Assignment # 10.1 Key

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

	p	*q*	*r*	*p + q + ~r*	*p + p + ~q*	*r + r + r*
p	*1*	*0*	*0*	*1*	*1 (or 2)*	*0*
~p	*1*	*0*	*0*	*0*	*0*	*0*
q	*0*	*1*	*0*	*1*	*0*	*0*
~q	*0*	*1*	*0*	*0*	*1*	*0*
r	*0*	*0*	*1*	*0*	*0*	*1 (or 3)*
~r	*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 if 2)*	*0*
C3	*0*	*0*	*0*	*0*	*0*	*1 (0 if 3)*
C3'	*0*	*0*	*0*	*0*	*0*	*1 (0 if 3)*
	1	*1*	*1*	*3*	*3*	*3*

Used Red Colored rows for ones chosen

Assignment # 10.2 Key

2. **Recast the SubsetSum problem {7, 17, 4, 11, 6, 2, 7}, G=36 as a Partition Problem using the construction discussed in class. Indicate what values would need to be chosen to equal 36. Indicate the partitions that evenly divide the Partition Problem you posed**

{7, 17, 4, 11, 6, 2, 7} 7+17+4+6+2 = 36

{15, 7, 12, 4, 11, 6, 4, 12, 3, 2, 72, 90}

Can partition as {7, 17, 4, 6, 2, 72} = 108;
{11, 7, 90} = 108

Assignment # 10.3 Key

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

0≤p≤1; 0≤q≤1; 0≤r≤1

p + q + (1-r) ≥ 1

p + (1-q) ≥ 1

r ≥ 1

Solution: ***p = 1; q = 1; r = 1 – Lots of other solutions***