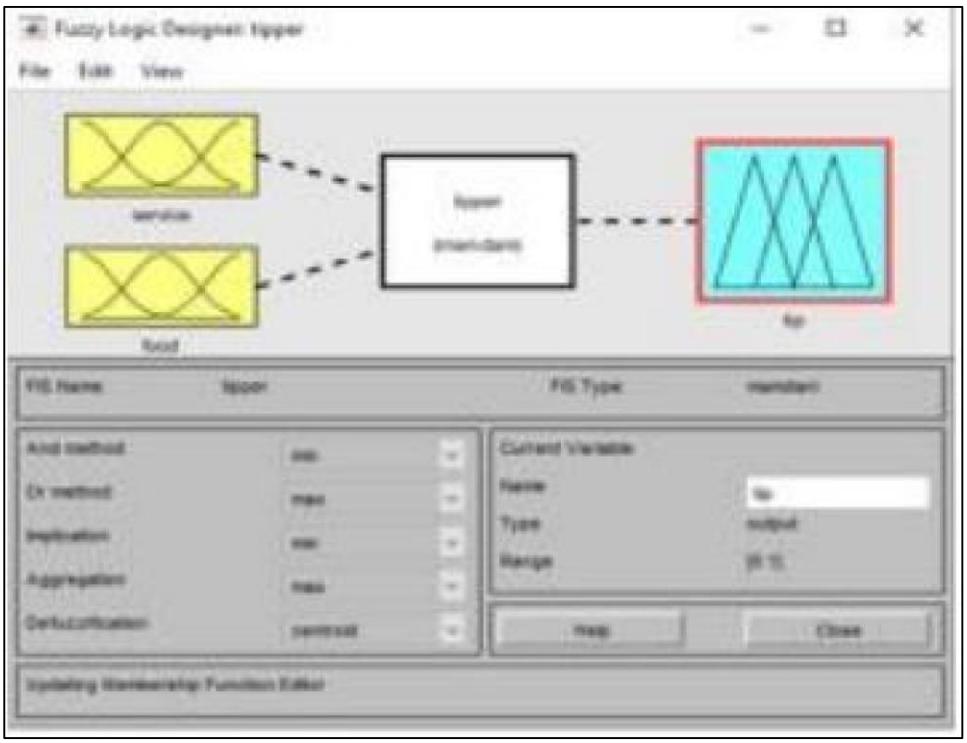
Ayesha Taufique CS-36

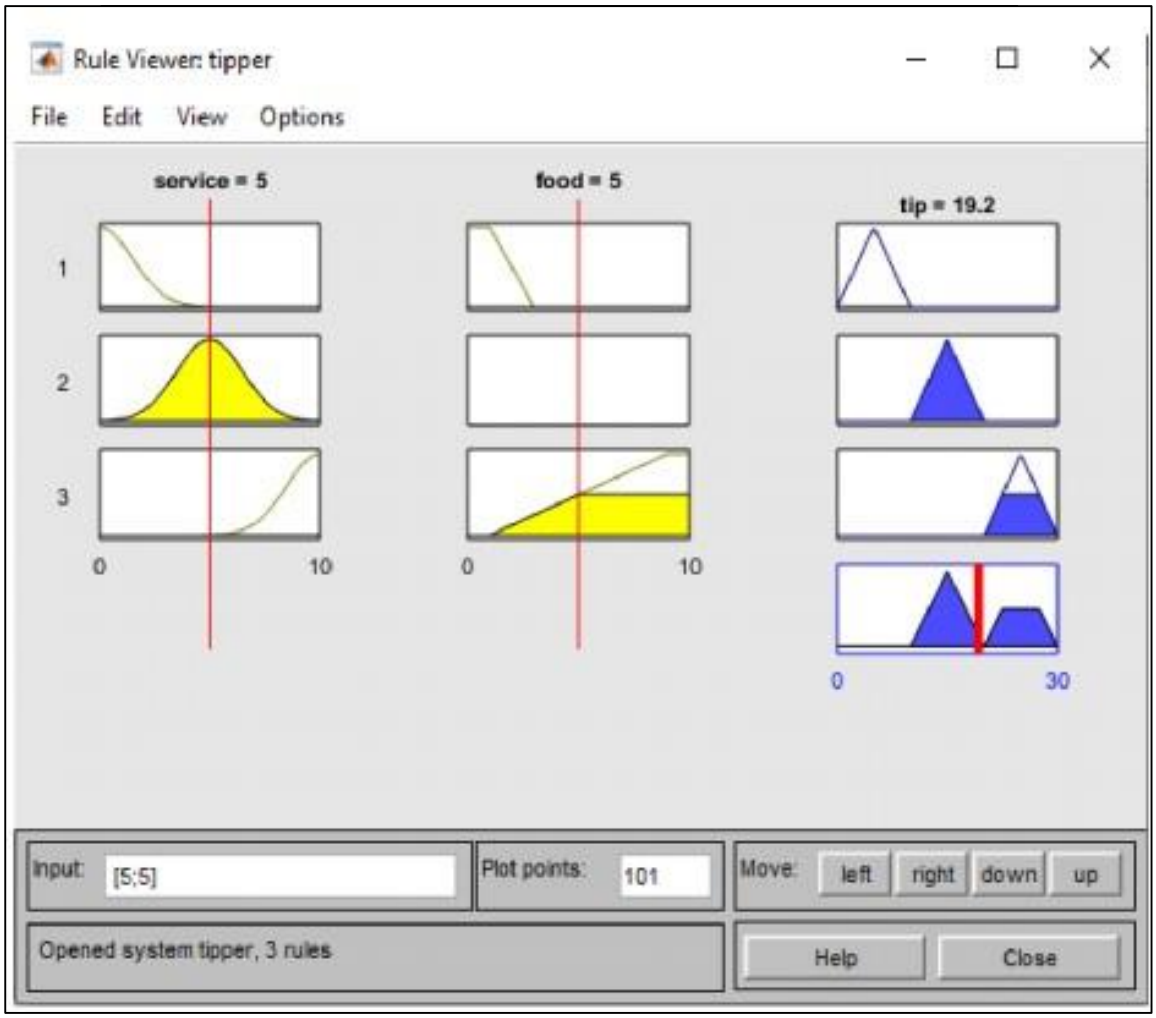
LAB SESSION 10

1) Implement the following rule set in matlab, to control the mechanism of a crane.

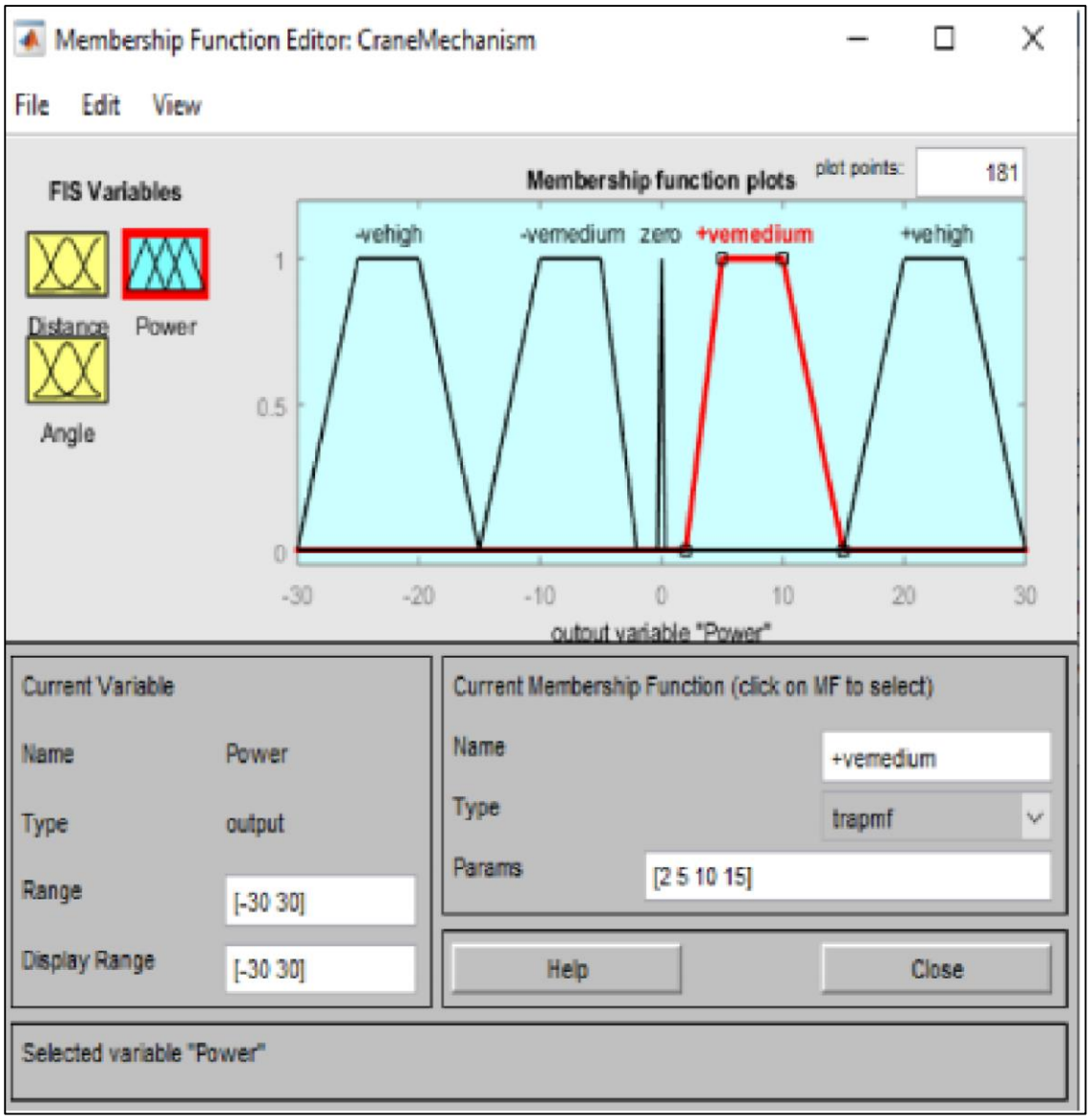
- **IF Distance is far AND Angle is zero THEN apply pos_medium Power**
- **IF Distance is far AND Angle is neg_small THEN apply pos_high Power**
- **IF Distance is medium AND Angle is neg_small THEN apply pos_high Power**
- **IF Distance is medium AND Angle is neg_big THEN apply pos_medium Power**
- **IF Distance is close AND Angle is pos_small THEN apply neg_medium Power IF Distance is close AND Angle is neg_small THEN apply pos_medium Power**
- **IF Distance is close AND Angle is zero THEN apply zero Power**
- **IF Distance is zero AND Angle is zero THEN apply zero Power**
- **IF Distance is zero AND Angle is pos_small THEN apply neg_medium Power Develop a fuzzy logic based application of your choice.**

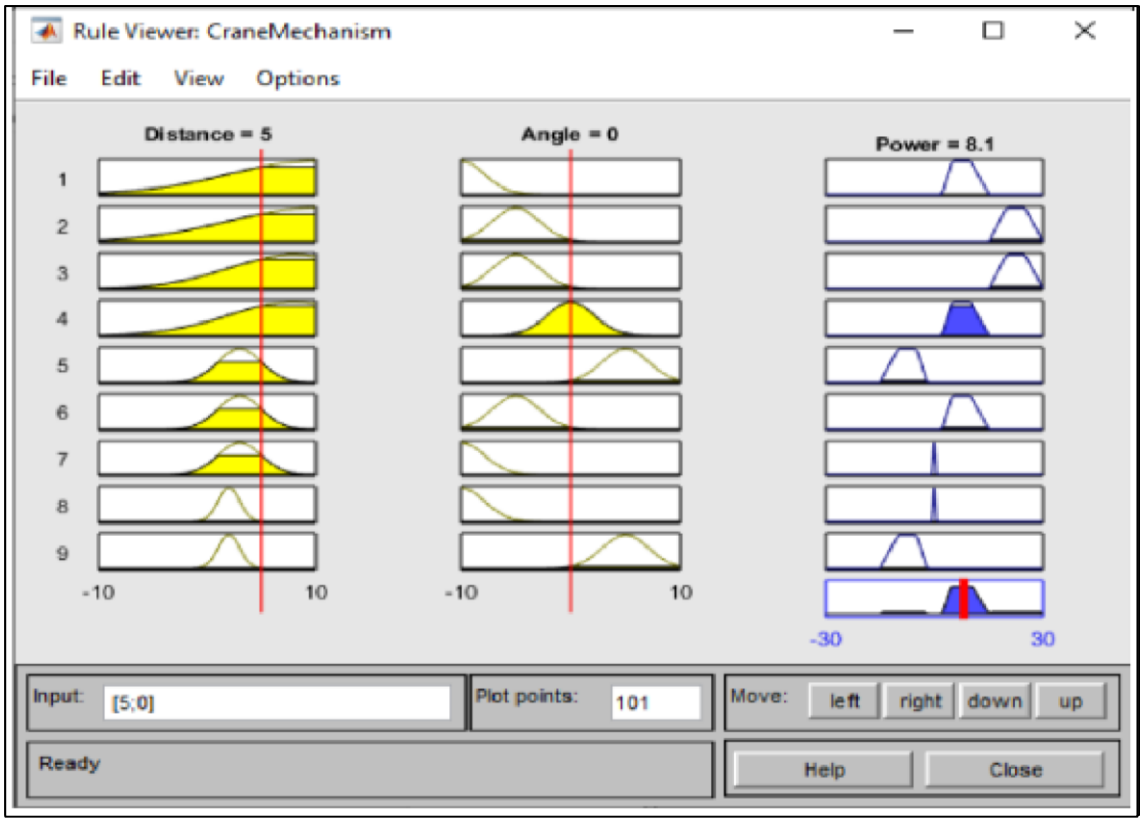
THE BASIC TIPPPING PROBLEM





2) Attach the screenshots of FIS editor, membership functions of all input & output parameters, rule editor and rule viewer.


Membership Function Editor: CraneMechanism
File Edit View
FIS Variables
Distance
Power
Angle
Membership function plots
plot points:
181
-vehigh
-vemedium
zero
+vemedium
+vehigh
1
0.5
0
-30
-20
-10
0
10
20
30
output variable "Power"
Current Variable
Name
Power
Type
output
Range
[-30 30]
Display Range
[-30 30]
Current Membership Function (click on MF to select)
Name
+vemedium
Type
trapmf
Params
[2 5 10 15]
Help
Close
Selected variable "Power"

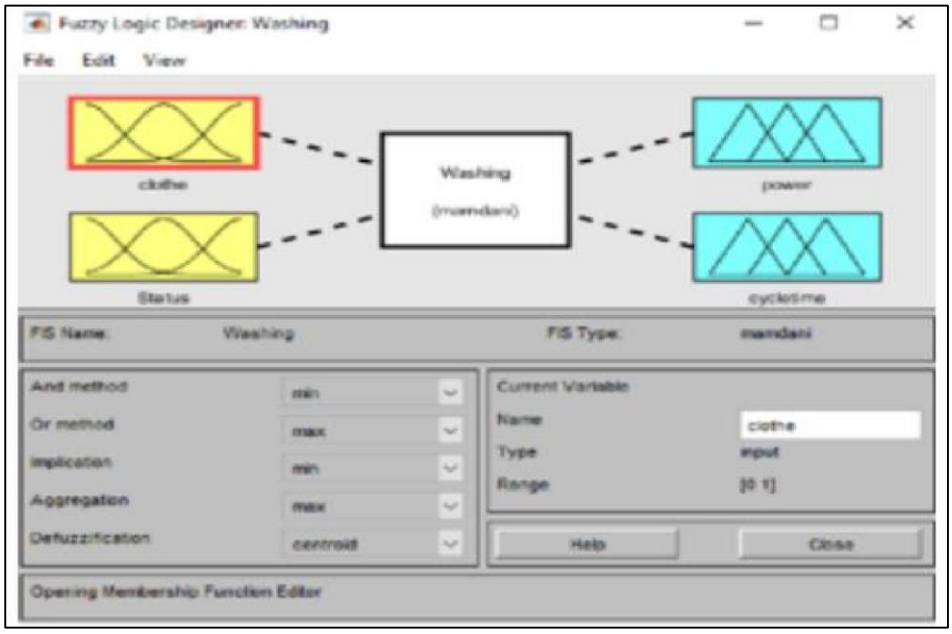


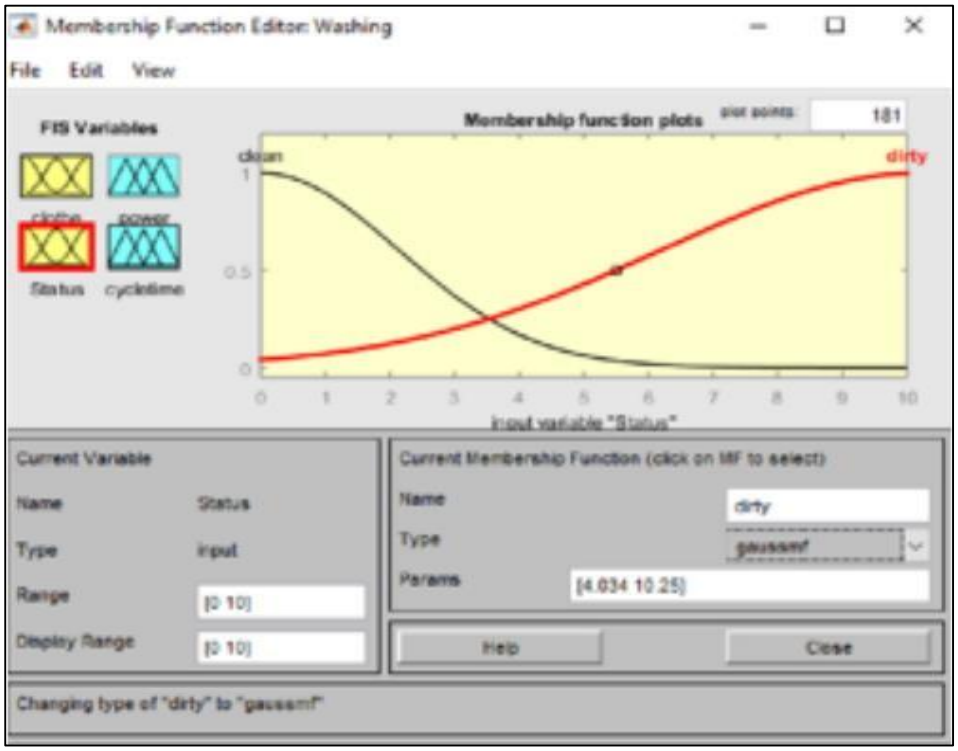
3) Implement the following rule set in matlab, to control the mechanism of a fuzzy logic based washing machine.

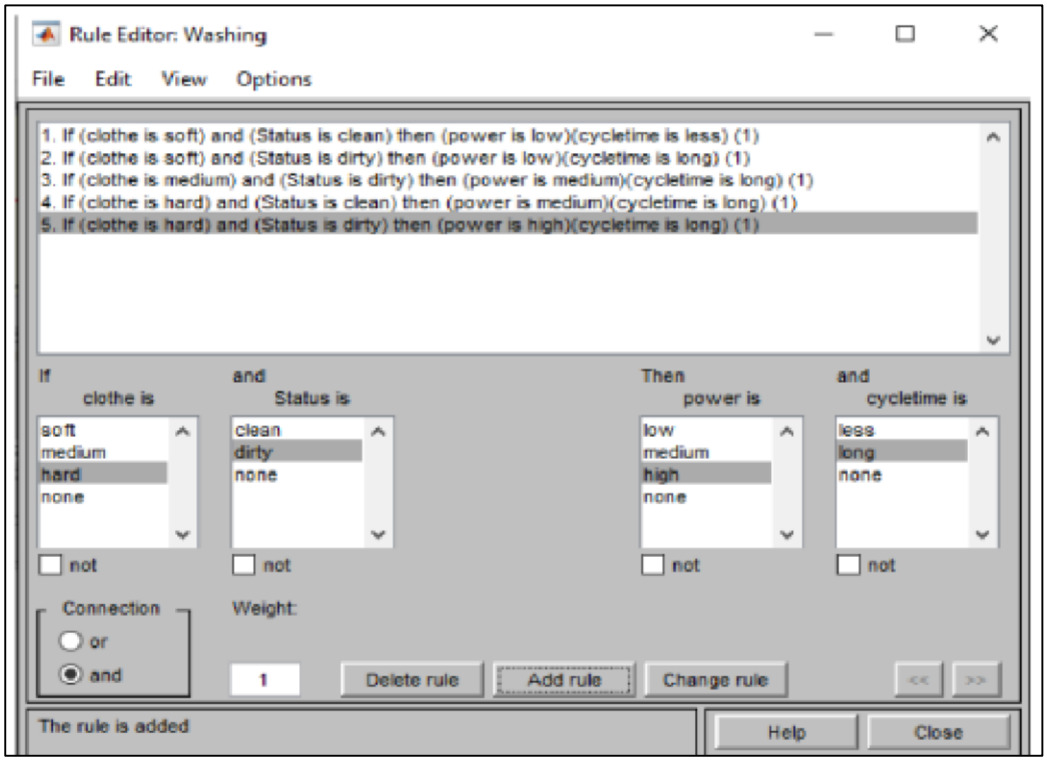
- **If clothe material is soft and status is clean then apply low power for less cycle time.**
- **If clothe material is soft and status is dirty then apply low power for long cycle time.**
- **If clothe material is medium and status is dirty then apply medium power for long cycle time.**
- **If clothe material is hard and status is clean then apply medium power for long cycle time.**
- **If clothe material is hard and status is dirty then apply high power for long cycle time.**

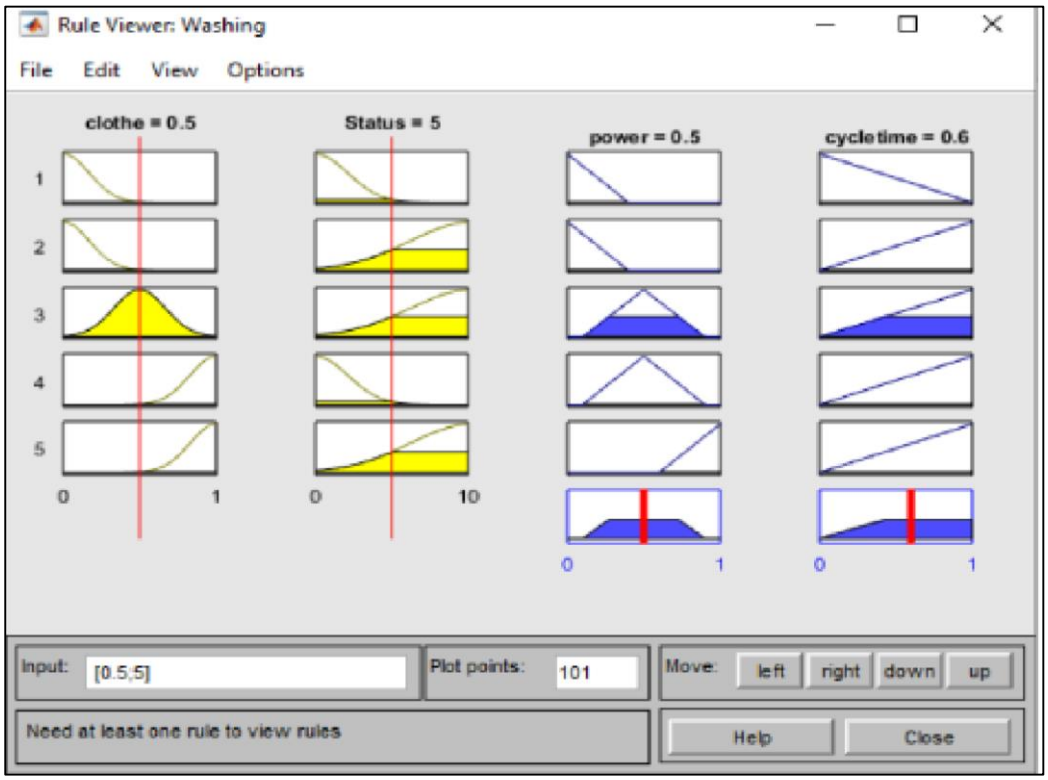
4) Attach the screenshots of FIS editor, membership functions of all input & output parameters, rule

editor and rule viewer.






Rule Editor: Washing
File Edit View Options
1. If (clothe is soft) and (Status is clean) then (power is low)(cycletime is less) (1)
2. If (clothe is soft) and (Status is dirty) then (power is low)(cycletime is long) (1)
3. If (clothe is medium) and (Status is dirty) then (power is medium)(cycletime is long) (1)
4. If (clothe is hard) and (Status is clean) then (power is medium)(cycletime is long) (1)
5. If (clothe is hard) and (Status is dirty) then (power is high)(cycletime is long) (1)
If
clothe is
soft
medium
hard
none
not
and
Status is
clean
dirty
none
not
Then
power is
low
medium
high
none
not
and
cycletime is
less
long
none
not
Connection
or
and
Weight:
1
Delete rule
Add rule
Change rule
<<
>>
The rule is added
Help
Close


Rule Viewer: Washing
File Edit View Options
clothe = 0.5
Status = 5
power = 0.5
cycletime = 0.6
1
2
3
4
5
0
1
0
10
0
1
0
1
Input:
[0.5,5]
Plot points:
101
Move:
left
right
down
up
Need at least one rule to view rules
Help
Close