First Name: Deven Last Name: Pile

Q1: Read the instructions for question Q1 in the assignment document. **In each of the 12 entries below, enter the corresponding integer**.

$n11 =$ 9	$n12 =$ 77	$n13 =$ 599	$n14 =$ 929
$n21 =$ 6	$n22 =$ 10	$n23 =$ 13	$n24 =$ 16
$n31 =$ 6	$n32 =$ 8	$n33 =$ 9	$n34 =$ 11

Q2: Read the instructions for question Q2 in the assignment document. **For each of the four sub-questions, check every box that is true**.

(a):
- ☐ $f(n) \in O(g(n))$
- ☑ $f(n) \in \Omega(g(n))$
- ☐ $f(n) \in \Theta(g(n))$

(b):
- ☑ $f(n) \in O(g(n))$
- ☐ $f(n) \in \Omega(g(n))$
- ☐ $f(n) \in \Theta(g(n))$

(c):
- ☑ $f(n) \in O(g(n))$
- ☑ $f(n) \in \Omega(g(n))$
- ☑ $f(n) \in \Theta(g(n))$

(d):
- ☑ $f(n) \in O(g(n))$
- ☑ $f(n) \in \Omega(g(n))$
- ☑ $f(n) \in \Theta(g(n))$

Q3: Read the instructions for question Q3 in the assignment document. **For each of the four sub-questions, check the only box whose corresponding array content answers the question**.

(a):

☑ $A:$	13	14	11	15	12
☐ $A:$	13	14	14	15	12
☐ $A:$	13	13	14	15	12
☐ $A:$	11	13	14	15	12
☐ $A:$	11	13	14	15	15
☐ $A:$	11	13	14	14	15
☐ $A:$	11	13	13	14	15
☐ $A:$	11	12	13	14	15

(b):

☐ $A:$	13	14	11	15	12
☐ $A:$	13	14	14	15	12
☑ $A:$	13	13	14	15	12
☐ $A:$	11	13	14	15	12
☐ $A:$	11	13	14	15	15
☐ $A:$	11	13	14	14	15
☐ $A:$	11	13	13	14	15
☐ $A:$	11	12	13	14	15

(c):

☐ $A:$	13	14	11	15	12
☐ $A:$	13	14	14	15	12
☐ $A:$	13	13	14	15	12
☑ $A:$	11	13	14	15	12
☐ $A:$	11	13	14	15	15
☐ $A:$	11	13	14	14	15
☐ $A:$	11	13	13	14	15
☐ $A:$	11	12	13	14	15

(d):

☐ $A:$	13	14	11	15	12
☐ $A:$	13	14	14	15	12
☐ $A:$	13	13	14	15	12
☐ $A:$	11	13	14	15	12
☐ $A:$	11	13	14	15	15
☑ $A:$	11	13	14	14	15
☐ $A:$	11	13	13	14	15
☐ $A:$	11	12	13	14	15

Carefully read the instruction for each question in the assignment document

Q4: Read the instructions for question Q4 in the assignment document. **For each of the two sub-questions, check every box whose corresponding values for c and N make the proof correct**.

(a):
- [x] $c = 6, N = 100$
- [x] $c = 6, N = 200$
- [x] $c = 7, N = 100$
- [ ] $c = 6, N = 50$
- [ ] $c = 5, N = 100$

(b):
- [x] $c = 4, N = 100$
- [x] $c = 4, N = 200$
- [x] $c = 3, N = 100$
- [ ] $c = 4, N = 50$
- [ ] $c = 5, N = 100$

Q5: Read the instructions for question Q5 in the assignment document. **For each of the five sub-questions, choose True or False.**

(a): True / False — If $f(n) \in O(n)$ and $g(n) \in O(n)$, then $f(n) + g(n) \in O(n)$.

(b): True / False — If $f(n) \in O(n)$ and $g(n) \in O(n^2)$, then $f(n) + g(n) \in O(n)$.

(c): False — If $f(n) \in O(n)$, then $n^2 \times f(n) \in O(n^3)$.

(d): True / False — If $f(n) \in \Theta(n \log n)$ and $g(n) \in \Theta(n \log n)$, then $f(n) \in \Theta(g(n))$.

(e): True / False — If $f(n) \in O(n^2)$ and $g(n) \in O(n^2)$, then $f(n) \in O(g(n))$.