Operations Research 2 - 2015 Question 6

Maximize p = 7x + 6y

subject to

$8x + 12y \leq 125$
$9x - 4y \leq= 45$
$y \leq 9$
$x \leq 7$
$x,y \geq 0$
x,y integers

- An IP is to be solved using the tabular Branch and Bound method.
- Use the solution grids below to solve the problem. Each node is referenced by its tree level, ordered from left to right so that the annotation **N**ode XY is the node at level **X** at position **Y** where **Y** = 1 is the left-most position in level **X**.

	Node 0		Node 1A		Node 1B
(i)	$X = 6.50, Y = 7.50$	(i)	$X = 6.00, Y = 5.00$	(i)	$X = 5.75, Y = 7.00$
(ii)	$X = 7.50, Y = 6.00$	(ii)	$X = 6.00, Y = 6.00$	(ii)	$X = 6.625, Y = 6.00$
(iii)	$X = 7.20, Y = 5.40$	(iii)	$X = 4.50, Y = 5.50$	(iii)	$X = 5.625, Y = 6.875$
(iv)	$X = 6.00, Y = 9.00$	(iv)	$X = 7.00, Y = 5.00$	(iv)	$X = 7.50, Y = 4.125$
(v)	$X = 7.00, Y = 5.75$	(v)	$X = 7.00, Y = 3.00$	(v)	$X = 7.00, Y = 5.75$
	Node 2A		Node 2B		Node 2C
(i)	$X = 6.50, Y = 4.50$	(i)	$X = 7.25, Y = 5.75$	(i)	$X = 6.00, Y = 5.00$
(ii)	$X = 6.25, Y = 5.50$	(ii)	$X = 6.25, Y = 5.50$	(ii)	$X = 6.625, Y = 5.75$
(iii)	$X = 5.625, Y = 5.00$	(iii)	$X = 7.25, Y = 5.25$	(iii)	$X = 5.625, Y = 6.75$
(iv)	$X = 7.50, Y = 4.75$	(iv)	$X = 7.00, Y = 4.00$	(iv)	$X = 6.00, Y = 6.00$
(v)	$X = 7.25, Y = 5.25$	(v)	$X = 7.50, Y = 4.50$	(v)	$X = 6.00, Y = 6.416$
	Node 2D		Node 3A		Node 3B
(i)	$X = 5.75, Y = 7.00$	(i)	$X = 6.125, Y = 2.50$	(i)	$X = 6.75, Y = 3.50$
(ii)	$X = 7.00, Y = 7.00$	(ii)	$X = 6.75, Y = 3.50$	(ii)	$X = 6.25, Y = 5.50$
(iii)	$X = 5.625, Y = 6.75$	(iii)	$X = 6.8, Y = 3.666$	(iii)	$X = 6.125, Y = 2.50$
(iv)	$X = 7.50, Y = 4.00$	(iv)	$X = 7.2, Y = 2.9$	(iv)	$X = 6.00, Y = 4.50$
(v)	$X = 7.00, Y = 6.00$	(v)	$X = 7.00, Y = 3.875$	(v)	$X = 7.00, Y = 3.875$

	Node 3C		Node 3D		Node 3E
(i)	$X = 5.75$, $Y = 6.75$	(i)	$X = 7.25$, $Y = 3.333$	(i)	$X = 6.00$, $Y = 6.00$
(ii)	$X = 5.625$, $Y = 7.333$	(ii)	$X = 4.833$, $Y = 6.5$	(ii)	$X = 6.125$, $Y = 5.75$
(iii)	$X = 7.50$, $Y = 7.125$	(iii)	$X = 3.75$, $Y = 8.666$	(iii)	$X = 6.00$, $Y = 6.75$
(iv)	$X = 7.125$, $Y = 7.00$	(iv)	$X = 5.25$, $Y = 4.33$	(iv)	$X = 5.75$, $Y = 5.00$
(v)	$X = 7.00$, $Y = 8.00$	(v)	$X = 5$, $Y = 5.50$	(v)	$X = 7.00$, $Y = 6.00$
	Node 3F		Node 3G		Node 3H
(i)	$X = 5.75$, $Y = 7.00$	(i)	$X = 5.00$, $Y = 6.00$	(i)	$X = 6.75$, $Y = 3.50$
(ii)	$X = 7.00$, $Y = 7.00$	(ii)	$X = 6.75$, $Y = 3.50$	(ii)	$X = 6.75$, $Y = 2.10$
(iii)	$X = 5.125$, $Y = 7.00$	(iii)	$X = 6.75$, $Y = 4.50$	(iii)	$X = 6.75$, $Y = 3.50$
(iv)	$X = 6.00$, $Y = 6.00$	(iv)	$X = 6.75$, $Y = 4.50$	(iv)	$X = 6.00$, $Y = 4.00$
(v)	$X = 7.25$, $Y = 5.00$	(v)	$X = 3.666$, $Y = 8.50$	(v)	$X = 7.00$, $Y = 3.50$