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 + b	a + ~b + c
a	1	0	0	1	0	1
~a	1	0	0	0	1	0
b	0	1	0	1	2	0
~b	0	1	0	0	0	1
c	0	0	1	0	0	1
~c	0	0	1	1	0	0
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 {15, 7, 12, 4, 11, 6, 4, 12, 3, 2}, 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**

{15, 7, 12, 4, 11, 6, 4, 12, 3, 2} 15+7+12+3+2 = 39

{15, 7, 12, 4, 11, 6, 4, 12, 3, 2, 113, 115}

Can partition as {15,7,12,3,2,113} = 152;
{4,11,6,4,12,115} = 152

Assignment # 10.3 Key

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

$0 \le a \le 1;\ 0 \le b \le 1;\ 0 \le c \le 1;\ 0 \le d \le 1$

$a + b + (1-c) + d \ge 1$

$(1-a) + b + (1-d) \ge 1$

$a + (1-b) + c \ge 1$

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