```python
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import numpy as np
import skfuzzy as fuzz
import matplotlib.pyplot as plt

temperature = np.arange(0, 41, 1)
fan_speed = np.arange(0, 11, 1)

temp_low = fuzz.trimf(temperature, [0, 0, 20])
temp_medium = fuzz.trimf(temperature, [10, 20, 30])
temp_high = fuzz.trimf(temperature, [20, 30, 40])

fan_low = fuzz.trimf(fan_speed, [0, 0, 5])
fan_medium = fuzz.trimf(fan_speed, [2, 5, 8])
fan_high = fuzz.trimf(fan_speed, [5, 10, 10])

plt.figure(figsize=(10, 6))

plt.subplot(2, 1, 1)
plt.plot(temperature, temp_low, label='Low')
plt.plot(temperature, temp_medium, label='Medium')
plt.plot(temperature, temp_high, label='High')
plt.title("Temperature Membership Functions")
plt.xlabel("Temperature (°C)")
plt.ylabel("Membership Degree")
plt.legend()

plt.subplot(2, 1, 2)
plt.plot(fan_speed, fan_low, label='Low')
plt.plot(fan_speed, fan_medium, label='Medium')
plt.plot(fan_speed, fan_high, label='High')
plt.title("Fan Speed Membership Functions")
plt.xlabel("Fan Speed")
plt.ylabel("Membership Degree")
plt.legend()

```

```
36
37  plt.tight_layout()
38  plt.show()
39
40  temperature_input = 28
41
42  temp_low_level = fuzz.
    interp_membership(temperature, temp_low,
    temperature_input)
43  temp_medium_level = fuzz.
    interp_membership(temperature, temp_medium,
    temperature_input)
44  temp_high_level = fuzz.
    interp_membership(temperature, temp_high,
    temperature_input)
45
46  fan_activation_low = temp_low_level
47  fan_activation_medium = temp_medium_level
48  fan_activation_high = temp_high_level
49
50  aggregated = np.fmax(fan_activation_low *
    fan_low,
51            np.fmax(fan_activation_medium *
    fan_medium,
52                    fan_activation_high * fan_high))
53
54  fan_output = fuzz.defuzz(fan_speed, aggregated,
    'centroid')
55
56  print(f"Temperature: {temperature_input} °C")
57  print(f"Fuzzified fan speed: {fan_output:.2f}")
```

```
/storage/emulated/0 $ cd Download/
/storage/emulated/0/Download $ python newfile.py
Temperature: 28 °C
Fuzzified fan speed: 7.67
/storage/emulated/0/Download $
```