AI LAB
EXPERIMENT NO: 9

ALGORITHM:-

Step 1: Start
Step 2: Each piece of evidence is represented by a separate belief function
Step 3: Combination rules are then used to successively fuse all these belief
functions in order to obtain a belief function representing all available evidence.
Step 4: Specifically, the combination (called the joint mass) is calculated from
the two sets of masses m1 and m2 in the following manner:
• $m_{1,2}(\emptyset) = 0$
• $m_{1,2}(A) = (m_1 \oplus m_2)(A) = (1/1-K) \sum_{B \cap C = A \neq \emptyset} m_1(B)\, m_2(C)$
where,
• $K = \sum_{B \cap C = \emptyset} m_1(B)\, m_2(C)$ K
K is a measure of the amount of conflict between the two mass sets.
Step 5: In python Mass-Function has the built-in combination rules.
Step 6: Stop

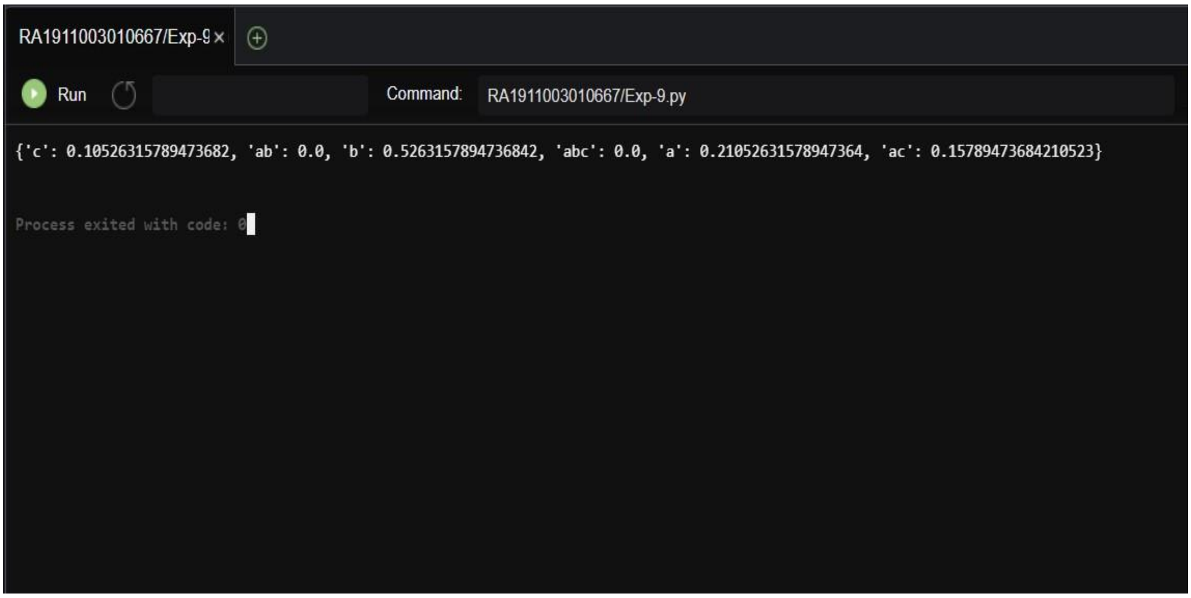
CODE:-

```
from numpy import *
def DempsterRule(m1, m2):
## extract the frame of discernment
sets=set(m1.keys()).union(set(m2.keys()))
result=dict.fromkeys(sets,0)
## Combination process
for i in m1.keys():
for j in m2.keys():
if set(str(i)).intersection(set(str(j))) == set(str(i)):
result[i]+=m1[i]*m2[j]
elif set(str(i)).intersection(set(str(j))) == set(str(j)):
result[j]+=m1[i]*m2[j]
## normalize the results
f= sum(list(result.values()))
for i in result.keys():
```

```
    result[i] /=f
    return result

m1 = {'a':0.4, 'b':0.2, 'ab':0.1, 'abc':0.3}
m2 = {'b':0.5, 'c':0.2, 'ac':0.3, 'a':0.0}
print(DempsterRule(m1, m2))
```

OUTPUT:-



RESULT:-

Hence, the Implementation of Dempster Shafer Theory is done successfully.

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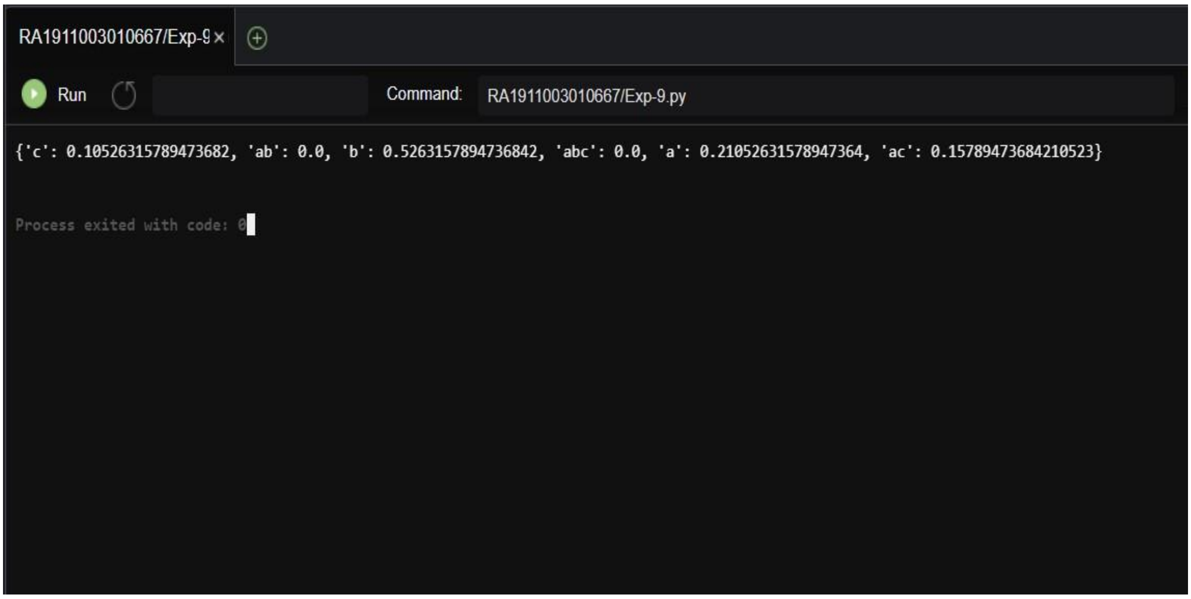

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