Assignment # 10.1 Key

1. **Recast the decision problem for the Boolean expression (a + b + ~c)(~a + b + b)(a + ~b + c) as a SubsetSum problem using the construction discussed in class. Indicate what rows would need to be chosen for a solution.**

	a	b	c	a + b + c	~a + ~b + ~c	a + ~b + ~c
a	1	0	0	1	0	1
~a	1	0	0	0	1	0
b	0	1	0	1	0	0
~b	0	1	0	0	1	1
c	0	0	1	1	0	0
~c	0	0	1	0	1	1
C1	0	0	0	1	0	0
C1'	0	0	0	1	0	0
C2	0	0	0	0	1	0
C2'	0	0	0	0	1	0
C3	0	0	0	0	0	1
C3'	0	0	0	0	0	1
	1	1	1	3	3	3

Assignment # 10.2 Key

2. Recast the SubsetSum problem [(17, 27, 11, 2, 7, 3, 22), G=39] as a Partition Problem using the construction discussed in class. Indicate what values would need to be chosen to equal 39. Indicate the partitions that evenly divide the Partition Problem you posed

{17, 27, 11, 2, 7, 3, 22} 17+22 = 39

{17, 27, 11, 2, 7, 3, 22, 139, 128}

Can partition as {17,22,139} = 178;
{27, 11, 2, 7, 3, 128} = 178

Assignment # 10.3 Key

3. **Recast the decision problem for the Boolean expression *(a+b+c)(~a+~b+~c)(a+~b+~c)* as a 0,1-Integer Linear Programming Problem using the construction discussed in class. Indicate what binary (0,1) values of a, b, c and d give rise to a solution to the Integer Linear Programming problem you posed.**

0≤a≤1; 0≤b≤1; 0≤c≤1

a + b + c ≥ 1

(1-a) + (1-b) + (1-c) ≥ 1

a + (1-b) + (1-c) ≥ 1

Solution: ***a = 1; b = 0; c = 0 – Lots of other solutions***