IMPLEMENTATION OF A FUZZY INFERENCE SYSTEM

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PROGRAM

```
import numpy as np

import skfuzzy as fuzz from

skfuzzy import control as ctrl


# Define fuzzy variables experience = ctrl.Antecedent(np.arange(0,

21, 1), 'experience') success_rate = ctrl.Antecedent(np.arange(0,

101, 1), 'success_rate') performance = ctrl.Consequent(np.arange(0,

101, 1), 'performance')


# Define fuzzy membership functions experience['low'] =

fuzz.trimf(experience.universe, [0, 0, 10]) experience['medium'] =

fuzz.trimf(experience.universe, [5, 10, 15]) experience['high'] =

fuzz.trimf(experience.universe, [10, 20, 20])
```

```
success_rate['low'] = fuzz.trimf(success_rate.universe, [0, 0, 50])

success_rate['medium'] = fuzz.trimf(success_rate.universe, [25, 50, 75])

success_rate['high'] = fuzz.trimf(success_rate.universe, [50, 100, 100])


performance['poor'] = fuzz.trimf(performance.universe, [0, 0, 50])

performance['average'] = fuzz.trimf(performance.universe, [25, 50, 75])

performance['excellent'] = fuzz.trimf(performance.universe, [50, 100,
100])


# Define fuzzy rules

rule1 = ctrl.Rule(experience['low'] & success_rate['low'],
performance['poor'])

rule2 = ctrl.Rule(experience['medium'] | success_rate['medium'],
performance['average'])

rule3 = ctrl.Rule(experience['high'] & success_rate['high'],
performance['excellent'])


# Create FIS control system performance_ctrl =

ctrl.ControlSystem([rule1, rule2, rule3]) performance_sim =

ctrl.ControlSystemSimulation(performance_ctrl)
```

```
# Provide input values

performance_sim.input['experience'] = 12  # Example: 12 years of experience

performance_sim.input['success_rate'] = 70  # Example: 70% success rate


# Compute fuzzy inference performance_sim.compute()


# Print the output

print(f"Predicted Performance Score: {performance_sim.output['performance']:.2f}")
```

OUTPUT