

```
import numpy as np
import matplotlib.pyplot as plt
def trimf(x, a, b, c):
    return np.maximum(np.minimum((x-a)/(b-a), (c-x)/(c-b)), 0)
x = np.linspace(0, 100, 500)
A = trimf(x, 20, 30, 45)
B = trimf(x, 40, 50, 60)
```

```
age = 42
mu_A = trimf(age, 20, 30, 45)
mu_B = trimf(age, 40, 50, 60)
print("Membership in Young (A):", mu_A)
print("Membership in Middle Age (B):", mu_B)
```

```
Membership in Young (A): 0.2
Membership in Middle Age (B): 0.2
```

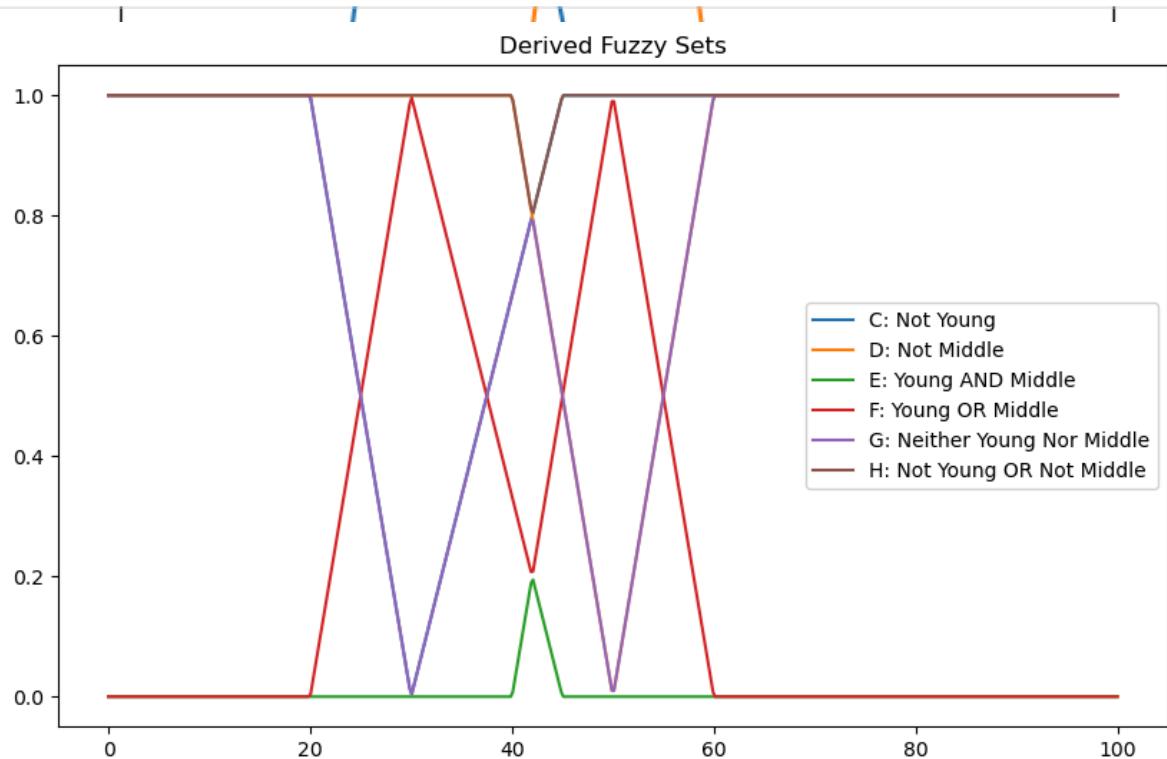
```
plt.plot(x, A, label="Young (A)")
plt.plot(x, B, label="Middle Age (B)")
plt.title("Triangular Fuzzy Sets A and B")
plt.xlabel("Age")
plt.ylabel("Membership")
plt.legend()
plt.show()
```



```

C = 1 - A
D = 1 - B
E = np.minimum(A, B)
F = np.maximum(A, B)
G = np.minimum(C, D)
H = np.maximum(C, D)
plt.figure(figsize=(10,6))
plt.plot(x, C, label="C: Not Young")
plt.plot(x, D, label="D: Not Middle")
plt.plot(x, E, label="E: Young AND Middle")
plt.plot(x, F, label="F: Young OR Middle")
plt.plot(x, G, label="G: Neither Young Nor Middle")
plt.plot(x, H, label="H: Not Young OR Not Middle")
plt.legend()
plt.title("Derived Fuzzy Sets")
plt.show()

```



```

print("C:", 1-mu_A)
print("D:", 1-mu_B)
print("E:", min(mu_A, mu_B))
print("F:", max(mu_A, mu_B))
print("G:", min(1-mu_A, 1-mu_B))
print("H:", max(1-mu_A, 1-mu_B))

```

```

C: 0.8
D: 0.8
E: 0.2
F: 0.2
G: 0.8

```



H: 0.8

```
players = ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J']
f1 = np.array([0.5, 0.7, 0.3, 0.9, 0.4, 0.6, 0.8, 0.75, 0.1, 0.2])
```

```
coaches = ['C1', 'C2', 'C3', 'C4', 'C5', 'C6', 'C7', 'C8']
f2 = np.array([0.6, 0.7, 0.7, 0.4, 0.5, 0.75, 0.3, 0.9])
```

```
s2 = np.maximum.outer(f1, f2)
```

```
s1 = np.minimum.outer(f1, f2)
```

```
p = players.index('D')
c = coaches.index('C6')
print("s1 membership:", s1[p,c])
print("s2 membership:", s2[p,c])
```

```
s1 membership: 0.75
s2 membership: 0.9
```

Start coding or [generate](#) with AI.

