

1.10:

pair(1,2):  $f_1(n)$  is  $O(f_2(n))$

pair(1,3): when  $n$  is odd,  $f_1(n)$  is  $\Omega(f_3(n))$   
when  $n$  is even,  $f_1(n)$  is  $O(f_3(n))$

pair(1,4): when  $n \leq 100$ ,  $f_1(n)$  is  $\Omega(f_4(n))$   
when  $n > 100$ ,  $f_1(n)$  is  $O(f_4(n))$

pair(2,3):  $f_2(n)$  is  $O(f_3(n))$

pair(2,4): when  $n \leq 100$ ,  $f_2(n)$  is  $\Omega(f_4(n))$   
when  $n > 100$ ,  $f_2(n)$  is  $O(f_4(n))$

pair(3,4): when  $n \leq 100$ ,  $f_3(n)$  is  $\Omega(f_4(n))$   
when  $n > 100$ ,  $f_3(n)$  is  $O(f_4(n))$

1.12:

(a):  $T(n) = O(1 * n * 1 * n * n) = O(n^3)$

(b):  $T(n) = O(1 * j * (n-i) * (n-1)) = O(n^2)$

(c):  $T(n) = O((i-1) * 1 * (n-i) * 1 * 1 * (n-1)) = O(n^2)$

(d):  $T(n) = T(n-i) + T(n-i)$  for all  $n > i$   
 $= T(1) + T(1) + 1$   
 $= O(1)$