Assignment # 10.1 Key

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

	a	b	c	d	a + d + d	a + ~b + c	b + b + ~d
a	1	0	0	0	1	1	0
~a	1	0	0	0	0	0	0
b	0	1	0	0	0	0	2
~b	0	1	0	0	0	1	0
c	0	0	1	0	0	1	0
~c	0	0	1	0	0	0	0
d	0	0	1	1	2	0	0
~d	0	0	1	1	0	0	0
C1	0	0	0	1	1	0	1
C1'	0	0	0	0	1	0	0
C2	0	0	0	0	0	1	0
C2'	0	0	0	0	0	0	0
C3	0	0	0	0	0	0	1
C3'	0	0	0	0	0	0	1
	1	1	1	1	3	3	3

Assignment # 10.2 Key

2. **Recast the SubsetSum problem {14, 7, 20, 11, 4, 13, 15, 18}, G=43 as a Partition Problem using the construction discussed in class. Indicate what values would need to be chosen to equal 43. Indicate the partitions that evenly divide the Partition Problem you posed**

{14, 7, 20, 11, 4, 13, 15, 18} 14+7+4+18 = 43

{14, 7, 20, 11, 4, 13, 15, 18, 161, 145}

Can partition as {14,7,4,18,161} = 204;
{20,11,13,15,145} = 204

Assignment # 10.3 Key

3. **Recast the decision problem for the Boolean expression *(a+d)(a+~b+c+~d)(~b+~c+d)* 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; 0≤d≤1

a + d ≥ 1

a + (1-b) + c + (1-d) ≥ 1

(1-b) + (1-c) +d ≥ 1

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