1. For the function Bel: $2^X \to [0,1]$ find the basic probability assignment m: $2^X \to [0,1]$ and the plausibility function Pl:$2^X \to [0,1]$ where X={0,1,2,3} and Bel({0}) = Bel({1})=0, Bel({2}) = Bel({3}) = Bel({0,2}) = Bel({0,3}) = Bel({1,2}) = Bel({1,3}) = ¼, Bel({0,1}) = Bel({2,3}) = Bel({0,2,3}) = Bel({1,2,3}) = ½, Bel({0,1,2}) = Bel({0,1,3}) = ¾.

2. For the function Bel: $2^X \to [0,1]$ find the basic probability assignment m: $2^X \to [0,1]$ and the plausibility function Pl:$2^X \to [0,1]$ where X={1,2,3} and Bel({1}) = Bel({2})=0, Bel({3}) = Bel({1,3}) = 1/2, Bel({1,2}) = 1/4, Bel({2,3}) = ¾.

3. X={x1,x2,x3,x4,x5}, and two basic probability assignments, m and n are given below:

	{x4,x5}	{x1,x3}	{x1,x2}	{x2,x4}	{x1,x2,x3}
m	3/8	3/8	1/4	0	0
n	0	0	1/4	1/4	1/2

Assuming independence of both pieces of evidence, find their orthogonal sum $m \oplus n$.

4. X={a,b,c}, and two basic probability assignments, m and n are given below:

	{a}	{b}	{c}	{a,b}	{a,c}	{b,c}	{a,b,c}
m	0.3	0	0.2	0.3	0	0.1	0.1
n	0	0	0.2	0.2	0.3	0.2	0.1

Assuming independence of both pieces of evidence, find their orthogonal sum $m \oplus n$.

5. Assume that S=(X,A,V) is an information system given below:

	A	B
x1	1	2
x2	1	1
x3		1
x4	2	
x5		2

Propose two different interpretations of attributes A, B by belief functions and by plausibility function.

6. CHASE ALGORITHM

X	E	F	G	C
x1	e1	f1	(g1,1/2)(g2,1/2)	c2
x2	e2	f1	g2	c1
x3	(e1,1/2)(e2,1/2)	f1	g1	
x4	e2	(f1,1/2)(f2,1/2)	g2	c1
x5	e1	f2	g1	c2
x6	e2	f2	(g1,1/2)(g2,1/2)	c2

Rules extraction (**ERID**) [Min Conf = 2/5, Min Sup=1]

c1*={x2,x4}, c2*={x1,x5,x6};

e1*={x1,x5}$\subseteq$ c2* , **e2***={x2,x4,x6},

e1 → c2 sup=2, conf=1;

f1*={x1,x2,(x4,1/2)} , **f2***={(x4,1/2),x5,x6}$\subseteq$ c2*

f2 → c2 sup=5/2 conf= (1+1+1/2)/3= 5/6

g1*={(x1,1/2), x5, (x6,1/2)}$\subseteq$c2*, **g2***={(x1,1/2), x2, x4, (x6,1/2)}

g1 → c2 sup=2, conf = [1/2 + 1+ ½]/3 = 2/3.

g2→c1 sup=2 conf=2/3 ; g2→c2 sup=1 conf=1/3

e2.f1*={(x2,(x4,1/2)}$\subseteq$c1* , **e2.f2***={(x4,1/2), x6}$\subseteq$c2* ,

e2.g1*={(x6,1/2)} , **e2.g2***={(x2,x4,(x6,1/2)}

e2.f1→c1 sup=1+1/2=3/2 conf=1; e2.f2→c2 sup= 1 conf=1/[3/2]=2/3

e2.g2→c1 sup=2, conf=2/[5/2]=4/5

e2.g2→c2 sup=1/2, conf=1/2[5/2]=1/5

f1.g1*={(x1,1/2)} **f1.g2***={(x1,1/2),x2,(x4,1/2)}

f2.g1*={x5,(x6,1/2)} **f2.g2***={(x4,1/2),(x6,1/2)}

f1.g2→c1 sup=3/2 conf=[3/2]/2=3/4; f1.g2→c2 sup=1/2

f2.g1→c2 sup=3/2 conf=1;

e2.f1.g2*=e2.f1* , e2.f2.g2*={(x4,1/2),(x6,1/2)}, e2.f2.g1*={(x6,1/2)}

e2.f2.g2→c1 sup=1/2 ; e2.f2.g2→c2 sup=1/2

X	E	F	G	C
x3	(e1,1/2)(e2,1/2)	f1	g1	?

Rules	Support	Confidence
e1 → c2	2	1
f2 → c2	5/2	5/6
g1 → c2	2	2/3
g2→ c1	2	2/3
e2.f1→ c1	3/2	1
e2.g2 → c1	2	4/5
f1.g2→ c1	3/2	3/4
f2.g1→ c2	3/2	1

c1: $[1/2]\cdot 1\cdot[3/2]\cdot 1 = 3/4 = 9/12 \quad \rightarrow \quad 9$

c2: $\frac{1}{2}\cdot 2\cdot 1 + 1\cdot 2\cdot[2/3] = 1 + 4/3 = 7/3 = 28/12 \quad \rightarrow \quad 28$

C(x3) = {(c1,9/37),(c2,28/37)}