Fuzzy Control Systems

Project On Fuzzy Logic Controller (Tip Predictor)

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IT3140 Soft Computing

Architecture Diagram:

Graphical user interface

Description automatically generated

Inputs:

* Service:

Graphical user interface

Description automatically generated

Graphical user interface

Description automatically generated with low confidence

Graphical user interface, histogram

Description automatically generated with medium confidence

* Food Quality:

Graphical user interface

Description automatically generated

Graphical user interface, application

Description automatically generated

Output:

* Tip:

A picture containing graphical user interface

Description automatically generated

A picture containing graphical user interface

Description automatically generated

A picture containing graphical user interface

Description automatically generated

Rule Base:

Graphical user interface, text, application, email

Description automatically generated

Test Cases:

Test Cases:

1. If the Service is given a rating of 3 out of 10 and the Food Quality is given a rating of 8 out of 10.

Graphical user interface

Description automatically generated

Tip comes out to be 16.7%.

1. If the Service is given a rating of 2 out of 10 and the Food Quality is given a rating of 1 out of 10.

Graphical user interface, diagram

Description automatically generated

Tip comes out to be 7.95%.

1. If the Service is given a rating of 9 out of 10 and the Food Quality is given a rating of 8 out of 10.

Graphical user interface, diagram, application

Description automatically generated

Tip comes out to be 23.7%.

1. If the Service is given rating of 5 out of 10 and the Food Quality is given a rating of 4 out of 10.

A picture containing graphical user interface

Description automatically generated

Tip comes out to be 15%.

1. If the Service is given a rating of 3 out of 10 and the Food Quality is given a rating of 10 out of 10.

Graphical user interface

Description automatically generated

Tip comes out to be 17.6%.

Code (.fis):

[System]

Name='Tip\_Predictor'

Type='mamdani'

Version=2.0

NumInputs=2

NumOutputs=1

NumRules=5

AndMethod='min'

OrMethod='max'

ImpMethod='min'

AggMethod='max'

DefuzzMethod='centroid'

[Input1]

Name='Service'

Range=[0 10]

NumMFs=3

MF1='Poor':'gaussmf',[1.769 -1.388e-16]

MF2='Good':'gaussmf',[1.769 5]

MF3='Excellent':'gaussmf',[1.769 10]

[Input2]

Name='Food\_Quality'

Range=[0 10]

NumMFs=2

MF1='Bad':'trapmf',[0 0 1 3]

MF2='Delicious':'trapmf',[7 9 10 11]

[Output1]

Name='Tip'

Range=[0 30]

NumMFs=3

MF1='Less':'trimf',[0 5 10]

MF2='Average':'trimf',[10 15 20]

MF3='High':'trimf',[20 25 30]

[Rules]

1 1, 1 (1) : 2

2 0, 2 (1) : 2

3 2, 3 (1) : 2

2 1, 1 (1) : 1

1 2, 2 (1) : 1