	3	4	5	7	8	9	10
Degree of membership	0	0	0	0.4	0.6	0.8	1.0

Thirdly, I define the HYG(Hygiene Index) that is "fine" as distribution:

Deliciousness Index	3	4	5	6	7	8	10
Degree of membership	0	0	0	0.3	0.5	0.7	1.0

Finally, I define if the party will be held on time, the DELAY should be less than 24 minutes.

2. Fuzzy Query

If Bill want to get the list of CATER that PRICE are no more than $10000, and DELAY time is less than 24 minutes. Also, it is either with various DISH and fine HYG or high DELIC, the following fuzzy query can be generated as:

(cater_rec(CATER)(and (<= PRICE 10000)(< DELAY 24)) (or (and (DISH ((5 9 10 11 14 15 16 18 20)(0 0 0.2 0.3 0.5 0.6 0.7 0.8 1.0)) 1)(HYG ((3 4 5 6 7 8 10)(0 0 0 0.3 0.5 0.7 1.0)) 1))(DELIC ((3 4 5 7 8 9 10)(0 0 0 0.4 0.6 0.8 1.0)) 1)))

Eliminated by NON-FUZZY conditions, the CATERs and corresponding degree of membership in each FUZZY term are listed as follow:

CATER	Degree of DISH	Degree of HYG	Degree of DELIC

Ho Ho Sak	0.6	0	0
Chinese Taste	0.2	0.5	1.0
Pizza Island	0	0.7	0.4
Qin Spicy	0.5	0.7	0.8
Olivia Restaurant	0.3	0	0.4
Asian Barbeque	0	0.5	0

And then calculate by operator "and", and we can get Degrees as follow:

CATER	Degree of (DISH and HYG)	Degree of DELIC
Ho Ho Sak	0	0
Chinese Taste	0.2	1.0
Pizza Island	0	0.4
Qin Spicy	0.5	0.8
Olivia Restaurant	0	0.4
Asian Barbeque	0	0

After that, calculate by operator "or", and we can get Degrees as follow:

CATER	Degree of ((DISH and HYG) or DELIC)
Ho Ho Sak	0
Chinese Taste	1.0
Pizza Island	0.4
Qin Spicy	0.8
Olivia Restaurant	0.4
Asian Barbeque	0

Finally, only 4 CATERs remain:

(Chinese Taste   1.0)

(Pizza Island   0.4)

(Qin Spicy   0.8)

(Olivia Restaurant   0.4)

Therefore, after fuzzy query, Chinese Taste, with highest score, is the best choice for Bill to hold the party.