**Exercise 3.1-1:**

$\because We\ might\ assume\ that\ f(n) \geq g(n)$

$\therefore max(f(n), g(n)) = f(n)$

$\therefore \exists c_1 > 0,\ s.t.\ f(n) \geq c_1(f(n) + g(n))$

$\therefore max(f(n), g(n)) = \Omega(f(n) + g(n))$

$\because f(n) \leq f(n) + g(n)$

$\therefore max(f(n), g(n)) = O(f(n), g(n))$

$\therefore max(f(n), g(n)) = \Theta(f(n), g(n))$