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10: IMPLEMENTATION OF A FUZZY INFERENCE SYSTEM

Program:

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

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')

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, [30,
50, 70])
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, [30,
50, 70])
performance['excellent'] = fuzz.trimf(performance.universe, [50,
100, 100])

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'])

performance_ctrl = ctrl.ControlSystem([rule1, rule2, rule3])
performance_eval =
ctrl.ControlSystemSimulation(performance_ctrl)

performance_eval.input['experience'] = 12
performance_eval.input['success_rate'] = 70


performance_eval.compute()

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

Output:

```
Enter years of experience:
20
Enter success rate (%):
85
Performance: Outstanding


** Process exited - Return Code: 0 **
Press Enter to exit terminal
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```