Experiment No. :5
Course :Artificial Intelligence and Soft computing Lab
Course Code : CSL703

Name: Hayden Cordeiro
Roll No.:05
Batch :D

Aim : Simulation of Fuzzy Inference Logic

Problem Statement :
Simulation of Fuzzy Inference Logic

Learning Objective : Simulation of Fuzzy Inference Logic.

Learning Outcome : Student are able to successfully Simulate of Fuzzy Inference Logic.

Course Outcome

CSL703.5 To realize the Fuzzy Inference Logic

Program Outcome
(PO 3) Design/ development of solutions: Breadth and uniqueness of engineering problems i.e. the extent to
which problems are original and to which solutions have previously been identified or codified
(PO 12) Life Long Learning

Bloom's Taxonomy Level

- Remembering
- Understanding
-

Theory:

Simulation of Fuzzy Inference Logic
http://vlabs.iitkgp.ac.in/vlt/project.html

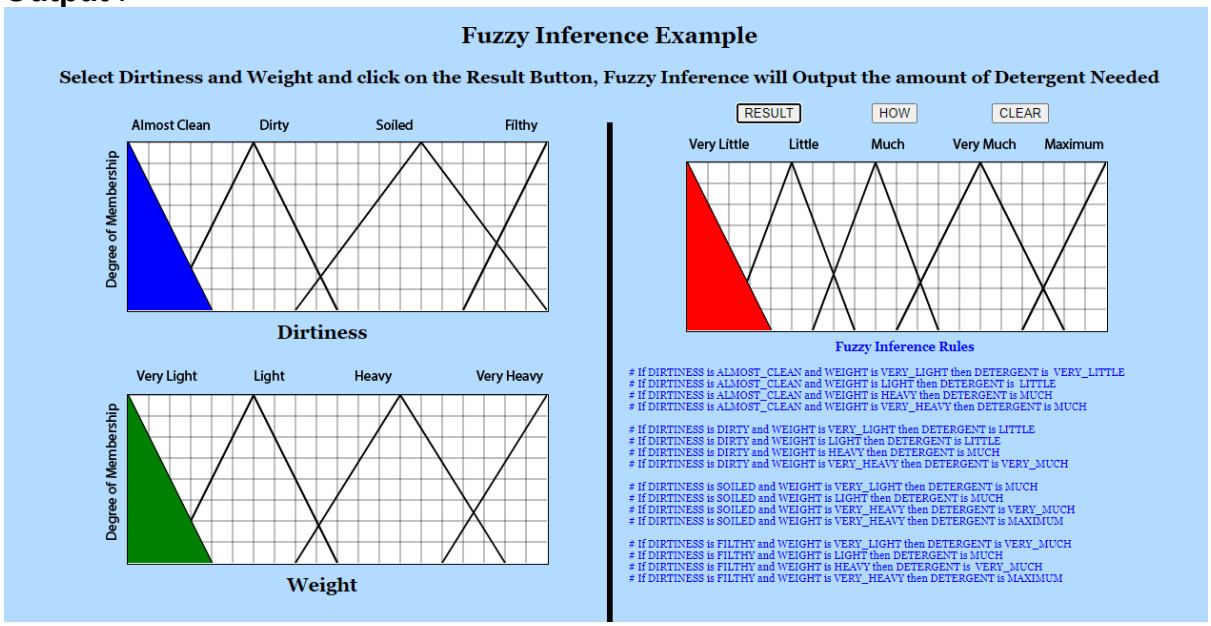
Fuzzy inference is the process of formulating the mapping from a given input to an output using fuzzy logic. The mapping then provides a basis from which decisions can be made, or patterns discerned. The process of fuzzy inference involves Membership Functions, Logical Operations, and If-Then Rules. You can implement two types of fuzzy inference systems in the toolbox: Mamdani-type and Sugeno-type. These two types of inference systems vary somewhat in the way outputs are determined.

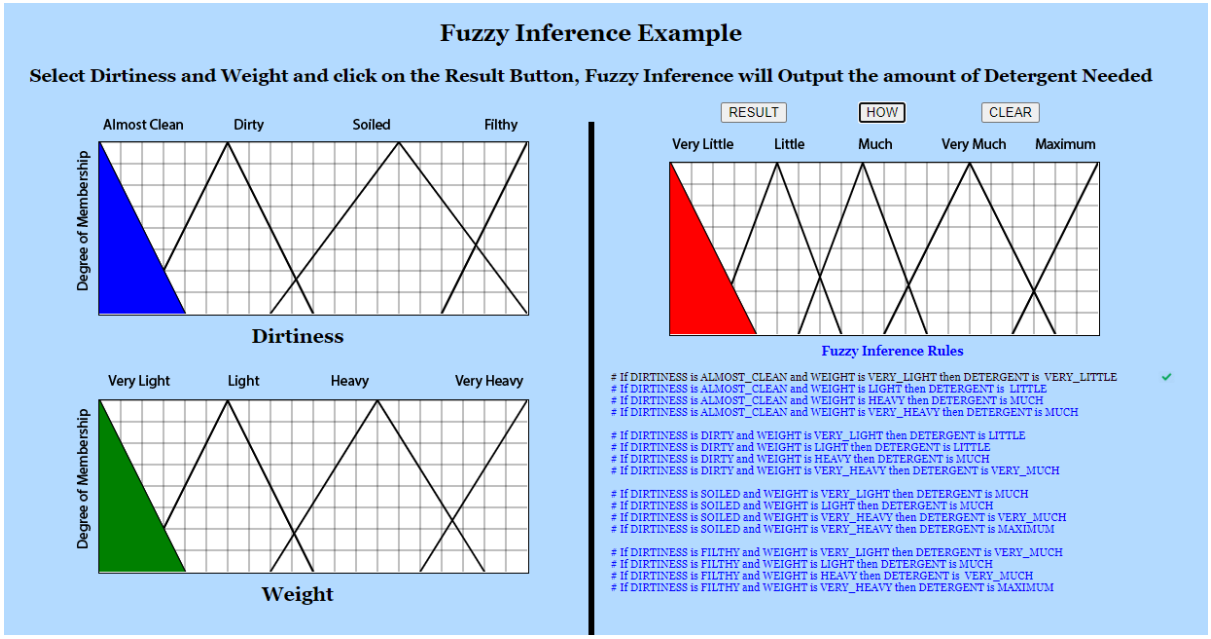
Fuzzy inference systems have been successfully applied in fields such as automatic control, data classification, decision analysis, expert systems, and computer vision. Because of its multidisciplinary nature, fuzzy inference systems are associated with a number of names, such as fuzzy-rule-based systems, fuzzy expert systems, fuzzy modeling, fuzzy associative memory, fuzzy logic controllers, and simply (and ambiguously) fuzzy systems.

Algorithm :
Simulation of Fuzzy Inference Logic

http://vlabs.iitkgp.ac.in/vlt/project.html

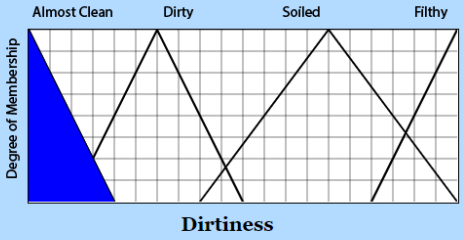
Output :



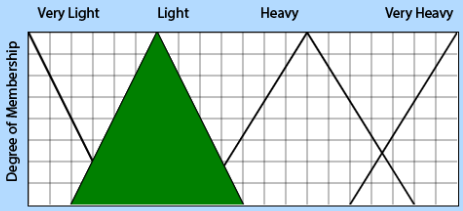


Fuzzy Inference Example

Select Dirtiness and Weight and click on the Result Button, Fuzzy Inference will Output the amount of Detergent Needed



Dirtiness



Weight

RESULT HOW CLEAR

Fuzzy Inference Rules

If DIRTINESS is ALMOST_CLEAN and WEIGHT is VERY_LIGHT then DETERGENT is VERY_LITTLE
If DIRTINESS is ALMOST_CLEAN and WEIGHT is LIGHT then DETERGENT is LITTLE
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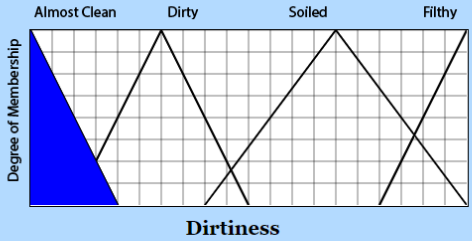

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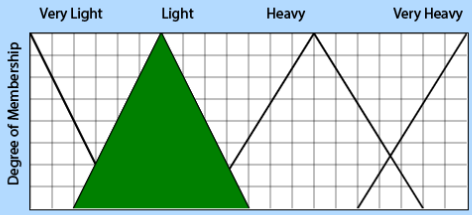

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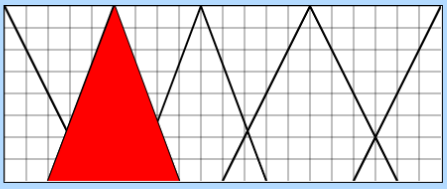

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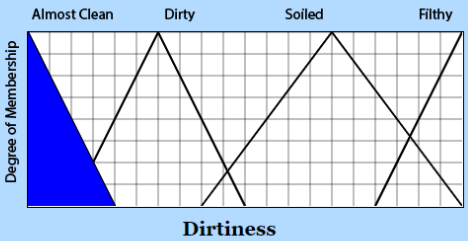

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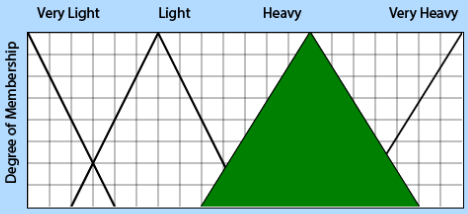

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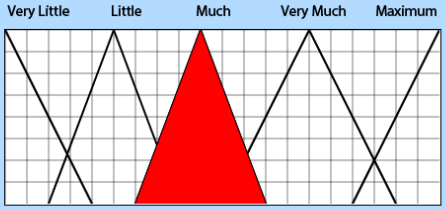

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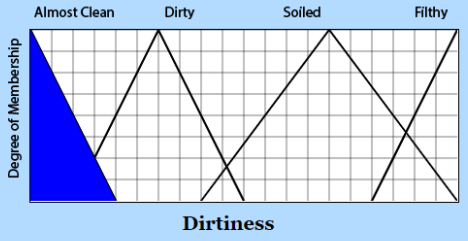

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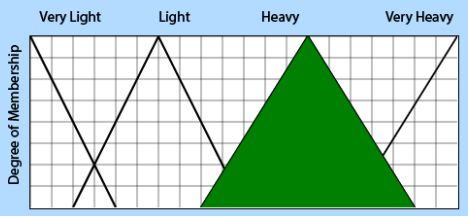

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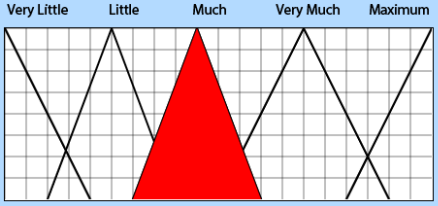

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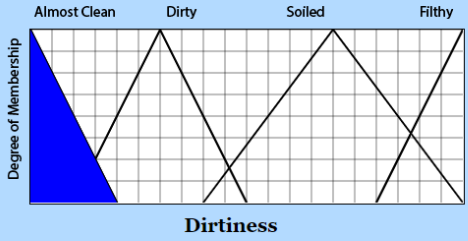

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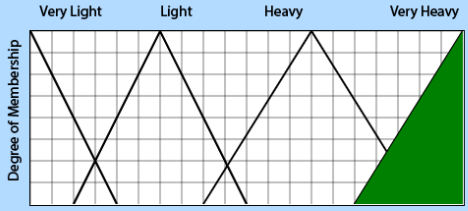

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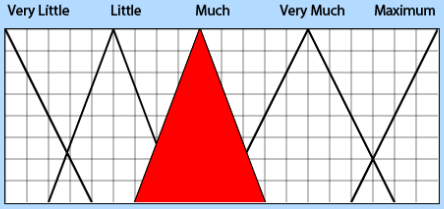

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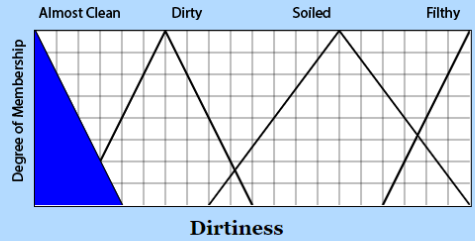
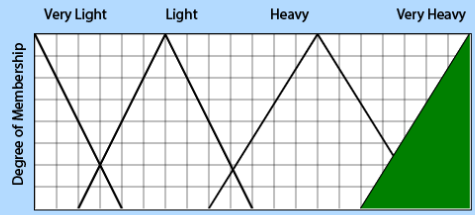
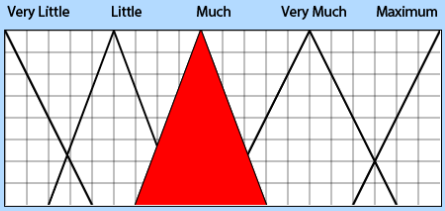


Dirtiness



Weight

RESULT HOW CLEAR



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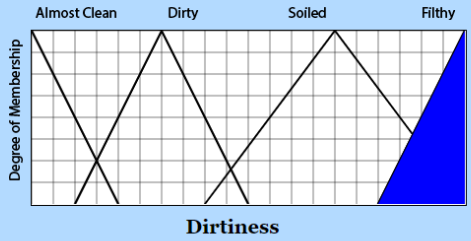

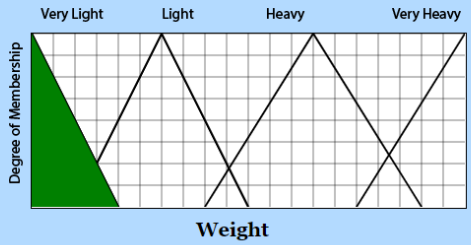

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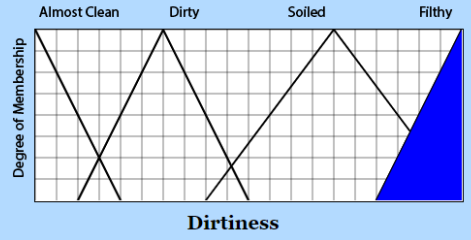

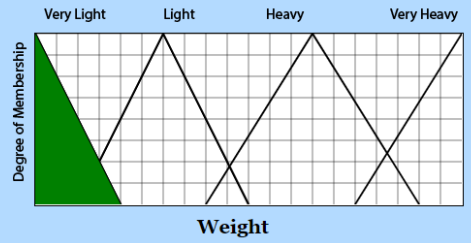

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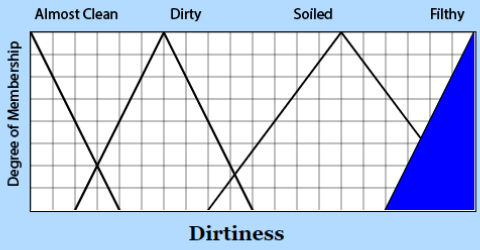
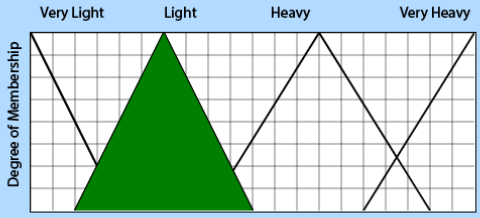


Dirtiness



Weight

RESULT HOW CLEAR

Fuzzy Inference Rules

If DIRTINESS is ALMOST_CLEAN and WEIGHT is VERY_LIGHT then DETERGENT is VERY_LITTLE
If DIRTINESS is ALMOST_CLEAN and WEIGHT is LIGHT then DETERGENT is LITTLE
If DIRTINESS is ALMOST_CLEAN and WEIGHT is HEAVY then DETERGENT is MUCH
If DIRTINESS is ALMOST_CLEAN and WEIGHT is VERY_HEAVY then DETERGENT is MUCH

If DIRTINESS is DIRTY and WEIGHT is VERY_LIGHT then DETERGENT is LITTLE
If DIRTINESS is DIRTY and WEIGHT is LIGHT then DETERGENT is LITTLE
If DIRTINESS is DIRTY and WEIGHT is HEAVY then DETERGENT is MUCH
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If DIRTINESS is SOILED and WEIGHT is VERY_LIGHT then DETERGENT is MUCH
If DIRTINESS is SOILED and WEIGHT is LIGHT then DETERGENT is MUCH
If DIRTINESS is SOILED and WEIGHT is VERY_HEAVY then DETERGENT is VERY_MUCH
If DIRTINESS is SOILED and WEIGHT is VERY_HEAVY then DETERGENT is MAXIMUM

If DIRTINESS is FILTHY and WEIGHT is VERY_LIGHT then DETERGENT is VERY_MUCH
If DIRTINESS is FILTHY and WEIGHT is LIGHT then DETERGENT is MUCH
If DIRTINESS is FILTHY and WEIGHT is HEAVY then DETERGENT is VERY_MUCH
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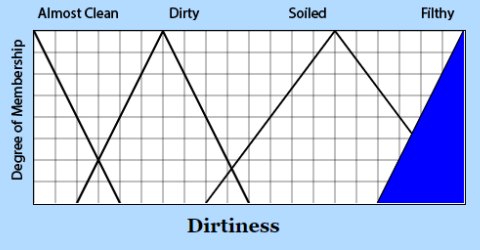
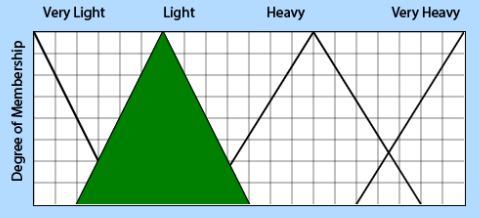
Fuzzy Inference Example

Select Dirtiness and Weight and click on the Result Button, Fuzzy Inference will Output the amount of Detergent Needed

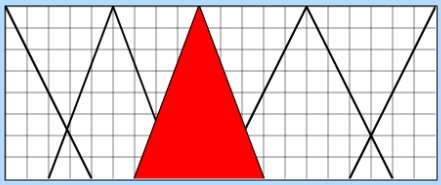


Dirtiness



Weight

RESULT HOW CLEAR



Fuzzy Inference Rules

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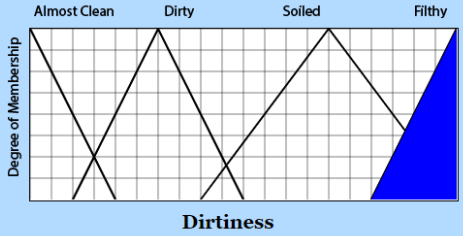
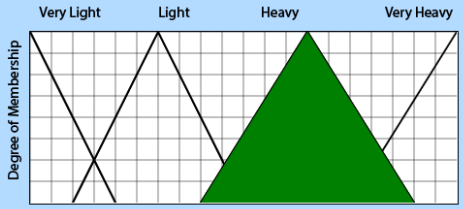


Dirtiness



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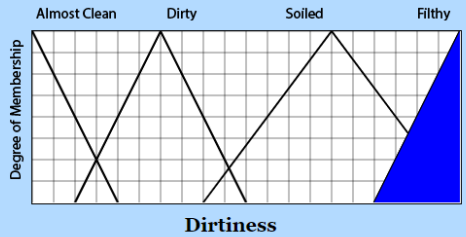
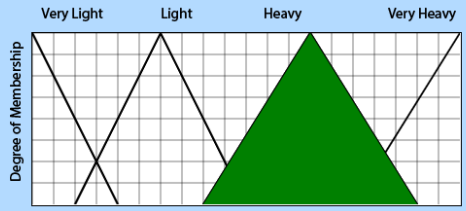
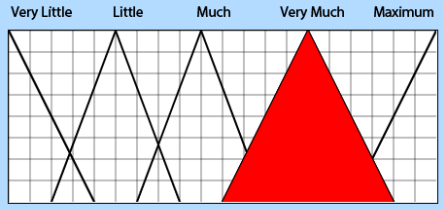


Dirtiness



Weight

RESULT HOW CLEAR



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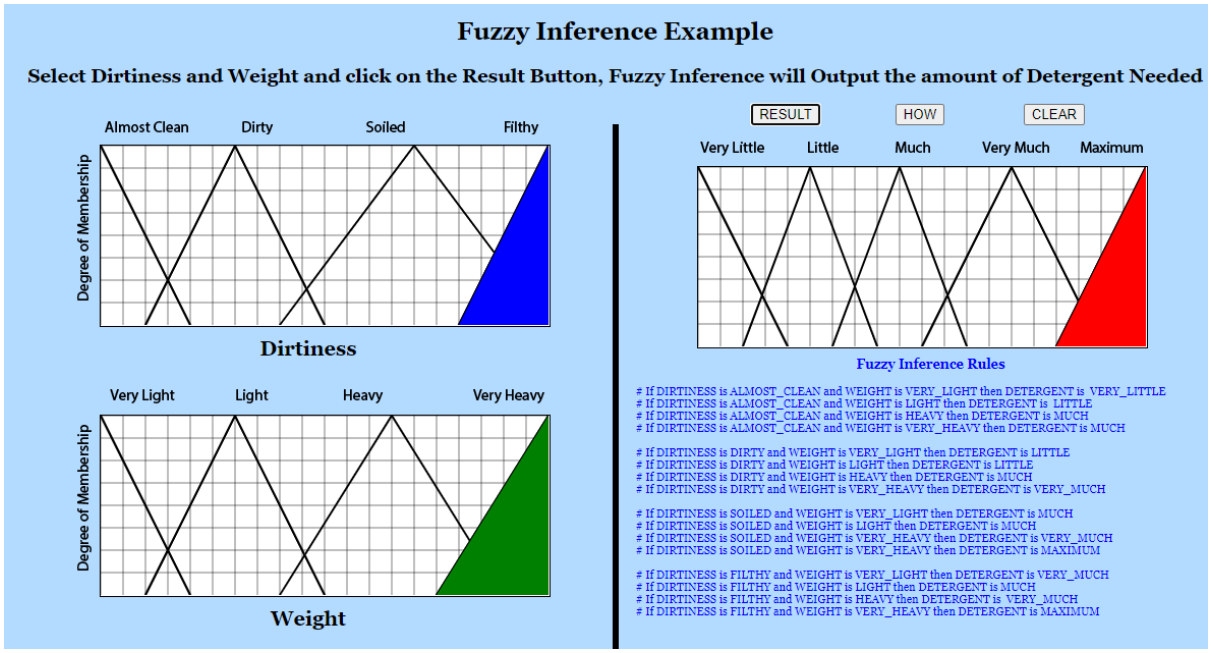

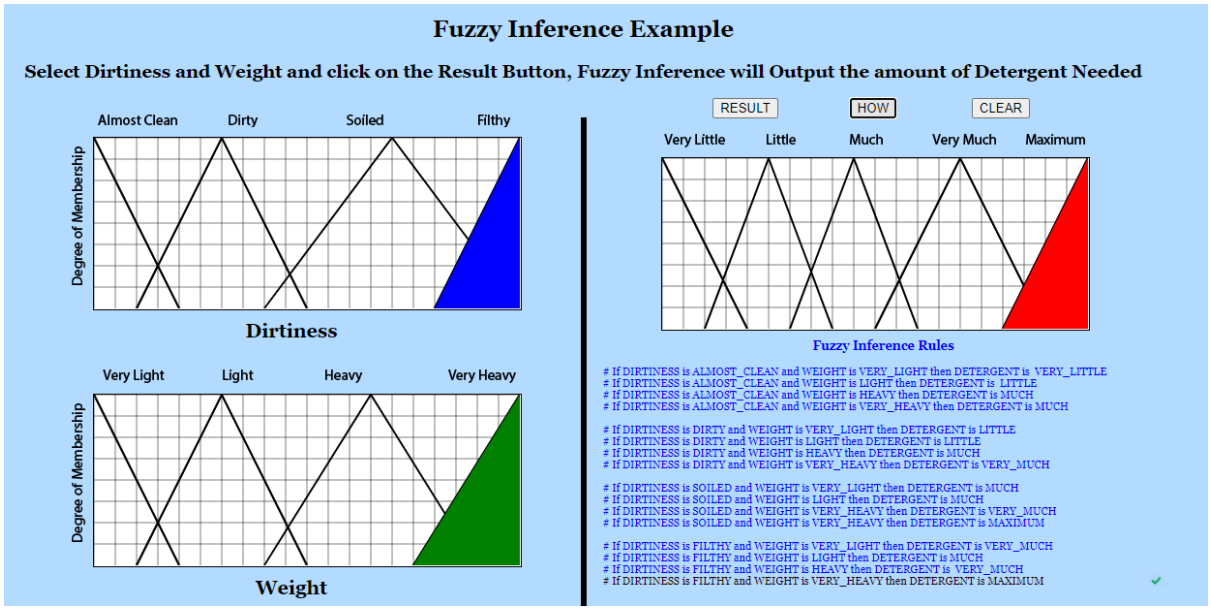

Conclusion :
Simulation of Fuzzy Inference Logic *is successfully demonstrated*