Qn) fuzzy union , intersection & complement of two fuzzy sets A and B.

#fuzzy union & intersectiom of 2 sets A & B

```
import numpy as np
import matplotlib.pyplot as plt

#define the range
np.random.seed(42)   # for reproducibility
x=np.arange(100,201) #now x==A==B

#define membership values
mf_A=np.random.rand(len(x))
mf_B=np.random.rand(len(x))

#fuzzy union
fuzzy_union=np.maximum(mf_A,mf_B)

#fuzzy intersection
fuzzy_intersection=np.minimum(mf_A,mf_B)

#fuzzy complement
complement_A=np.subtract(1, mf_A)
complement_B=np.subtract(1, mf_B)

#plot
plt.figure(figsize=(12,8))
plt.plot(x,mf_A,label="Fuzzy set A",marker="o")
plt.plot(x,mf_B,label="Fuzzy set B",marker="o")
```

```
plt.plot(x,fuzzy_union,label='Fuzzy union(A U B)',marker='o')
plt.plot(x,fuzzy_intersection,label="Fuzzy intersection(A ∩ B)",marker="o")
plt.plot(x,complement_A,label="Fuzzy complement(A')",marker="x")
plt.plot(x,complement_B,label="Fuzzy complement(B')",marker="s")
plt.title("plotting fuzzy sets & their union, intersection & complements")
plt.xlabel('elements')
plt.ylabel('membership values')
plt.legend()
plt.grid(True)
plt.show()
```