# Computational Intelligence Lab

# Assignment – 5

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IT - B5 – 36

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## Washing machine controller using Fuzzy logic.

We are given the linguistic variables ClothType, DirtType, Detergenttype, ClothMass, WaterLevel, WaterTEMP and DIRTNESS as input variables which can be written as:

ClothType(silk, cotton, woollen, jeans)

DirtType(Greesy, NonGreesy, Mix)

DetergentType(Solid, Liquid)

ClothMass(1-4lbs, 2-8lbs, 6-10lbs)

WaterLevel(Low, Medium, High)

WaterTEMP(Cold, Warm, Hot)

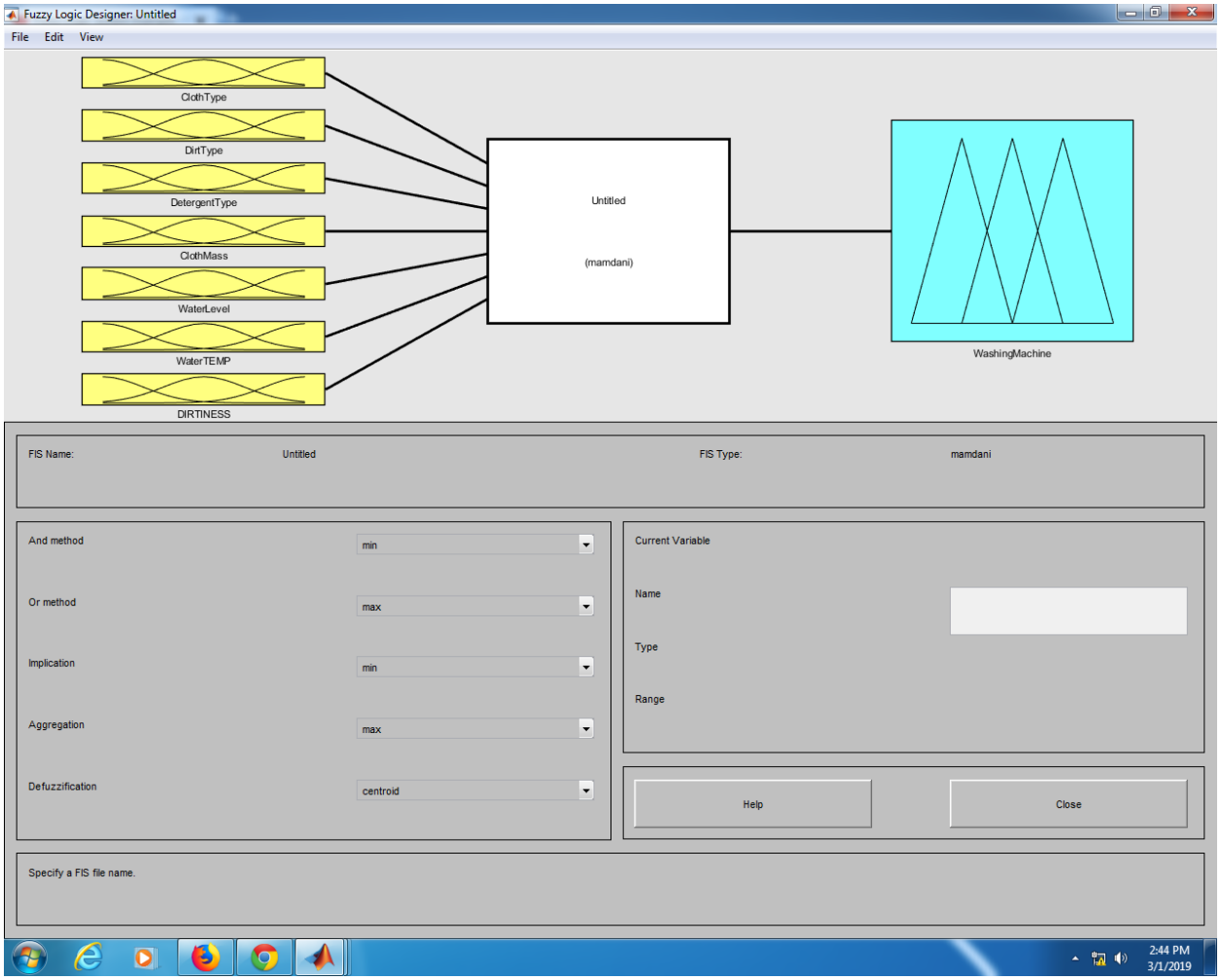
DIRTNESS(Low, Medium, High)

The output of system is washing machine which is represented as –

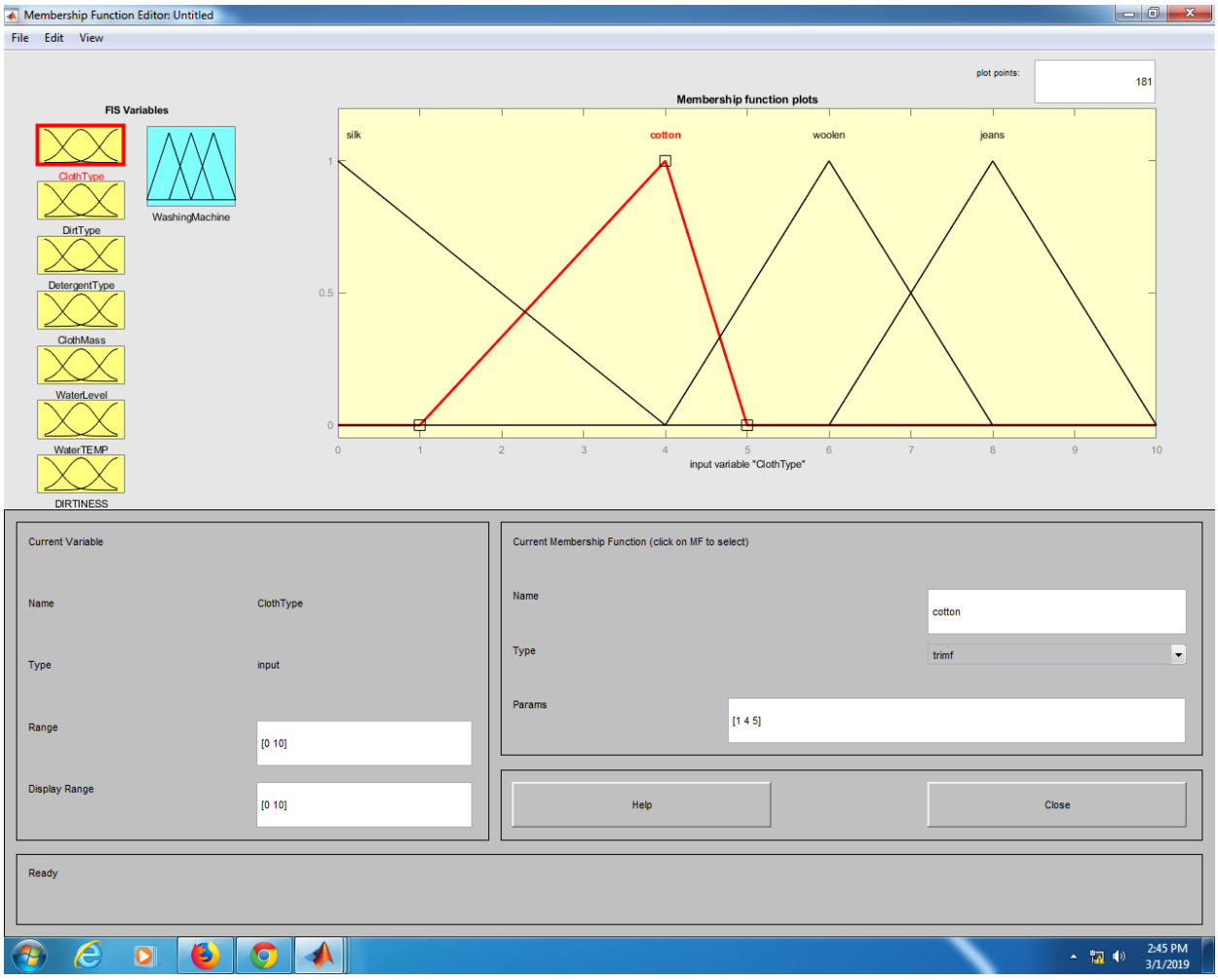
WashingMachine(VeryShort, Short, Medium, Large, VeryLarge)

Tip value is range from 0 – 10

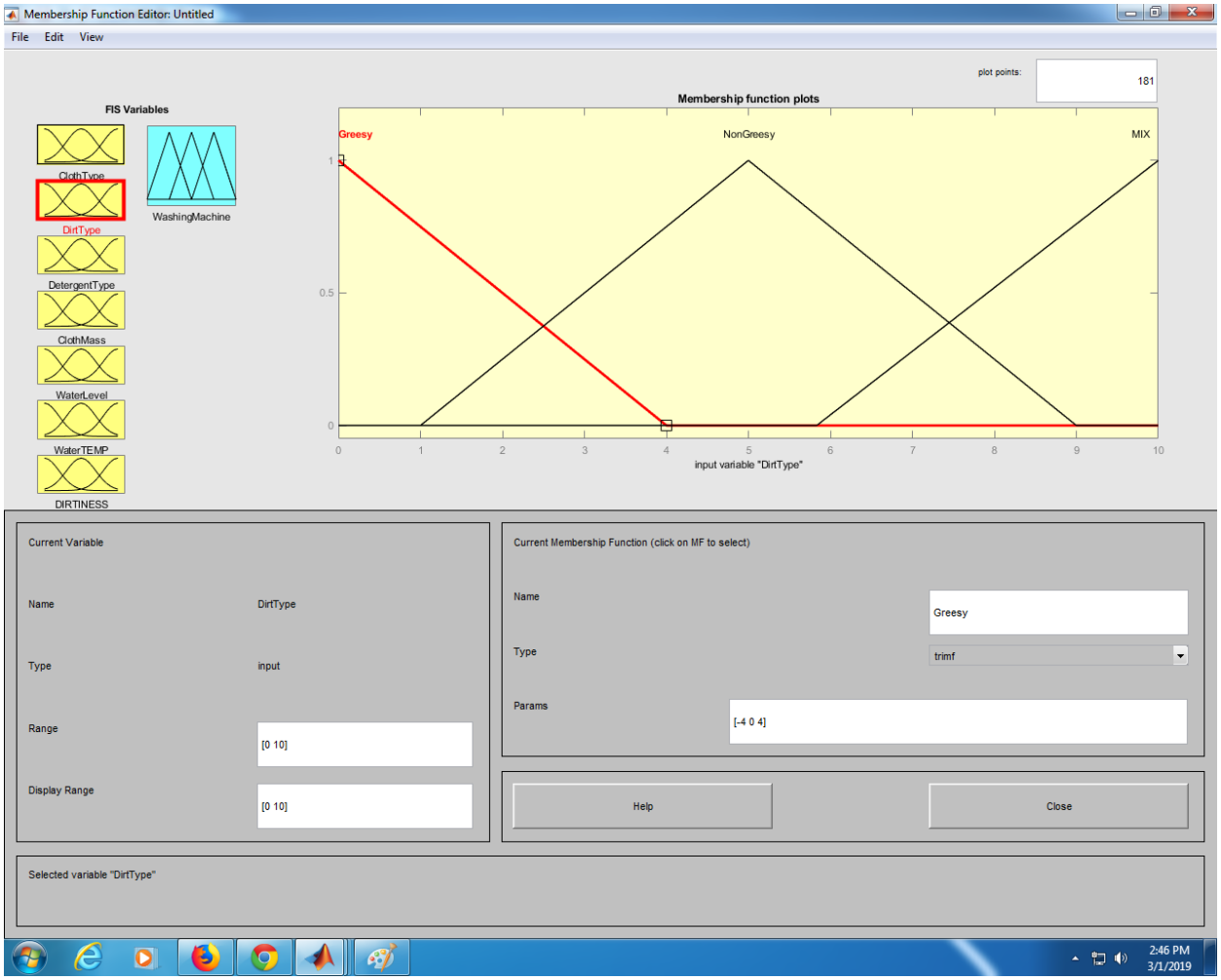
- FuzzySet logic for washing machine is as follow



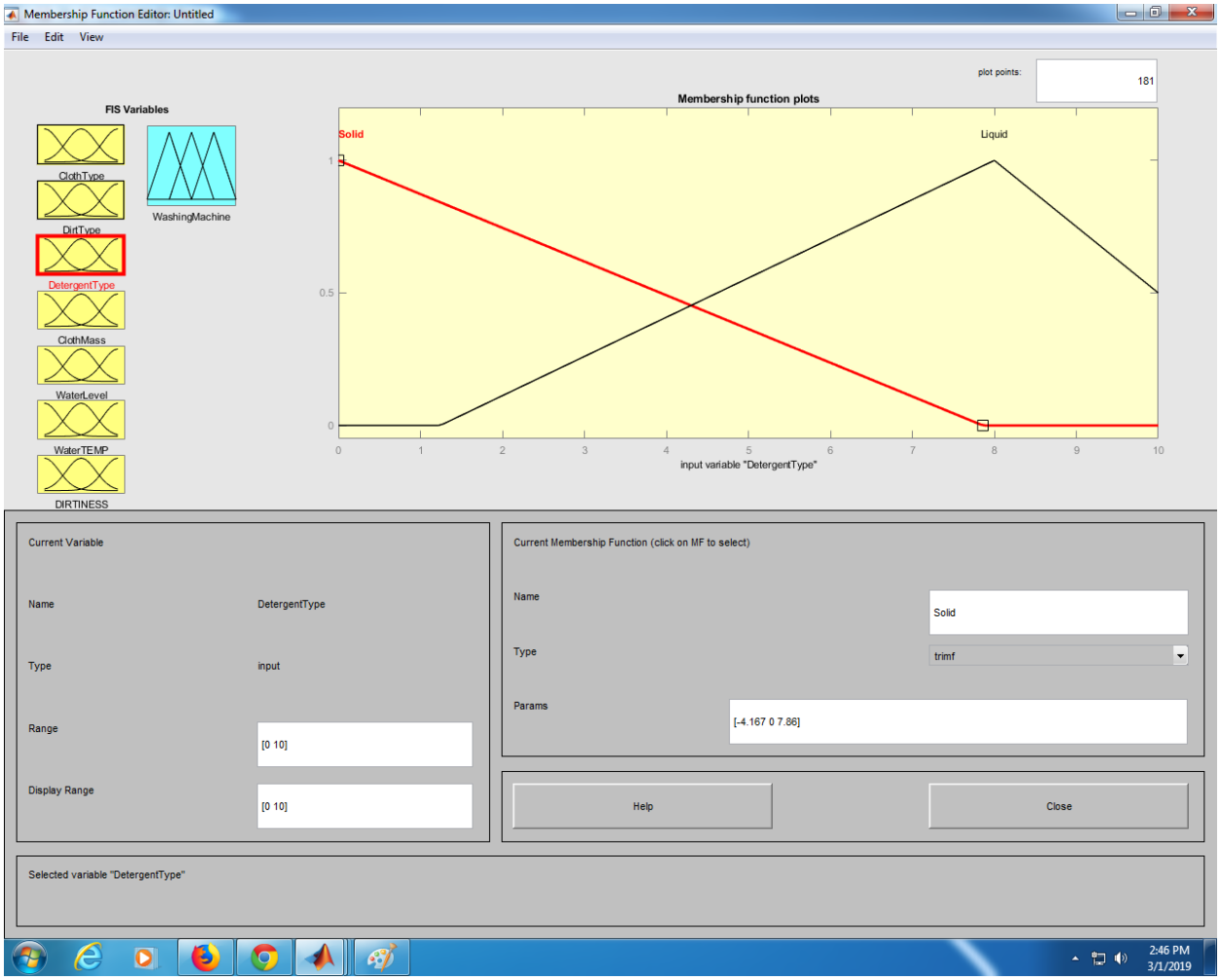
- <u>The values for CothType variable are selected for their respective ranges:-</u>



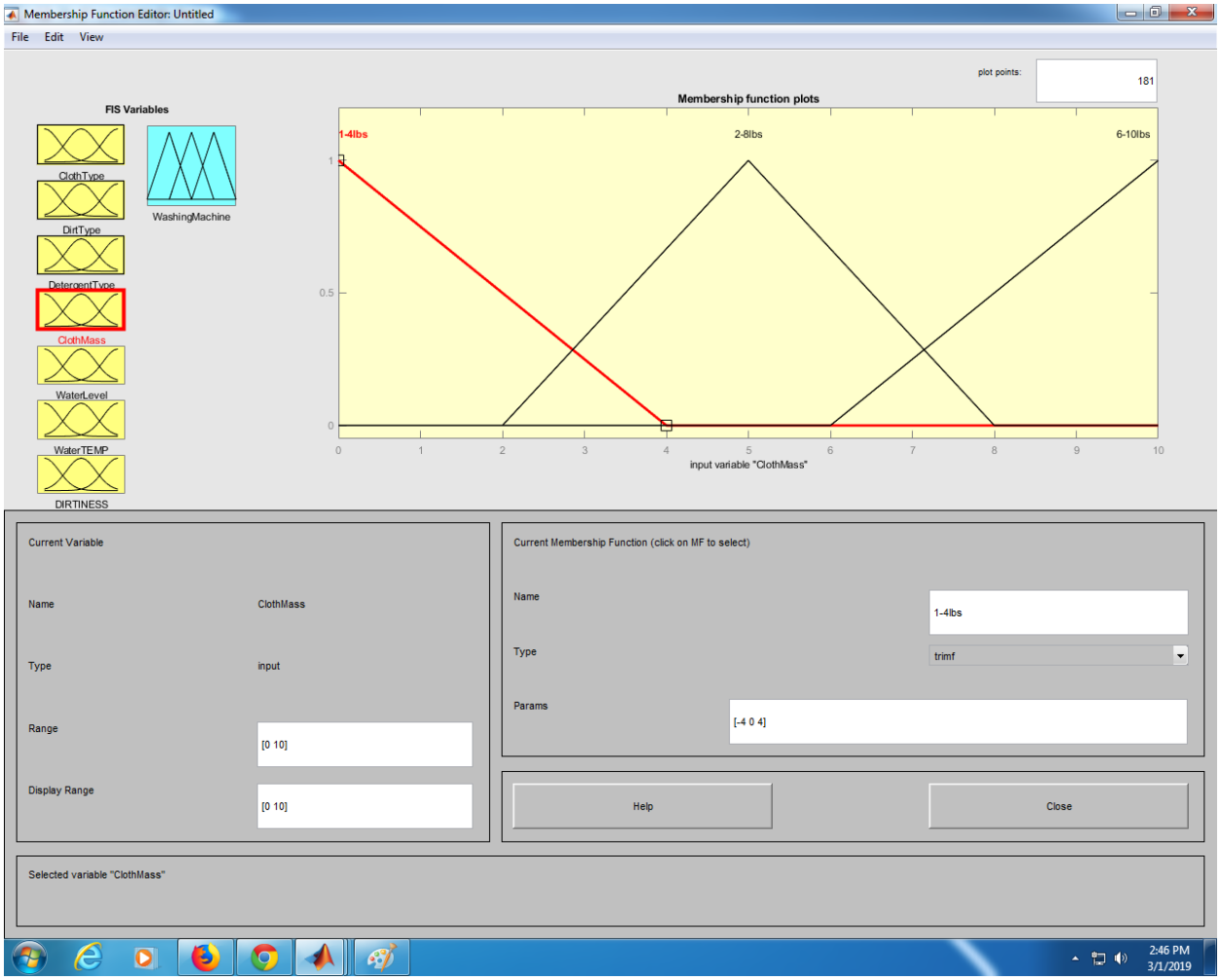
- <u>The values for DirtType variable are selected for their respective ranges:-</u>



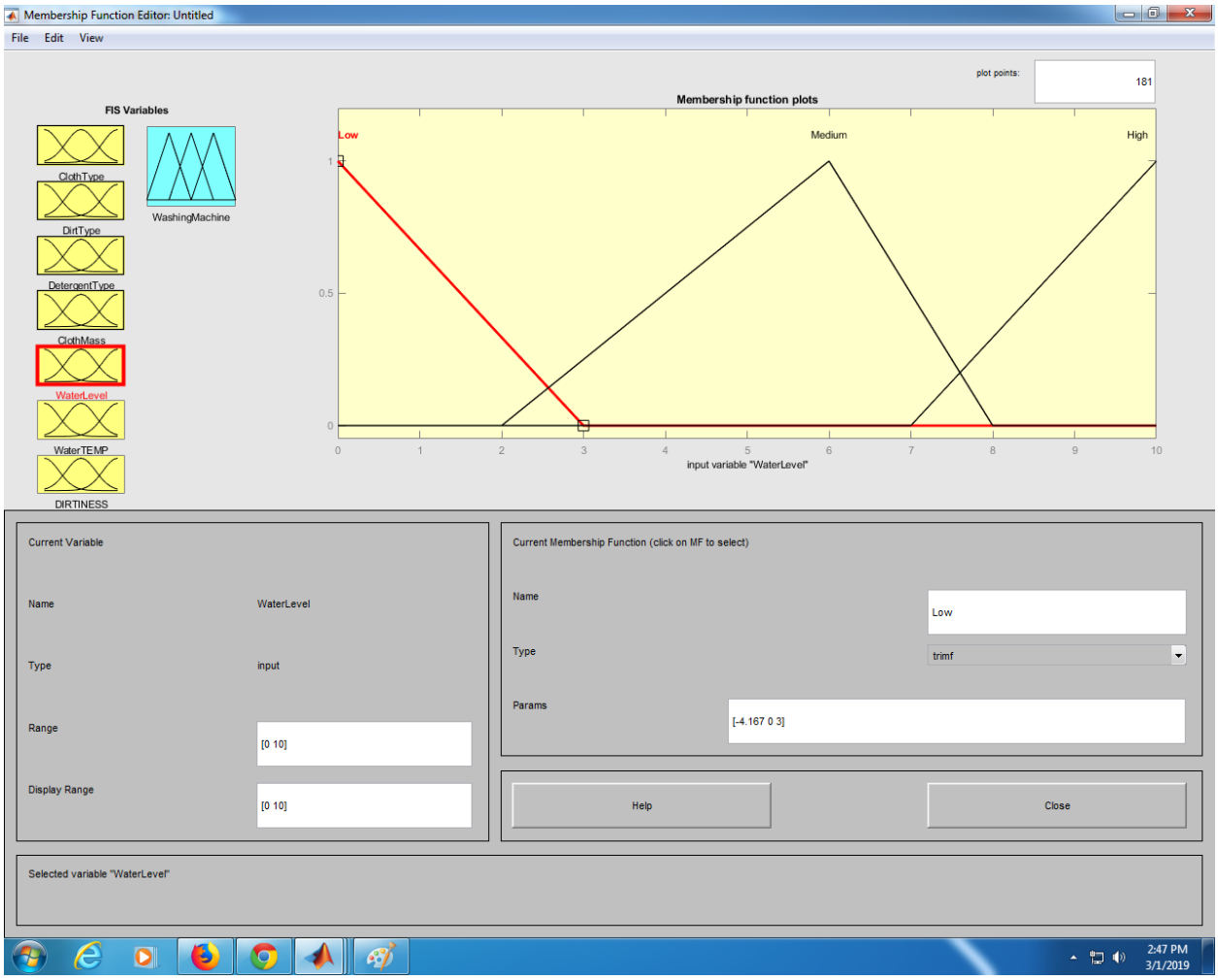
- The values for DetergentType variable are selected for their respective ranges:-



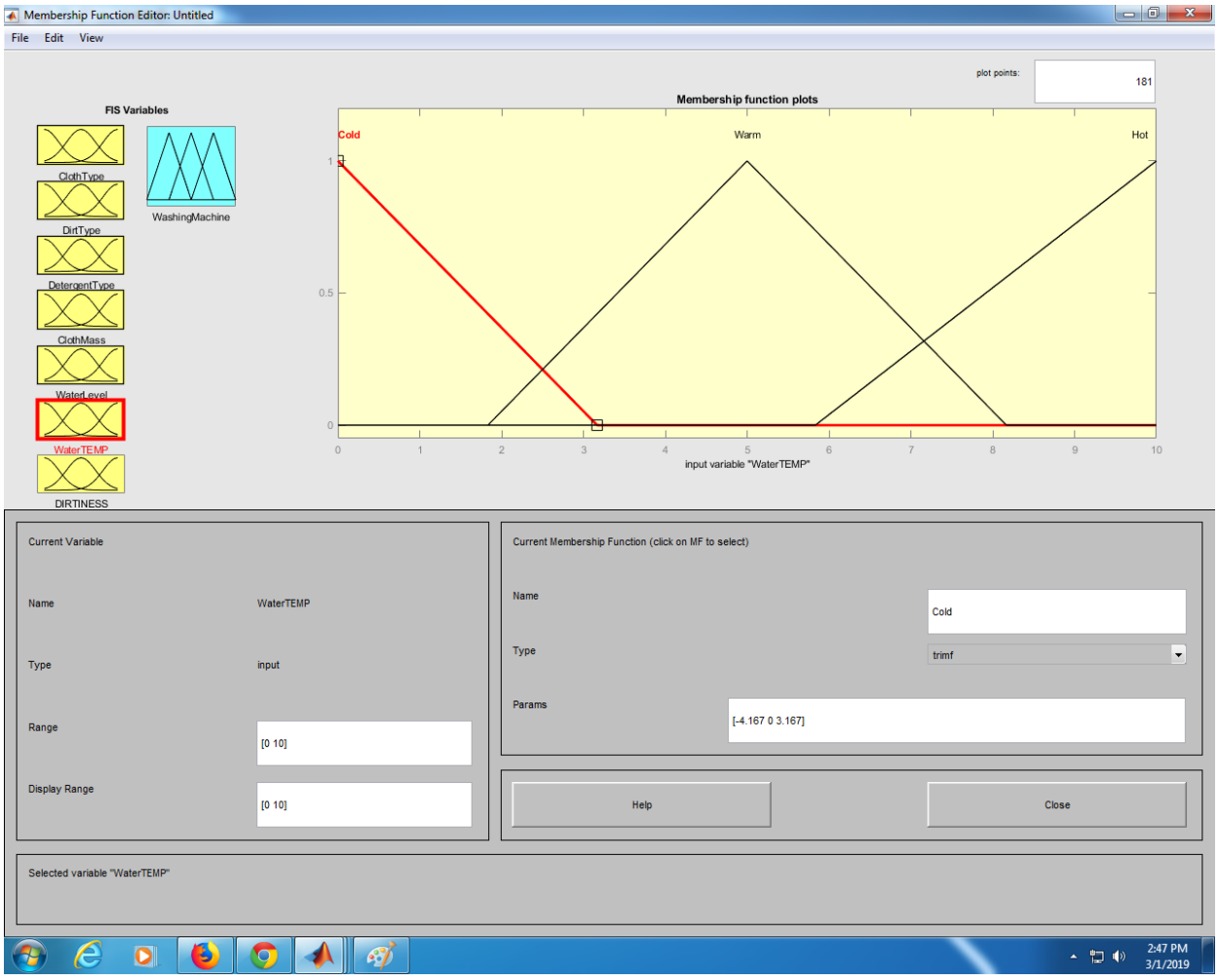
- The values for ClothMass variable are selected for their respective ranges:-



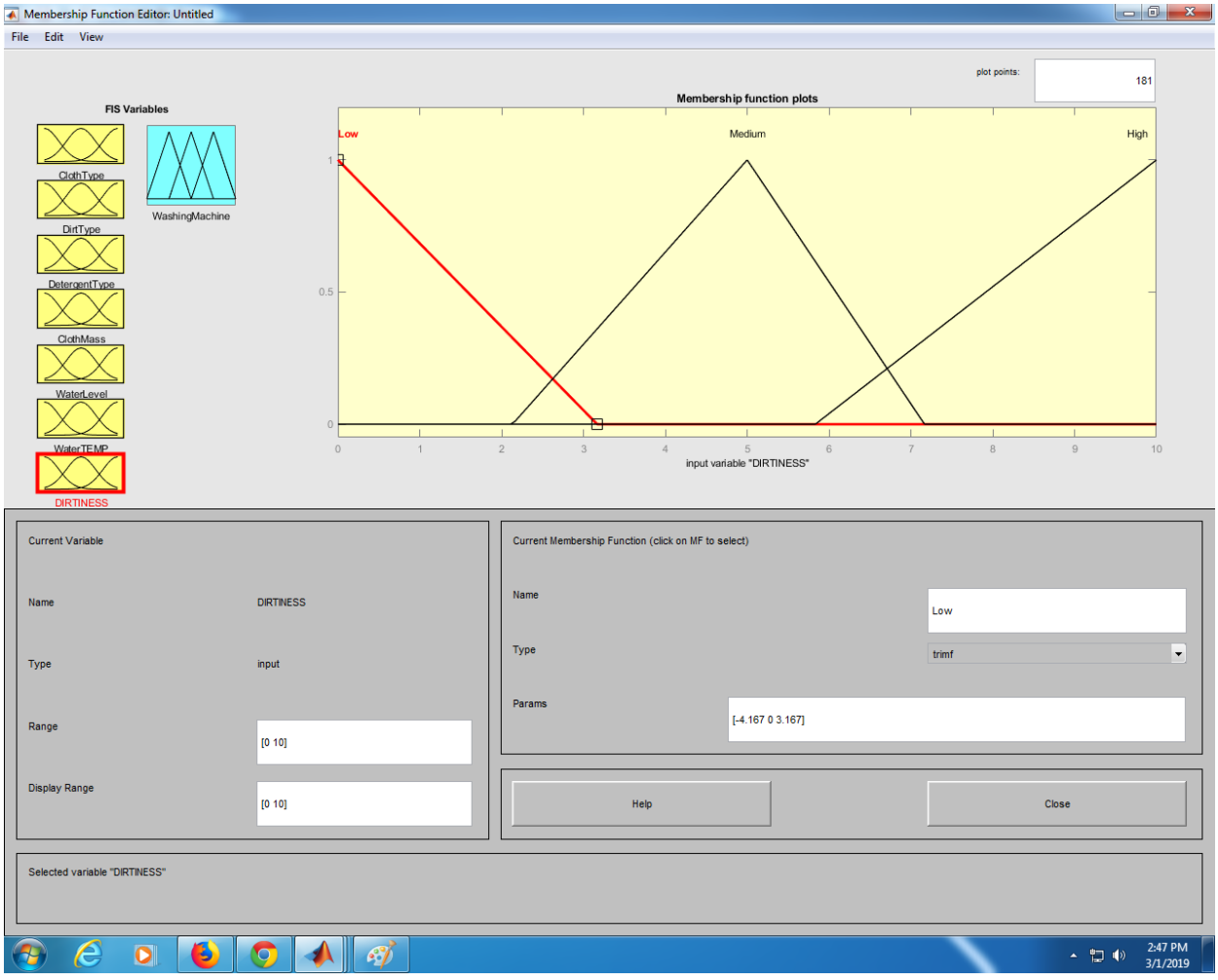
- <u>The values for WaterLevel variable are selected for their respective ranges:-</u>



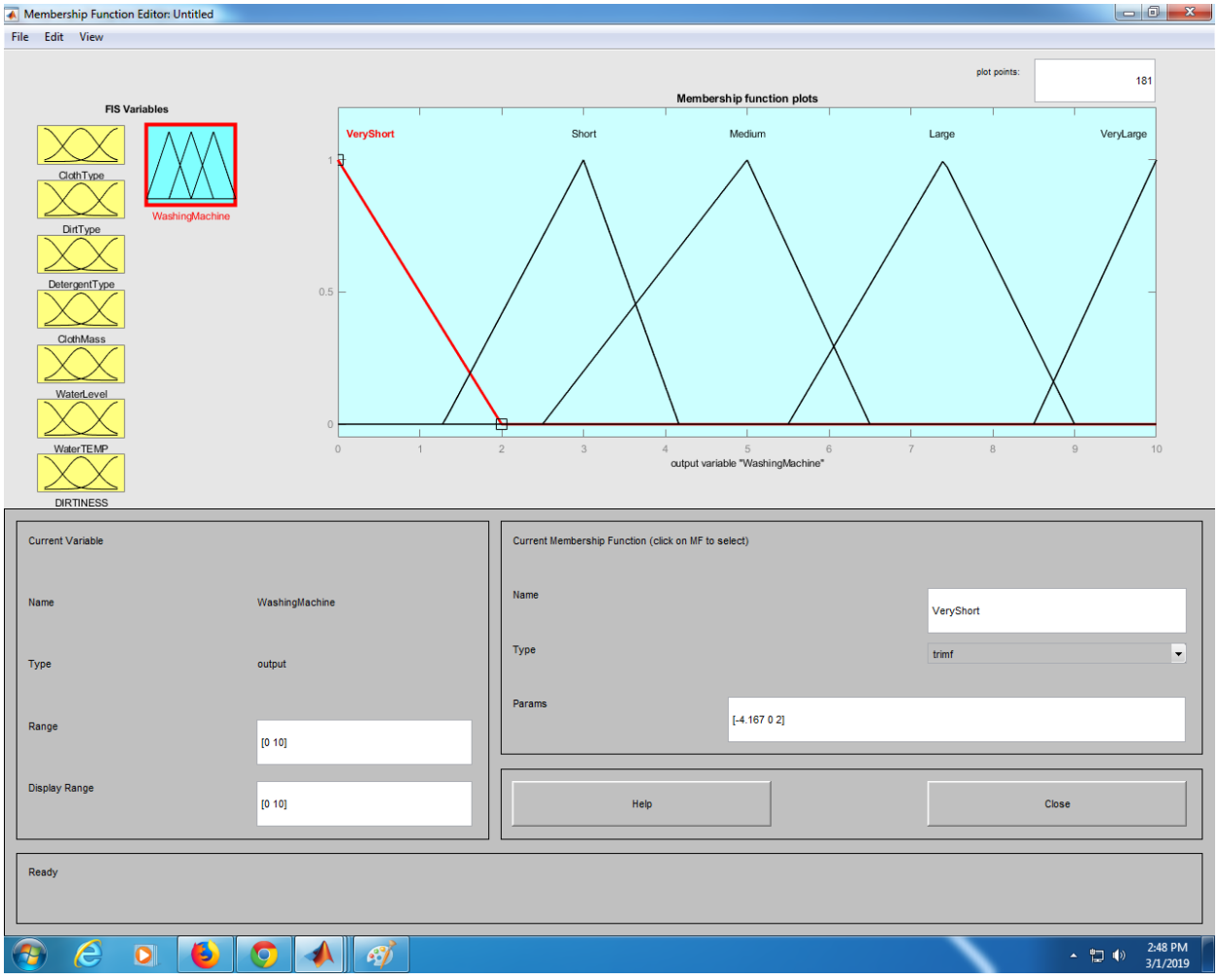
- <u>The values for WaterTEMP variable are selected for their respective ranges:-</u>



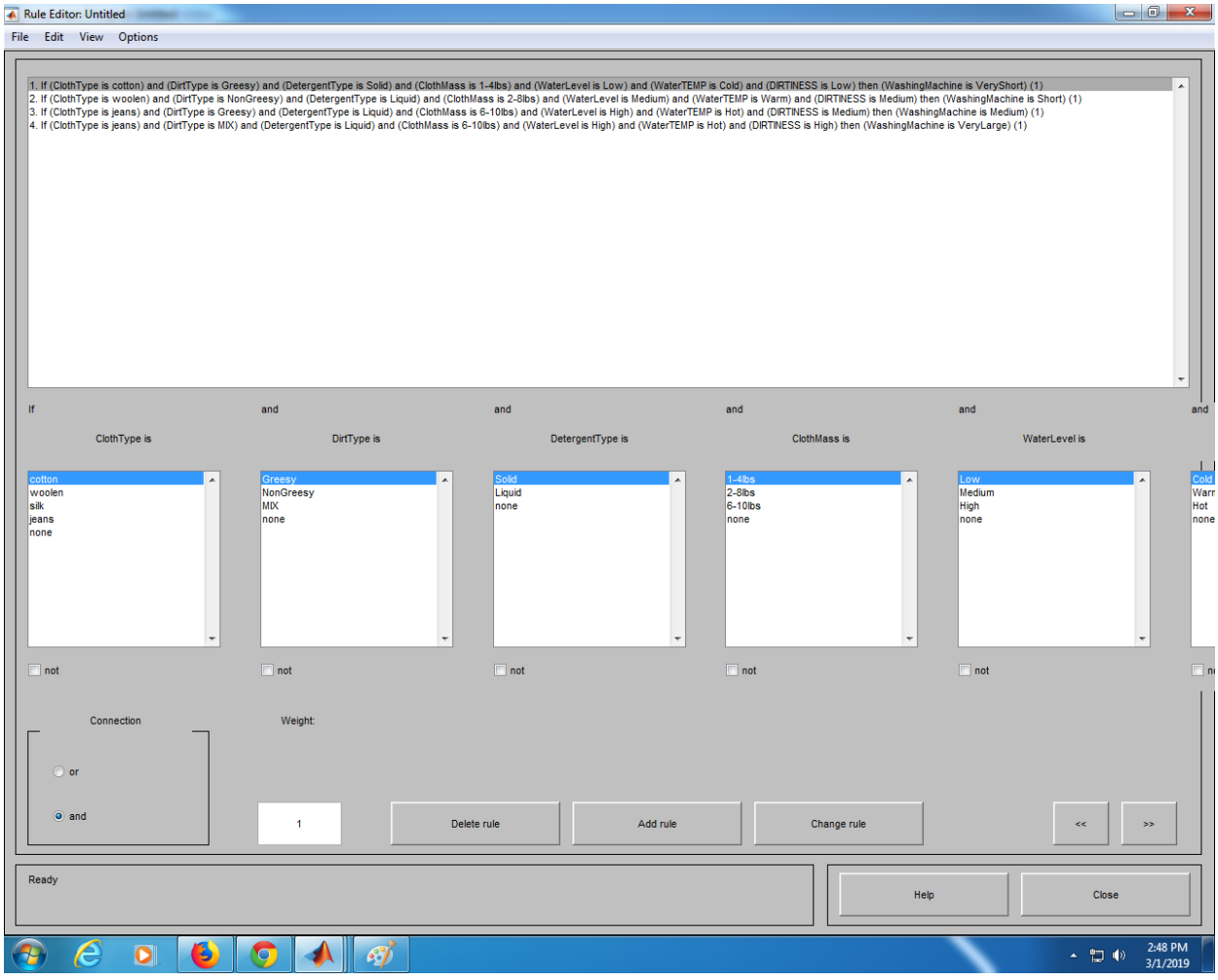
- <u>The values for DIRTINESS variable are selected for their respective ranges:-</u>



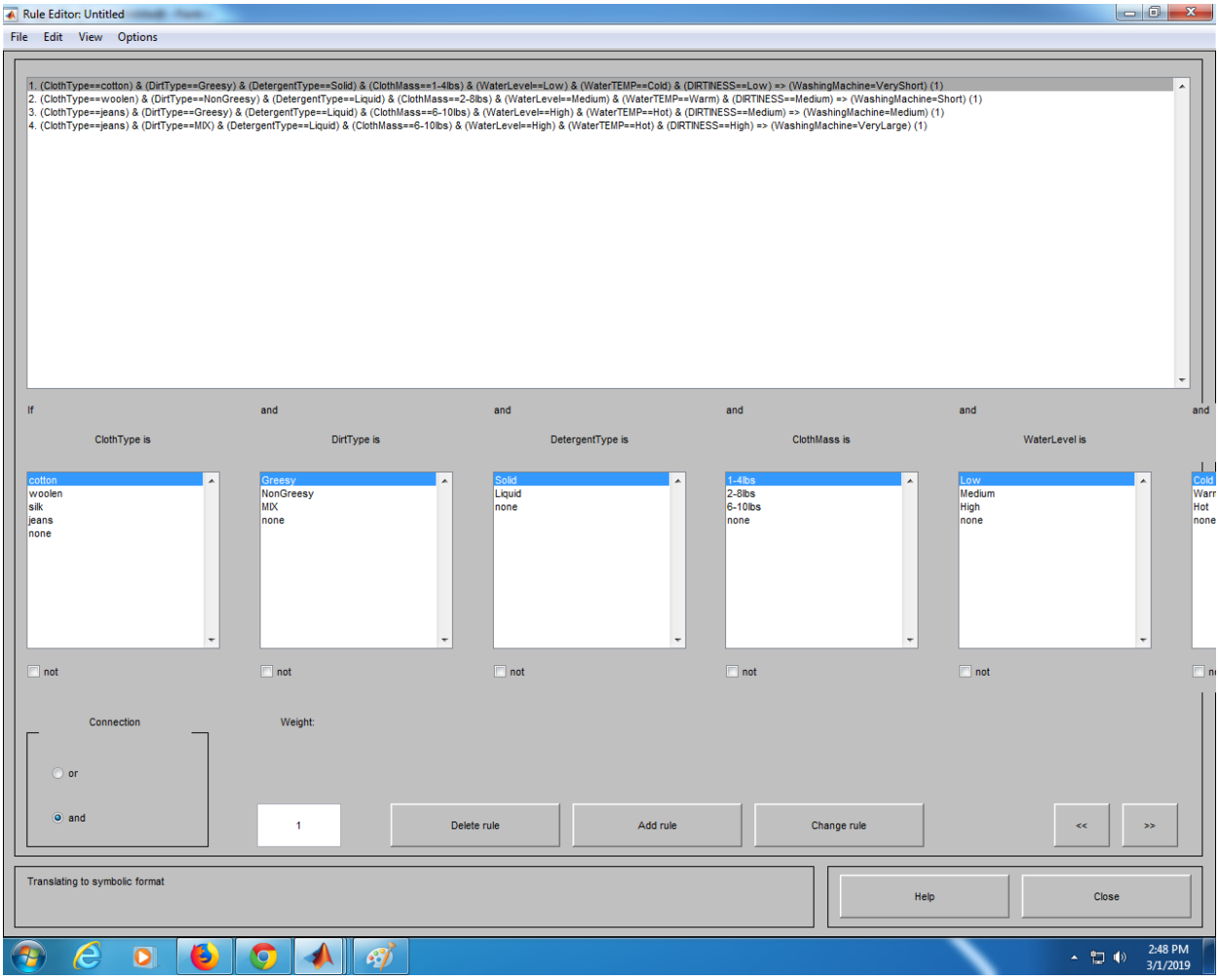
- The values for output WashingMachine variable are selected for their respective ranges:-



- Rule for washing machine is written as follow (Here I write only 4 rule) –

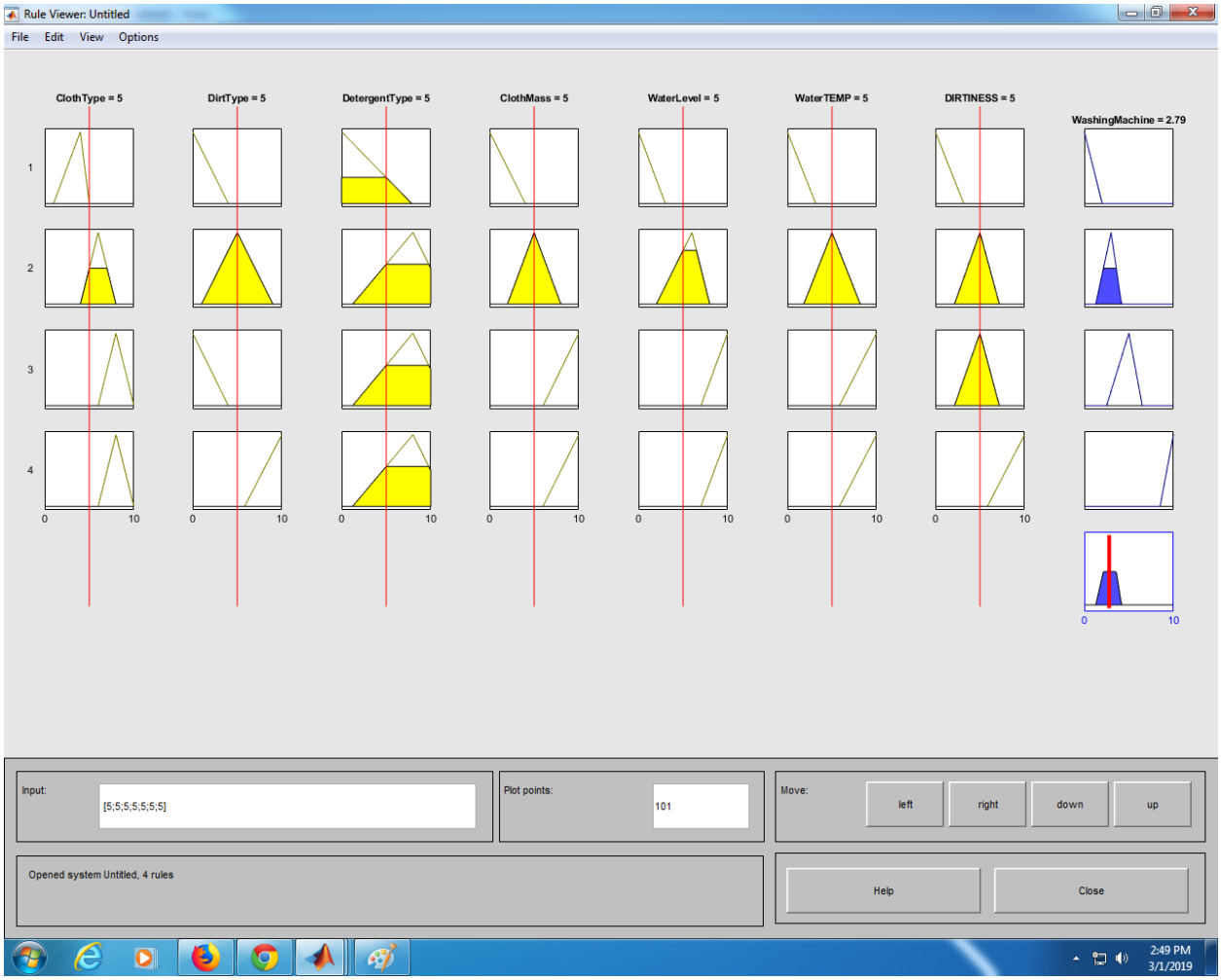


- Symbolic representation of rule is –

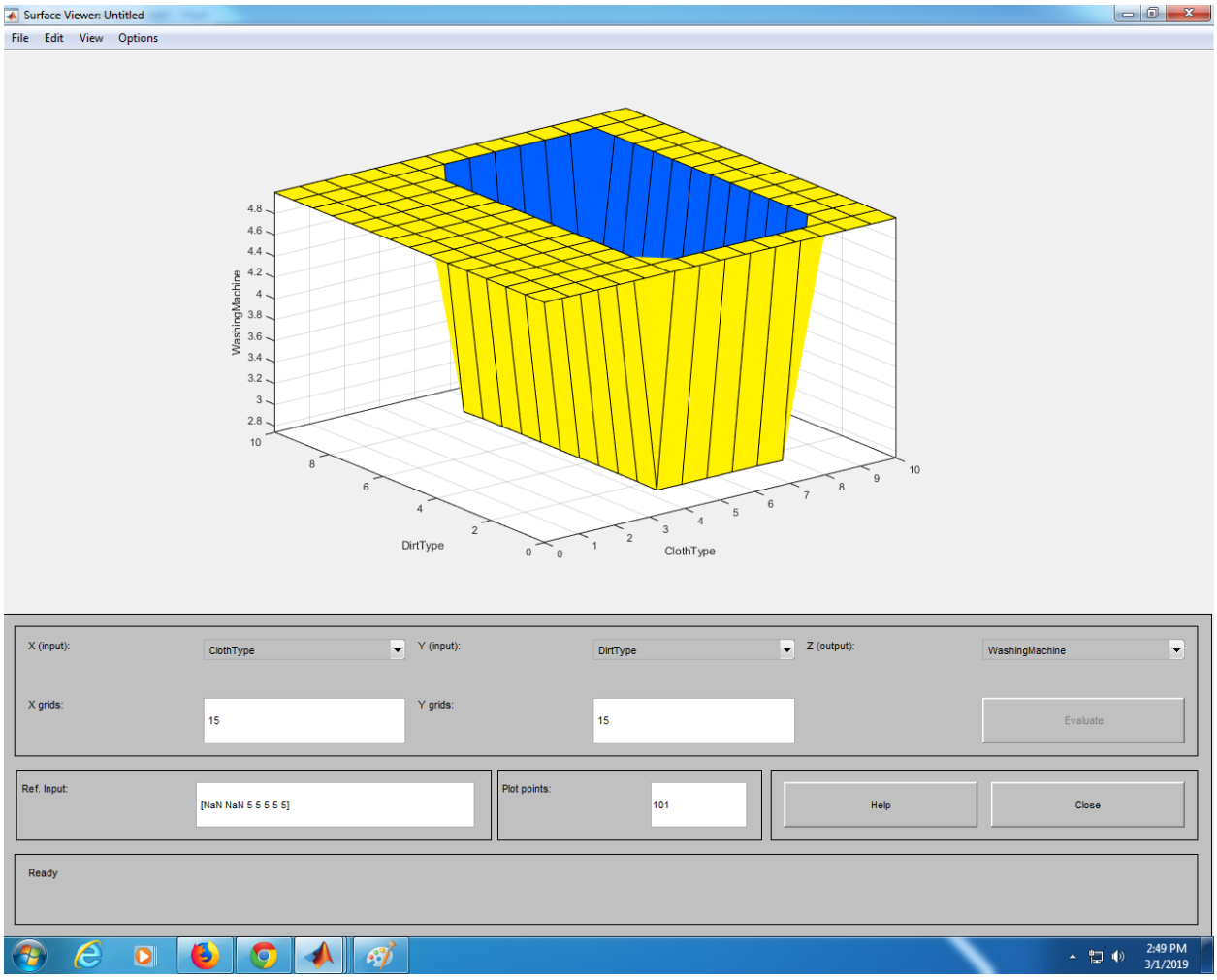


- Output of Washing Maching is display as –

1. Rule View Output



2. Surface Viewer Output


Surface Viewer: Untitled
File Edit View Options
WashingMachine
4.8
4.6
4.4
4.2
4
3.8
3.6
3.4
3.2
3
2.8
DirtType
10
8
6
4
2
0
ClothType
0
1
2
3
4
5
6
7
8
9
10
X (input):
ClothType
Y (input):
DirtType
Z (output):
WashingMachine
X grids:
15
Y grids:
15
Evaluate
Ref. Input:
[NaN NaN 5 5 5 5 5]
Plot points:
101
Help
Close
Ready
2:49 PM
3/1/2019