	x	y	z	Minterm		Maxterm	
				term		term	
0	0	0	0	x'y'z'	m0	(x+y+z)	M0
1	0	0	1	x'y'z	m1	(x+y+z')	M1
2	0	1	0	x'yz'	m2	(x+y'+z)	M2
3	0	1	1	x'yz	m3	(x+y'+z')	M3
4	1	0	0	xy'z'	m4	(x'+y+z)	M4
5	1	0	1	xy'z	m5	(x'+y+z')	M5
6	1	1	0	xyz'	m6	(x'+y'+z)	M6
7	1	1	1	xyz	m7	(x'+y'+z')	M7

x=0 and y=0 and z=0 ⟷ x'y'z'=1
x=0 and y=0 and z=1 ⟷ x'y'z=1

x=0 and y=0 and z=0 ⟷ (x+y+z)=0
x=0 and y=0 and z=1 ⟷ (x+y+z')=0

A	B	C	D	minterm	maxterm
0	1	1	0	A'BCD'	A+B'+C'+D
1	0	1	1	AB'CD	A'+B+C'+D'

f1 = x'y'z + xy'z' + xyz = m1 + m4 +m7
In order f1 has the value of 1,
the following minterms should be included
(m1=1) or (m4=1) or (m7=1)

m0, m2, m3, m5, m6

m0 + m2+ m3 + m5+ m6 = x'y'z' + x'yz' + x'yz + xy'z +xyz' = f1'

(m0 + m2+ m3 + m5+ m6)' = (x'y'z' + x'yz' + x'yz + xy'z +xyz')' = (f1')'

De Morgan's law

f1 = (m0 + m2+ m3 + m5+ m6)' = (x'y'z' + x'yz' + x'yz + xy'z +xyz')'

f1 = (m0' m2' m3' m5' m6') = (x'y'z')' (x'yz')' (x'yz)' (xy'z)' (xyz')'

De Morgan's law

f1 = (m0' m2' m3' m5' m6') = (x+y+z) (x+y'+z) (x+y'+z') (x'+y+z') (x'+y'+z)

f1 = (m0' m2' m3' m5' m6') = (M0) (M2) (M3) (M5) (M6)

f1 = (m0' m2' m3' m5' m6') = (m0=0) ^ (m2=0) ^ (m3=0) ^ (m5=0) ^ (m6=0)
in order to f1 has the value of 1,
the following minterms should not be included
m0, m2, m3, m5, m6

f1 = (M0) (M2) (M3) (M5) (M6) = (M0=1) ^ (M2=1) ^ (M3=1) ^ (M5=1) ^ (M6=1)
in order to f1 has the value of 1,
the following maxterms should not be included
M0, M2, M3, M5, M6

Sum of Product Sum of Minterms

f1 = x'y'z + xy'z' + xyz = m1 + m4 +m7 SoP

f1 = (m0' m2' m3' m5' m6') = M0 M2 M3 M5 M6
= (x+y+z) (x+y'+z) (x+y'+z') (x'+y+z') (x'+y'+z)

Product of Sum Product of Maxterms

Ex 2.4

F = A + B'C

F = A + B'C
A = A(B + B') = AB + AB' = AB(C+C') + AB'(C+C')
= ABC + ABC' +AB'C +AB'C' = m7 + m6 + m5 + m4
B'C = (A+A')B'C = AB'C + A'B'C = m5 + m1
= m1 + m4 + m5 + m6 + m7
F(A, B, C) = Σ(1, 4, 5, 6, 7)

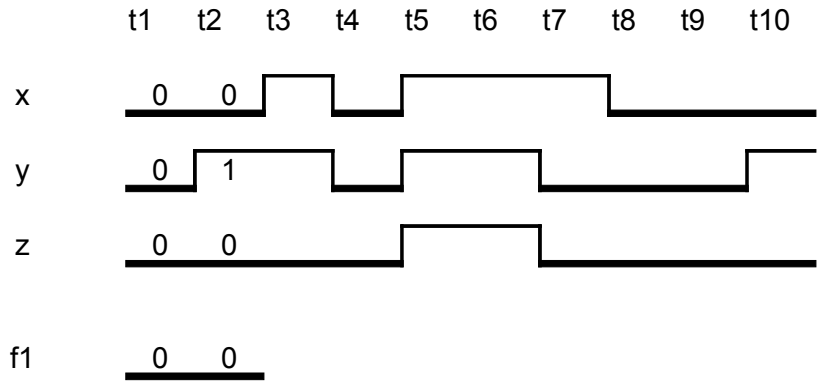
	x	y	z	term
0	0	0	0	0
1	0	0	1	1
2	0	1	0	0
3	0	1	1	0
4	1	0	0	1
5	1	0	1	0
6	1	1	0	0
7	1	1	1	1

m1 + m4 + m7 = f1
m0 + m2 + m3 + m5 + m6 = f1'

0	0	0	1	0	1	1	multiplicand
		x	0	1	0	1	multiplier
0	0	0	1	0	1	1	
0	0	0	0	0	0	0	
0	1	0	1	1	0	0	
0	0	0	0	0	0	0	
0	1	1	0	1	1	1	
	32	16			7		

0xFF	1	1	1	1	1	1	1	1
0x01	0	0	0	0	0	0	0	1
0x23	0	0	1	0	0	0	1	1
& 0x01	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	1

HW
(1) Complete the waveform of the function f1



f1 = x'y'z + xy'z' + xyz = m1 + m4 +m7

HW
(2) Read the following tutorial
http://www4.wittenberg.edu/academics/
google search: Multiplication of binary integer pdf wittenberg
What are the values stored in the variable **n** and **m?**
multiplicand, multiplier
What is the reason of shifting n and m?
Show the result of execution of the binary multiplication code.

n =	0	1	1	0	1	1	0	1
n>>1	0	0	1	1	0	1	1	0
n>>1	0	0	0	1	1	0	1	1

0xff	1	1	1	1	1	1	1	1
0x33	0	0	1	1	0	0	1	1

n =	0	1	1	0	1	1	0	1
& 0x01	0	0	0	0	0	0	0	1
	0	0	0	0	0	0	0	1