HW5, Ex.1, ANS4

Example 1

Show that the Poset in Figure 11-1 is a lattice.

$\sup\{0,0\} = 0$	$\sup\{0,a\} = a$	$\sup\{0,b\} = b$	$\sup\{0,1\} = 1$
$\inf\{0,0\} = 0$	$\inf\{0,a\} = 0$	$\inf\{0,b\} = 0$	$\inf\{0,1\} = 0$

$\sup\{a,a\} = a$	$\sup\{a,b\} = 1$	$\sup\{a,1\} = 1$
$\inf\{a,a\} = a$	$\inf\{a,b\} = 0$	$\inf\{a,1\} = a$

$\sup\{b,b\} = b$	$\sup\{b,1\} = 1$
$\inf\{b,b\} = b$	$\inf\{b,1\} = b$

$\sup\{1,1\} = 1$
$\inf\{1,1\} = 1$

Therefore, for all $x, y \in A$ $\sup\{x,y\}$ and $\inf\{x,y\}$exists. Therefore A is a lattice.