

Fuzzy inference system

Name : SARANYA V

Reg No.:231801155

PROGRAM:

```
import numpy as np
import skfuzzy as fuzz
from skfuzzy import control as ctrl

# Create fuzzy variables
distance = ctrl.Antecedent(np.arange(0, 11, 1), 'distance')
speed = ctrl.Consequent(np.arange(0, 101, 1), 'speed')

# Define membership functions for distance
distance['near'] = fuzz.trimf(distance.universe, [0, 0, 5])
distance['medium'] = fuzz.trimf(distance.universe, [0, 5, 10])
distance['far'] = fuzz.trimf(distance.universe, [5, 10, 10])

# Define membership functions for speed
speed['slow'] = fuzz.trimf(speed.universe, [0, 0, 50])
speed['medium'] = fuzz.trimf(speed.universe, [0, 50, 100])
speed['fast'] = fuzz.trimf(speed.universe, [50, 100, 100])

# Define rules
rule1 = ctrl.Rule(distance['near'], speed['slow'])
rule2 = ctrl.Rule(distance['medium'], speed['medium'])
rule3 = ctrl.Rule(distance['far'], speed['fast'])

# Create the control system
speed_ctrl = ctrl.ControlSystem([rule1, rule2, rule3])
```

```
car_speed = ctrl.ControlSystemSimulation(speed_ctrl)
```

```
# Input distance and compute speed
```

```
car_speed.input['distance'] = 7
```

```
car_speed.compute()
```

```
# Print the computed speed
```

```
print("Computed speed:", car_speed.output['speed'])
```

OUTPUT:

```
Computed speed: 50.0
```