PROBLEM STATEMENT:

7.c) Fuzzy Logic: Solve Car wiper controller using Python.

PREREQUISITES:

- Knowledge of Soft Computing Algorithms

Software requirements:

- 4 GB Ram
- Personal computer
- Windows 10

Hardware requirements:

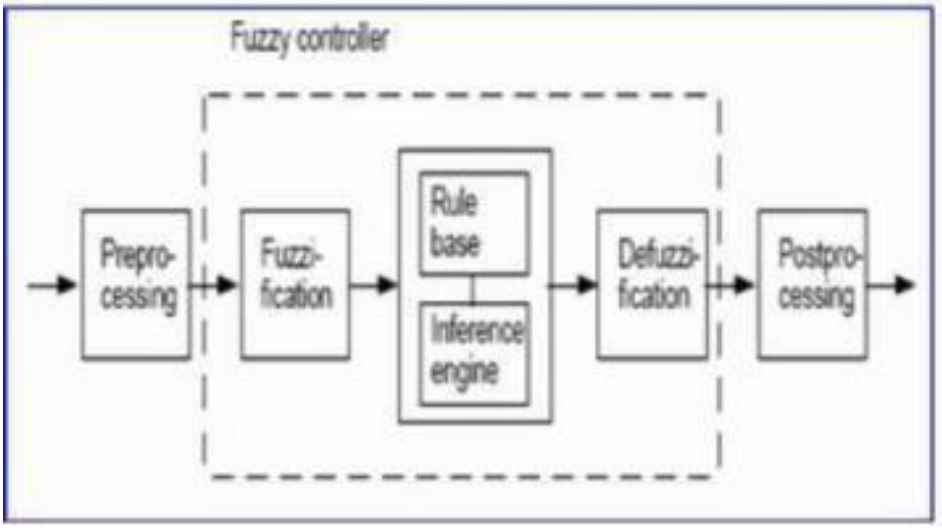
- Python
- Fuzzy

Literature Survey:

Intelligent rain sensing and fuzzy wiper control algorithm for vision based smart windshield wiper system	Design and development of smart automatic windshield wiper system: fuzzy logic approach	A Multi-objective, active fuzzy force controller in control of flexible wiper system
Windshield wipers play a key role in assuring the driver's safety during precipitation. The traditional wiper systems, however, requires driver's constant attention in adjusting the wiper speed and the intermittent wiper interval because the amount of precipitation on the windshield constantly varies according to time and	The system comprises of PIC (Peripheral Interface Controller), grid sensor and a D.C. motor to actuate the windshield wiper. Next, the grid sensor is used to detect the rain intensity which is based on the simple principle that, as wetness increases sensor output voltage decreases, when the sensor is a part of voltage divider circuit. The proposed	Chaotic vibration has been identified in the flexible automotive wiper blade at certain wiping speeds. This irregular vibration not only decreases the wiping efficiency, but also degrades the driving comfort. A reliable nonlinear system identification namely nonlinear auto regressive exogenous Elman neural network (NARXENN) was

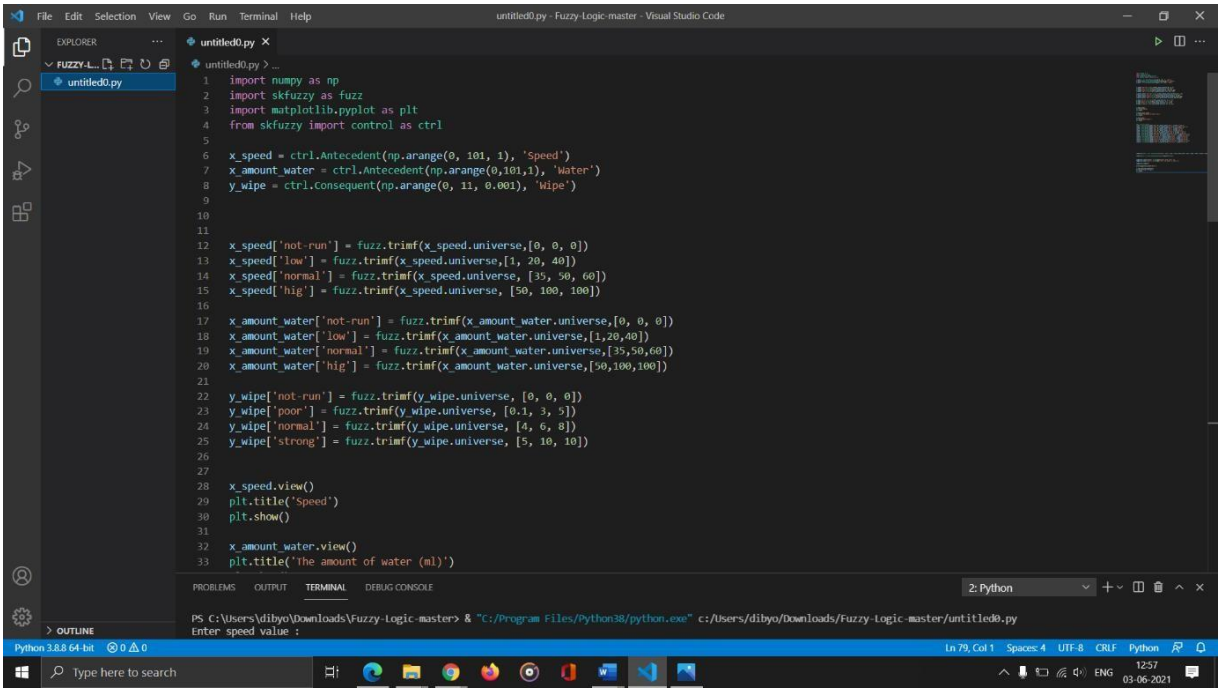
v ehicle's speed. Because the manual adjustment of the wiper distracts driver's attention, which may be a direct cause of traffic accidents, many companies have developed automatic wiper systems using some optical sensors with various levels of success. This paper presents the development of vision based smart windshield wiper system that can automatically adjust its speed and intermittent interval according to the amount of water drops on the windshield.	system has ability to change the wiper speed automatically with the change in rain intensity. But the system is not able to measure the rain intensity. Hence to tackle this problem the MATLAB 7.0 fuzzy logic toolbox is used to predict the intensity of rain (High rain, medium rain, Drizzle).	adopted in first stage of this survey to model the flexible dynamics of wiper blade with acquired experimental data. In controller design part, taking into account environmental and external disturbances that cause changes in the dynamic characteristics of the system demanded a robust controller to make a trade-off between the worst and best scenario. An active fuzzy force controller (AFLC) supervised by multi objective genetic algorithm (MOGA) is developed to keep both interests of noise and vibration redaction of automobile wiper blade at the reasonable rise time.

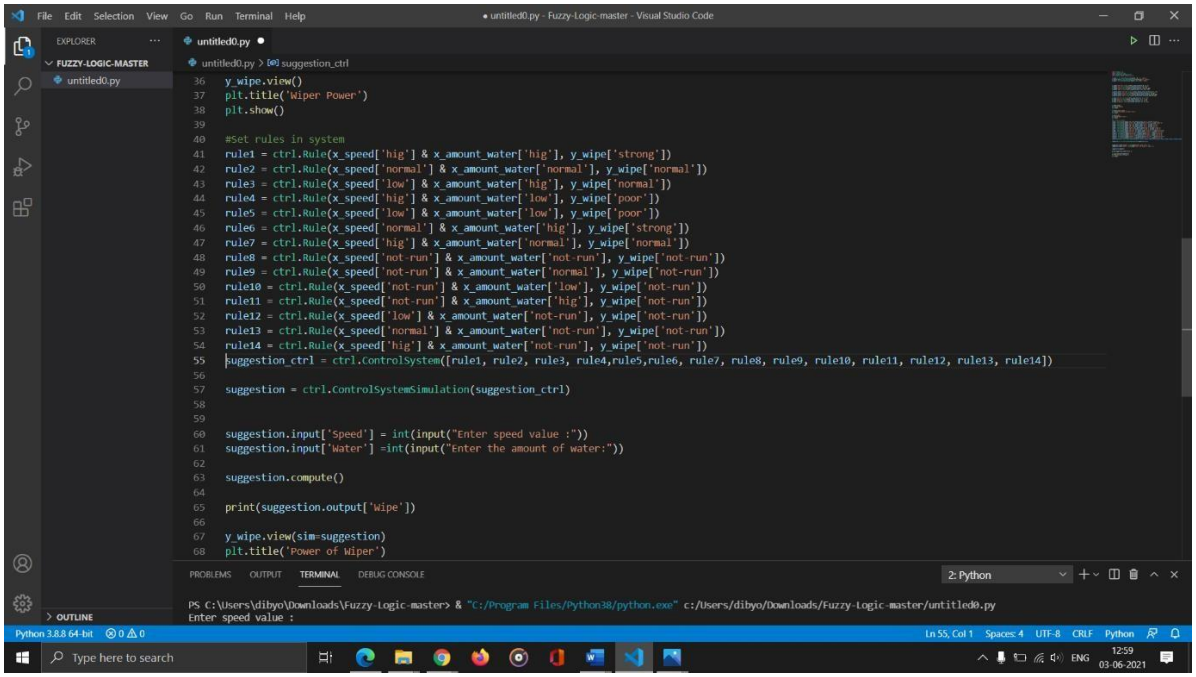
Architecture Diagram-



Screen_shots:

Code-





Graphs-

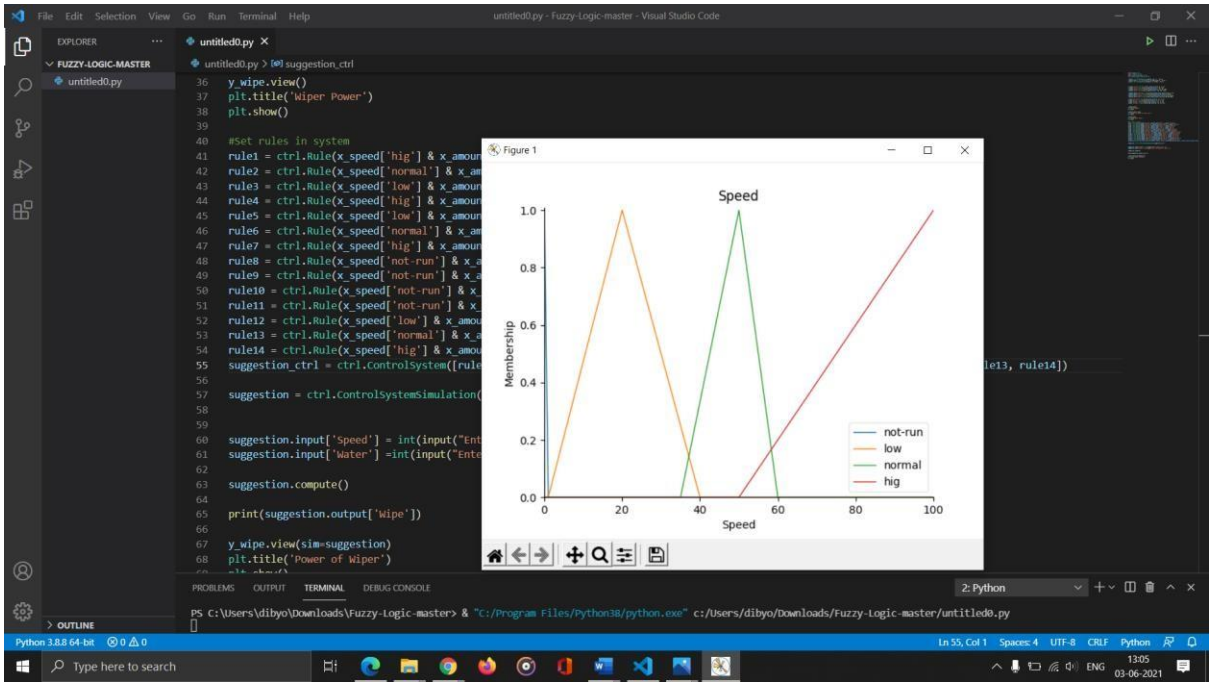


Figure 1
Speed
Membership
not-run
low
normal
hig
Speed

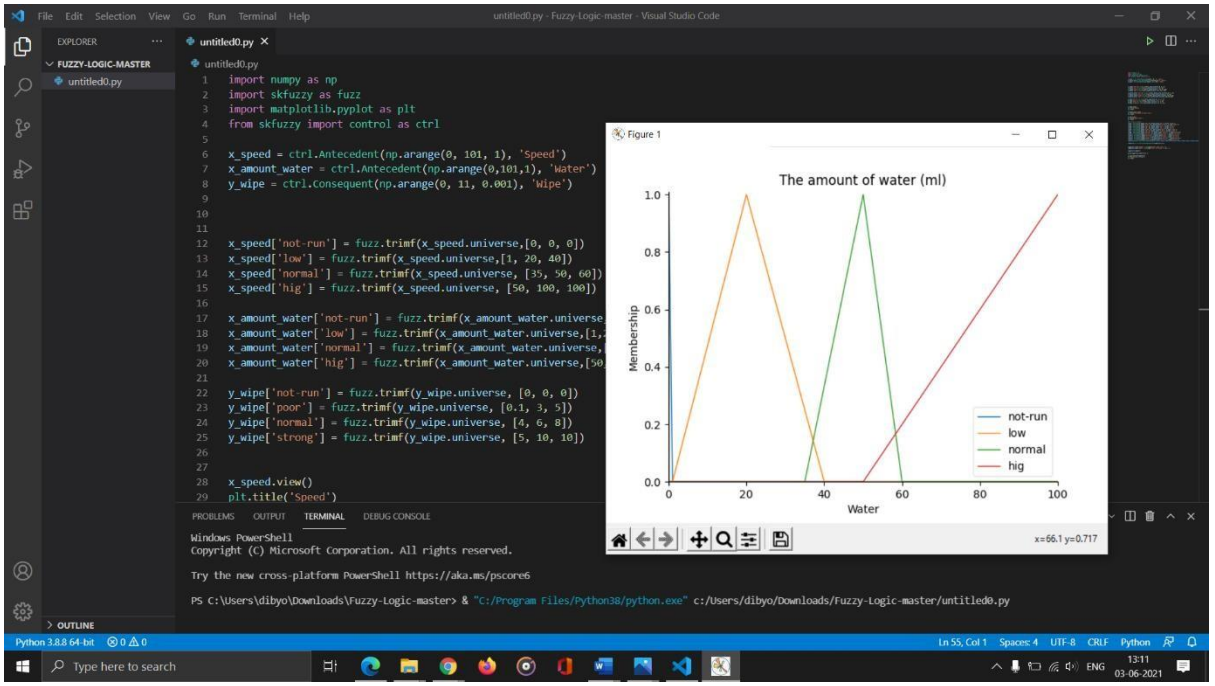
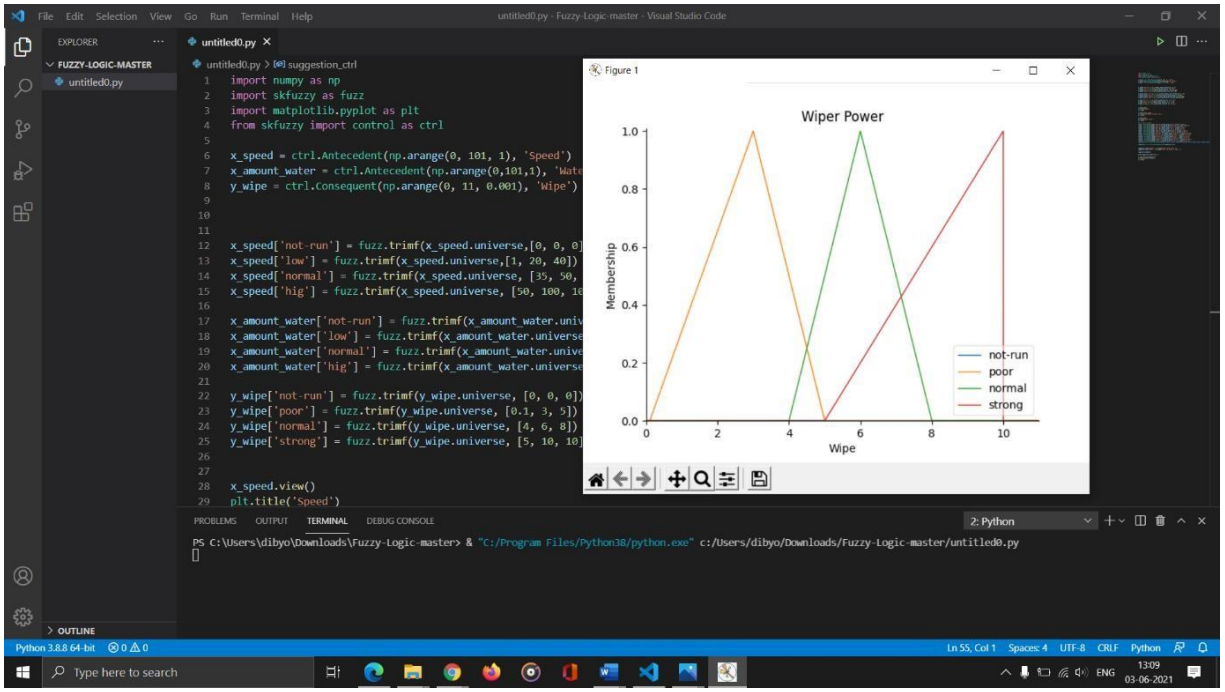
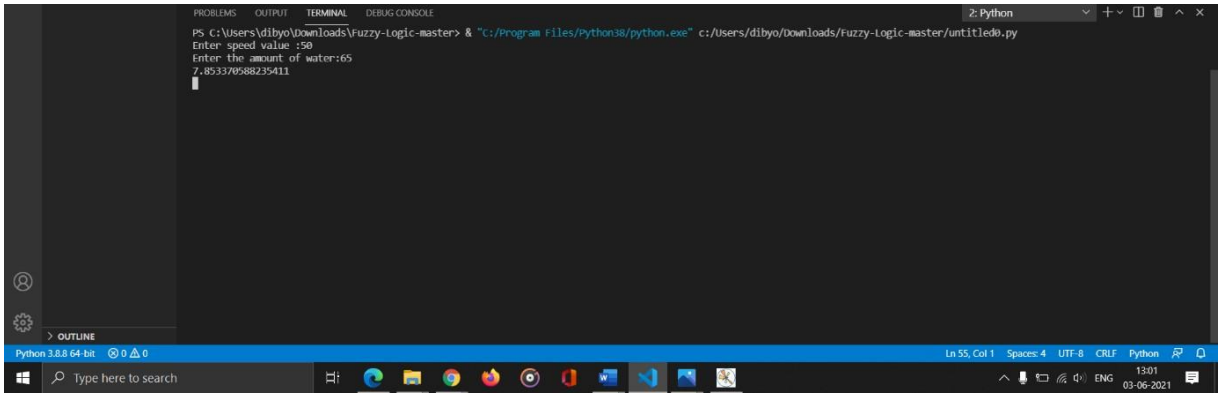


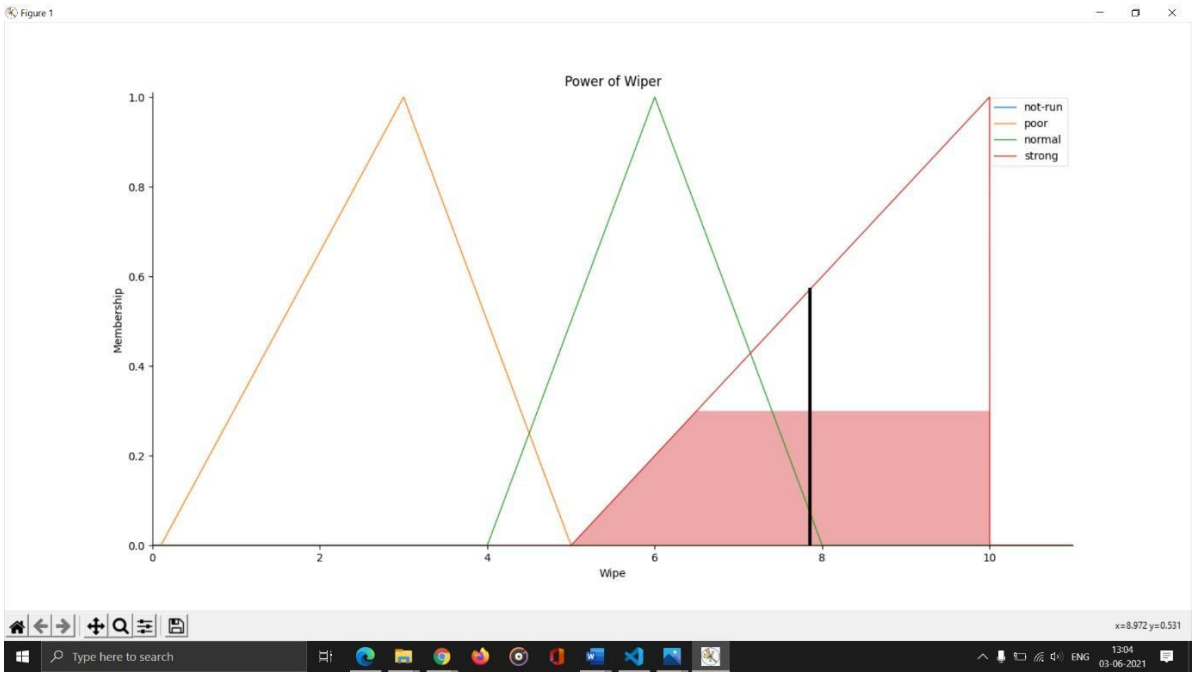
Figure 1
The amount of water (ml)
Membership
not-run
low
normal
hig
Water



Terminal-



Graph after input-



Conclusion:

We have successfully implemented the car wiper system using fuzzy logic.

References:

Development of Vision based Control Smart Windshield Wiper System for Intelligent Vehicle