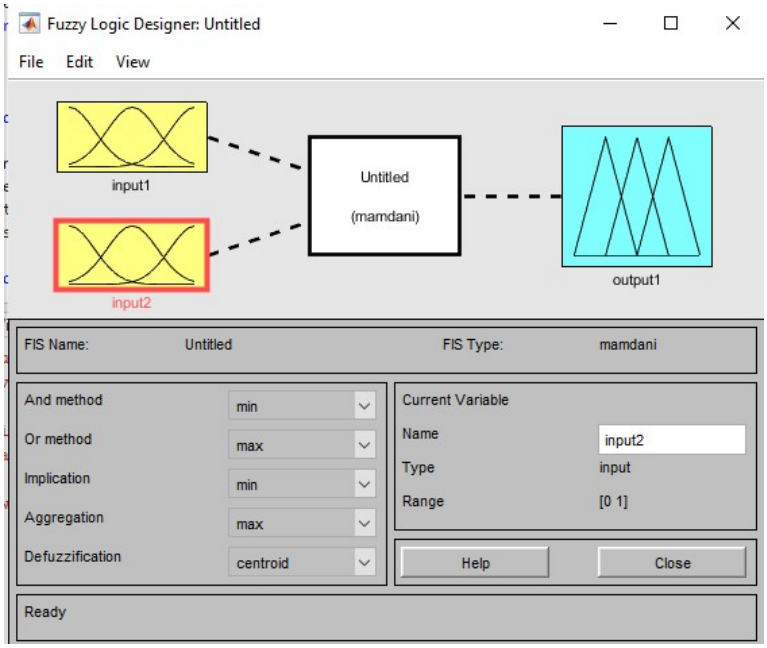
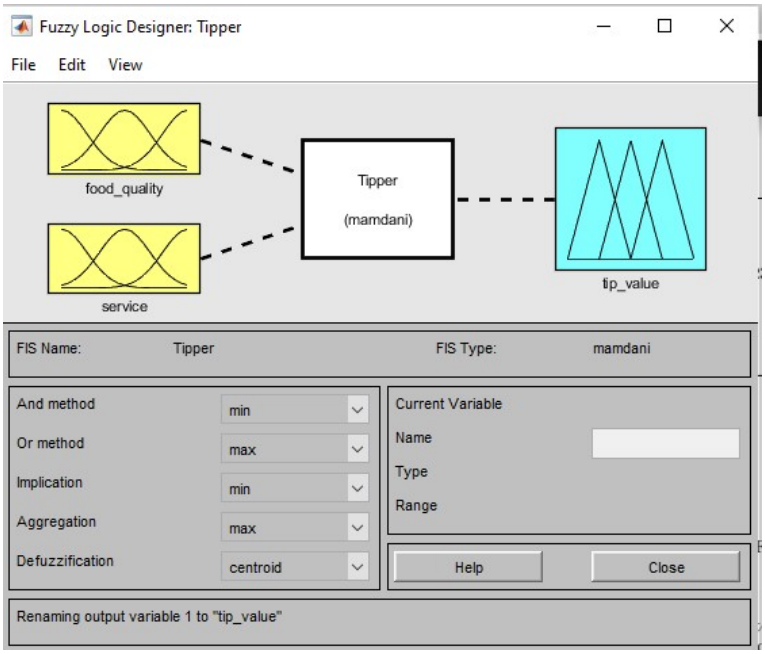
1. **Using FIS editor, model for tip value which should be given based on food quality and service. Food quality and service are taken as input and tip value as output.**

Below are the steps required for the implementation of tipping problem using FIS.

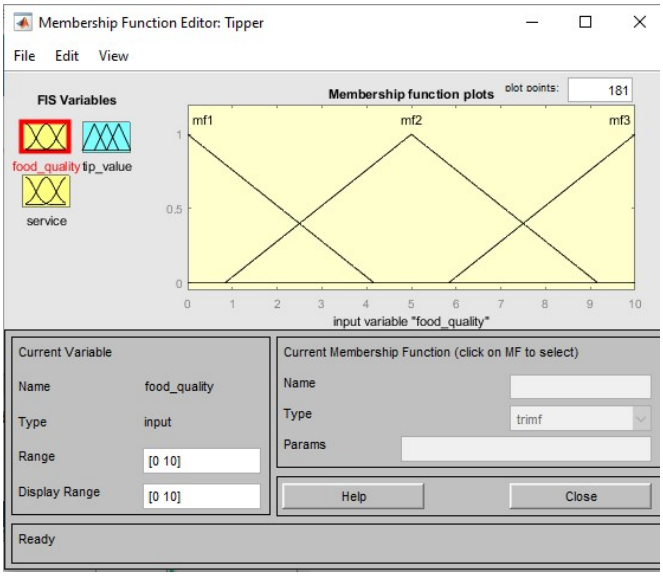
1. Under the App icon in Matlab, select the Fuzzy Logic Designer and open it. Below is the screenshot of it.

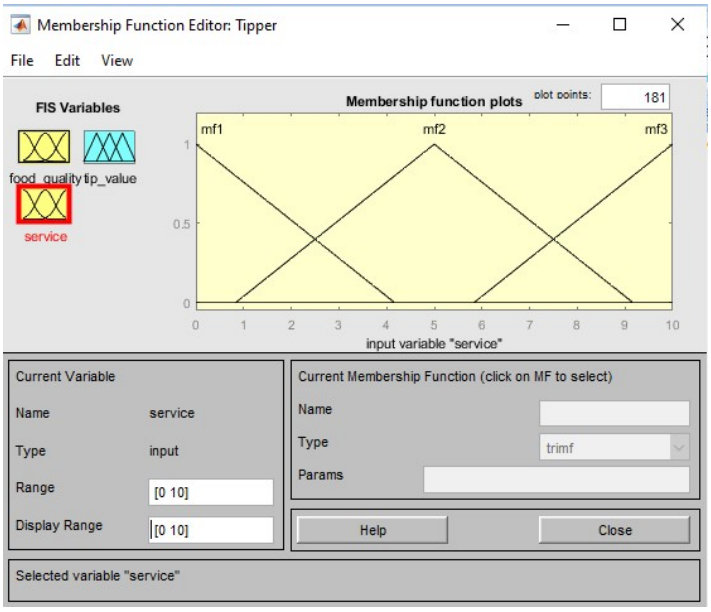


2. Defining the inputs as food_quality and the service and the output as tip_value.

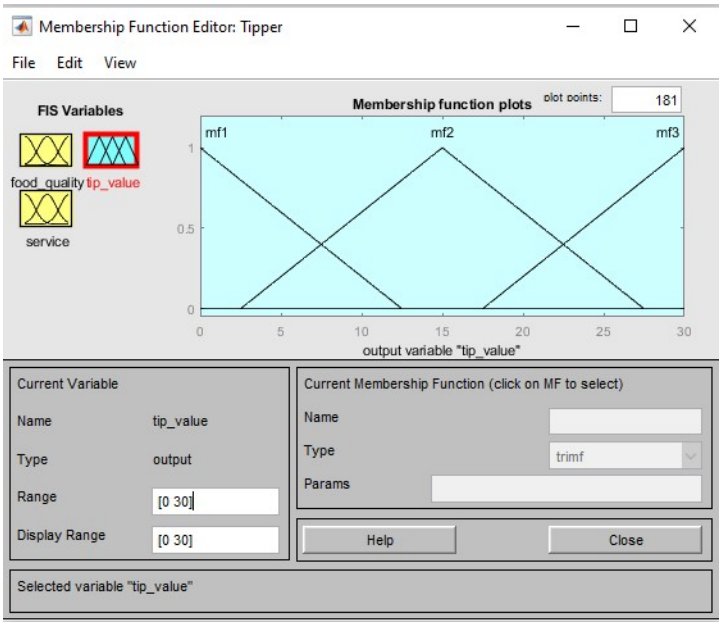


3. Defining the range for food_ quality as [0 10] and membership function as triangular ("trimf"). Doing the same for another input service. Below are the screenshots for the same.

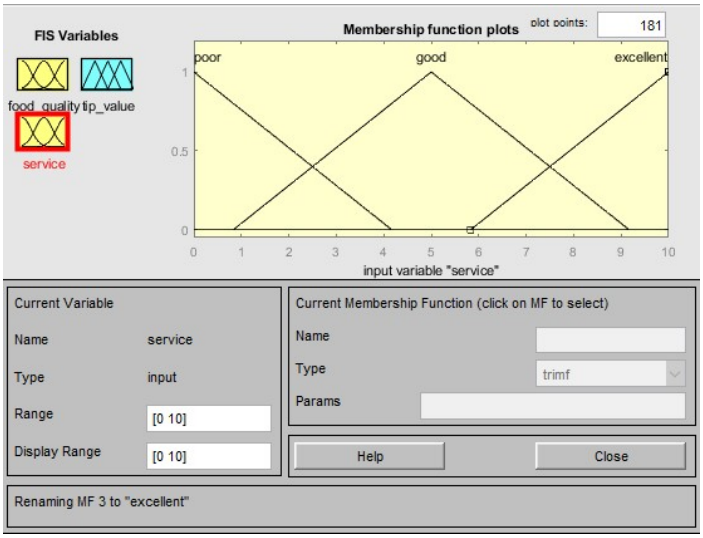




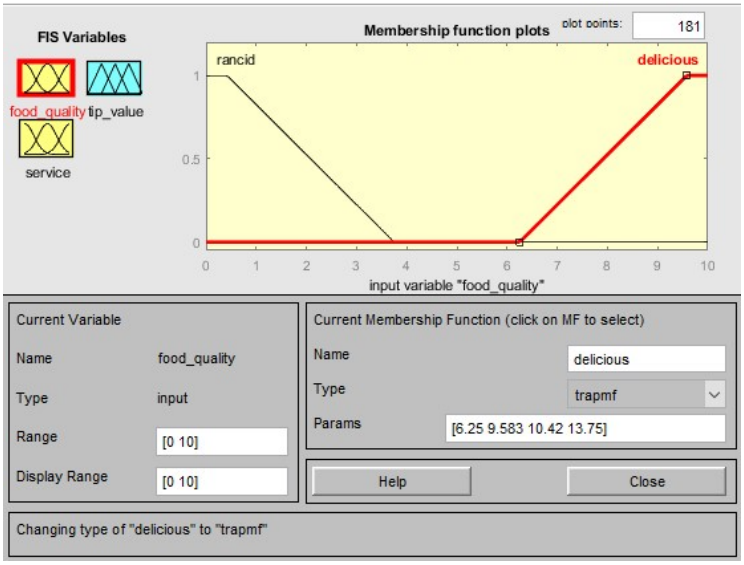
Defining the range of the output that is tip_value as [0 30] and membership function as triangular. Below is the screenshot for the same:



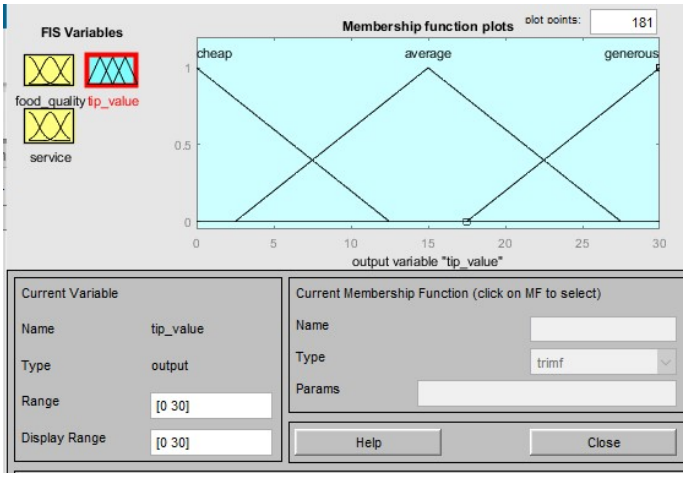
Renaming the membership functions of service input as poor , good and excellent.



Renaming the membership functions of food_quality input as rancid and delicious.

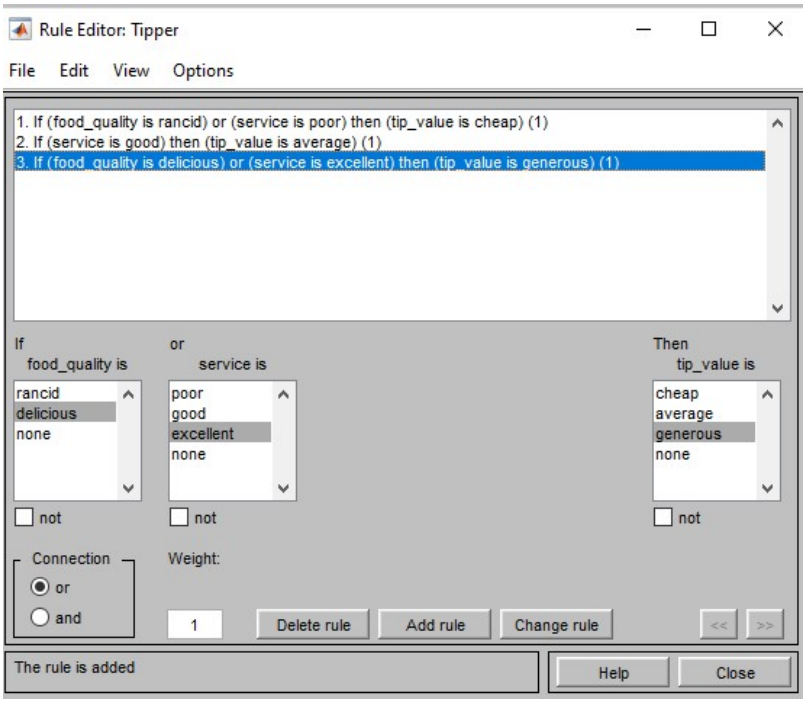


Finally renaming the membership functions of tip_value as cheap,average and generous.

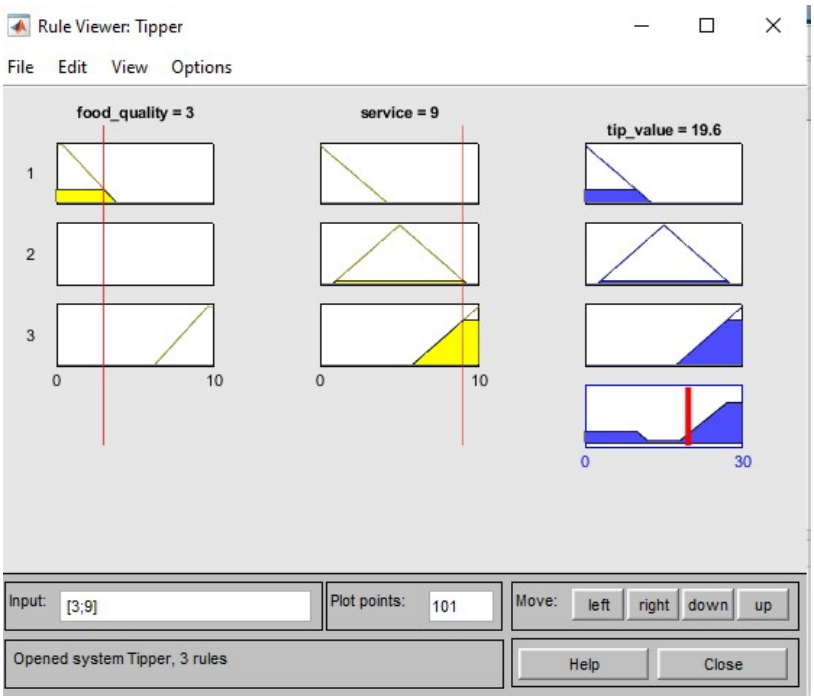


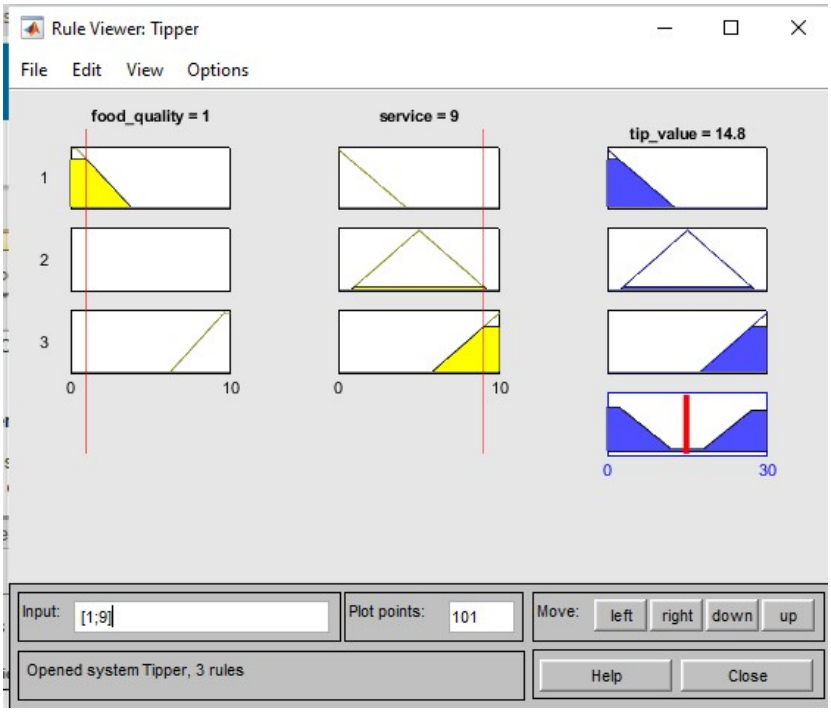
Defining the following rules.

1. If the service is poor or the food is rancid, then the tip is cheap.
2. If the service is good, then the tip is average.
3. If the service is excellent or the food is delicious, then the tip is generous.



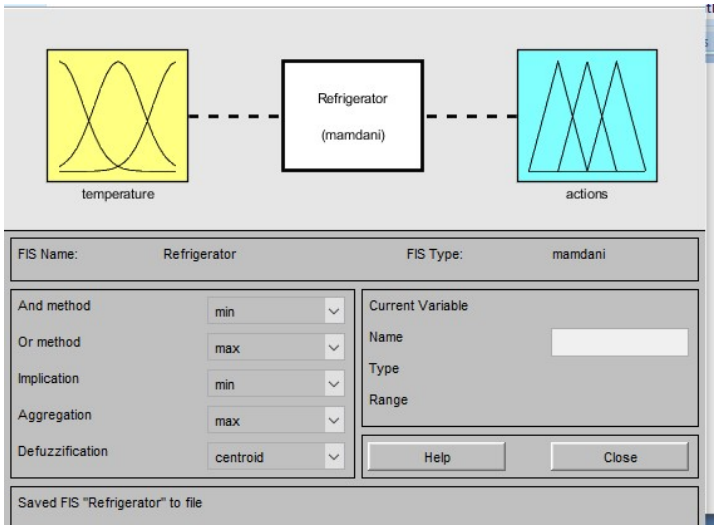
In the Rule Inference, we specify values to the input variables, inspect the inference process, and view the resulting output value.



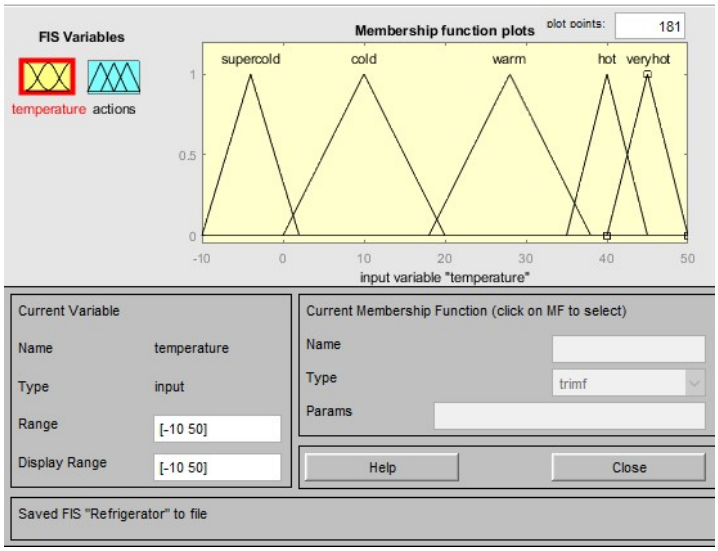


2. **Fuzzy logic can be used to control household appliances such as washing machine, refrigerator, etc. Use FIS editor to map temperature scale for anti lock brakes where input variable as supercold, cold, warm, hot, very hot. Consider output action as coldAirIn, LittleColdAirIn, NoAirInOut, LittleHotAirIn, HotAirIn.**

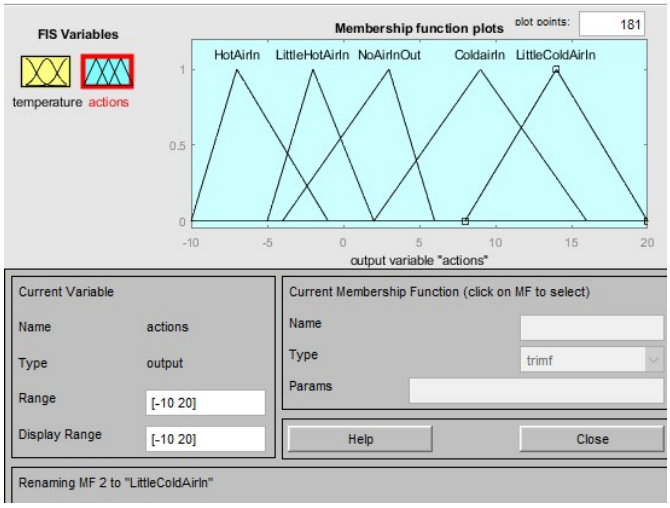
Inputs and outputs :



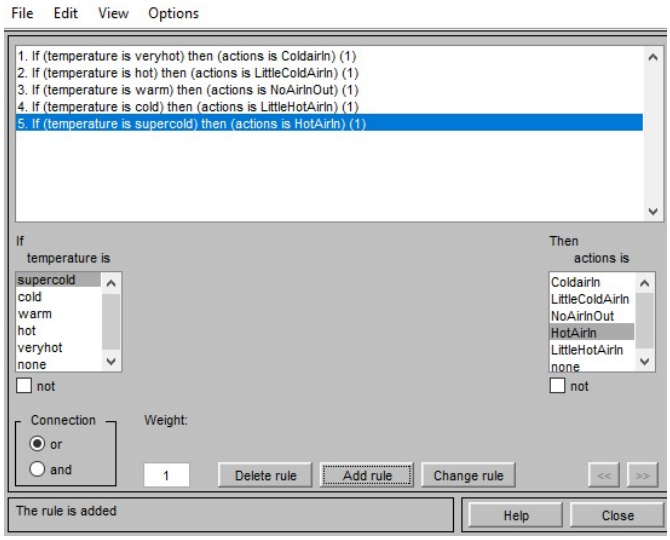
Defining the below linguistic variables for input temperature as supercold, cold, warm, hot, very hot.



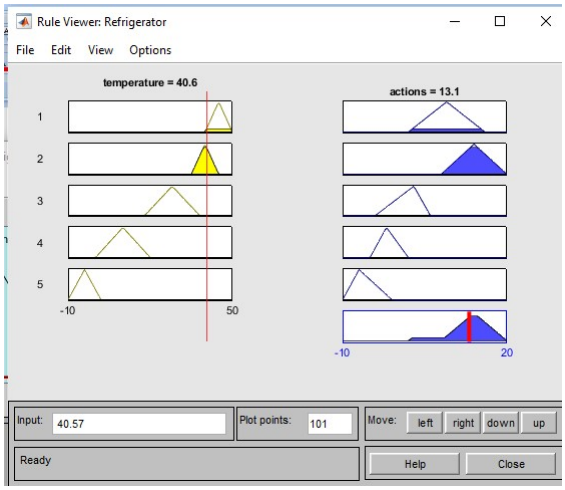
Defining the below linguistic variables for output action as coldAirIn, LittleColdAirIn, NoAirInOut, LittleHotAirIn, HotAirIn.



Defining Rules below:

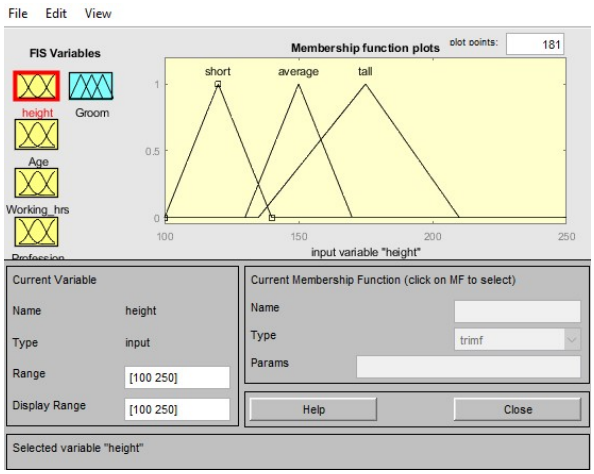


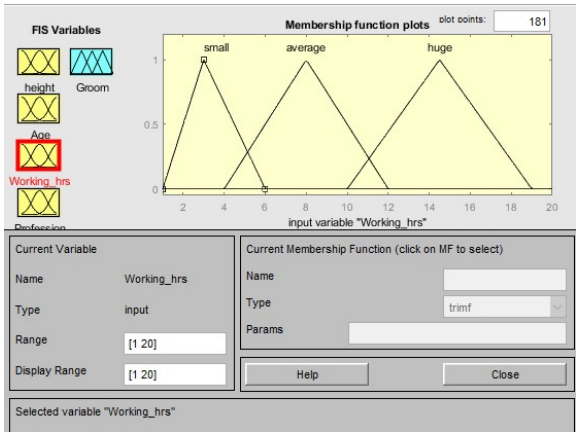
Rules Inference:

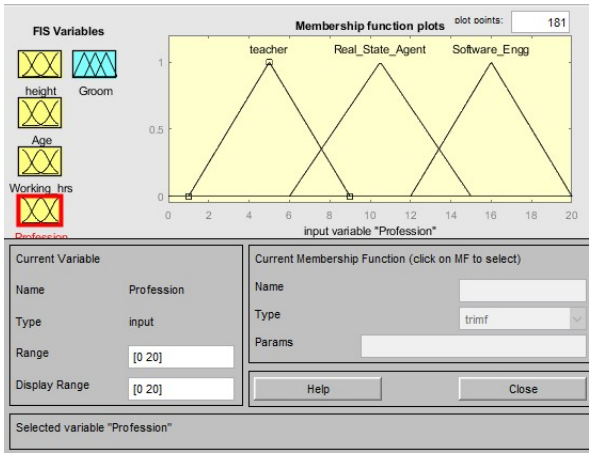


3. **Consider the inputs to the fuzzy system for selection of a Bride groom for a bride. Draw the table for fuzzy domain classification of input variables. Draw the membership function of fitness. Write the matlab code to evaluate groom and show the best grooms from input.**

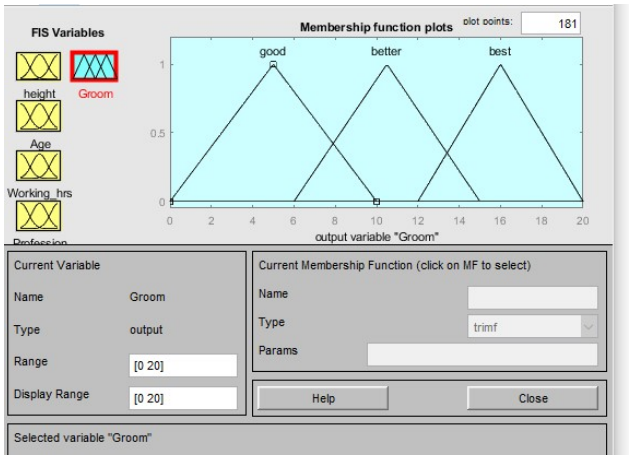
Following are the membership functions defined for the inputs such as height, age, working_hours and profession.



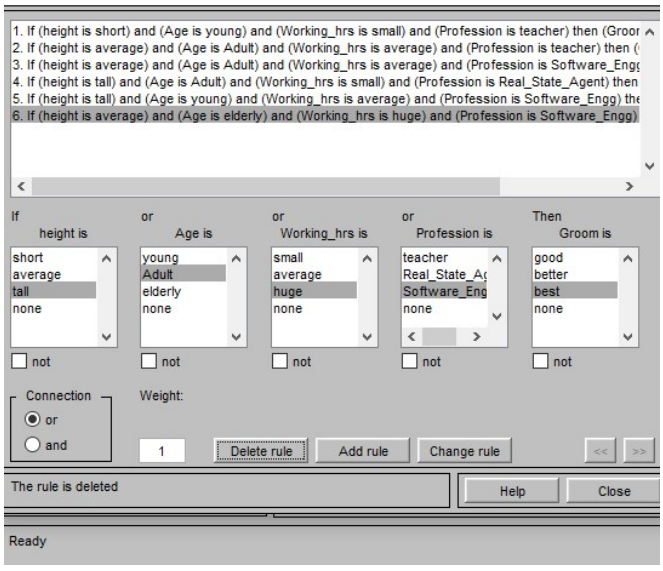




Membership function for the output Groom:



Defining Rules below:



Rules Inference or retrieval of perfect groom for bride: