CMPSC 465 Assignment 01

Shi Qiu

TOTAL POINTS

30 / 47

QUESTION 1

1 Problem 2 11 / 15

+ 11 Point adjustment

parts 7, 9, 13, and 15 are incorrect

QUESTION 2

Problem 3 16 pts

2.1 1 4 / 4

✓ **+ 2 pts Correct**

✓ **+ 2 pts proved using formal definition/limits**

+ 2 pts correct counterexample

+ 0.4 pts went for 10% by answering "I don't know" or something similar

+ 0 pts incorrect answer/ unanswered

2.2 2 4 / 4

✓ **+ 2 pts Correct answer**

+ 2 pts proved using formal definition/limits

✓ **+ 2 pts correct counterexample**

+ 0 pts incorrect answer/ unanswered

+ 0.4 pts writing 'I don't know'

2.3 3 2 / 4

✓ **+ 2 pts Correct**

+ 2 pts proved using formal definition/limits

+ 2 pts correct counterexample

+ 0 pts incorrect / unanswered

+ 0.4 pts writing 'I don't know'

2.4 4 2 / 4

✓ **+ 2 pts Correct**

+ 2 pts proved using formal definition/limits

+ 2 pts correct counterexample

+ 0.4 pts writing "I don't know" or something similar

+ 0 pts incorrect/ unanswered

Missing explanation

QUESTION 3

Problem 4 16 pts

3.1 1 1 / 4

+ 2 pts Correct proof or justification

+ 2 pts Correct answer

✓ **+ 0 pts Incorrect Answer**

✓ **+ 1 pts Incomplete/Incorrect explanation**

+ 0 pts No explanation

+ 0.4 pts 10% points

3.2 2 0 / 4

+ 2 pts Correct proof or justification

+ 2 pts Correct answer

✓ **+ 0 pts Incorrect Answer**

+ 1 pts Incomplete/Incorrect Explanation

+ 0 pts No explanation

+ 0.4 pts 10% points

3.3 3 4 / 4

✓ **+ 2 pts Correct proof or justification**

✓ **+ 2 pts Correct answer**

+ 2.5 pts In correct answer but with reasonable explanation

+ 0 pts No explanation / wrong answer / wrong explanation

+ 0.4 pts 10% points

+ 1 pts Incomplete/ Incorrect explanation

+ 0 pts Incorrect answer

3.4 4 2 / 4

+ 2 pts Correct proof or justification

✓ **+ 2 pts** **Correct answer**

+ 0.4 pts 10% points

+ 0 pts Incorrect answer

+ 1 pts Incorrect/Incomplete explanation

✓ **+ 0 pts** **No explanation**

Problem 2

Points:

1. $f = \Omega(g)$
2. $f = \Omega(g)$
3. $f = O(g)$
4. $f = \Omega(g)$
5. $f = \Theta(g)$
6. $f = \Omega(g)$
7. $f = \Omega(g)$
8. $f = O(g)$
9. $f = \Omega(g)$
10. $f = \Theta(g)$
11. $f = O(g)$
12. $f = \Omega(g)$
13. $f = O(g)$
14. $f = \Omega(g)$
15. $f = O(g)$

1 Problem 2 **11 / 15**

+ 11 Point adjustment

parts 7, 9, 13, and 15 are incorrect

Problem 3

Points:

1. true

if $f(n) = log(n)$, $g(n) = n^2$, $h(n) = 2^n$

then $f = O(h)$

2. false

if $f(n) = n$, $g(n) = 2n$,

then $2^{f(n)} = 2n$, while $\Theta(2^{g(n)}) = 4^n$.

3. false

4. true

2.1 1 **4 / 4**

✓ **+ 2 pts** **Correct**

✓ **+ 2 pts** **proved using formal definition/limits**

+ 2 pts correct counterexample

+ 0.4 pts went for 10% by answering "I don't know" or something similar

+ 0 pts incorrect answer/ unanswered

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Points:

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if $f(n) = log(n)$, $g(n) = n^2$, $h(n) = 2^n$

then $f = O(h)$

2. false

if $f(n) = n$, $g(n) = 2n$,

then $2^{f(n)} = 2n$, while $\Theta(2^{g(n)}) = 4^n$.

3. false

4. true

2.2 2 **4 / 4**

✓ **+ 2 pts** **Correct answer**

+ 2 pts proved using formal definition/limits

✓ **+ 2 pts** **correct counterexample**

+ 0 pts incorrect answer/ unanswered

+ 0.4 pts writing 'I don't know'

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2.3 3 **2 / 4**

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4. true

2.4 4 **2 / 4**

✓ **+ 2 pts Correct**

+ **2 pts** proved using formal definition/limits

+ **2 pts** correct counterexample

+ **0.4 pts** writing "I don't know" or something similar

+ **0 pts** incorrect/ unanswered

Missing explanation

Problem 4

Points:

1. for i: 1 to n do

it is n steps

j: = i;

$n * (n-1)/2$

and run time is $\Theta(n^2)$

2.

simmiar and still $\Theta(n^2)$

3.

another loop and be $\Theta(n^3)$

4.

maybe still $\Theta(n^2)$

3.1 1 **1 / 4**

+ **2 pts** Correct proof or justification

+ **2 pts** Correct answer

✓ **+ 0 pts** **Incorrect Answer**

✓ **+ 1 pts** **Incomplete/Incorrect explanation**

+ **0 pts** No explanation

+ **0.4 pts** 10% points

Problem 4

Points:

1. for i: 1 to n do

it is n steps

j: = i;

$n * (n-1)/2$

and run time is $\Theta(n^2)$

2.

simmiar and still $\Theta(n^2)$

3.

another loop and be $\Theta(n^3)$

4.

maybe still $\Theta(n^2)$

3.2 2 **0 / 4**

+ **2 pts** Correct proof or justification
+ **2 pts** Correct answer
✓ **+ 0 pts** **Incorrect Answer**
+ **1 pts** Incomplete/Incorrect Explanation
+ **0 pts** No explanation
+ **0.4 pts** 10% points

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Points:

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another loop and be $\Theta(n^3)$

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maybe still $\Theta(n^2)$

3.3 3 **4 / 4**

✓ **+ 2 pts** **Correct proof or justification**

✓ **+ 2 pts** **Correct answer**

+ 2.5 pts In correct answer but with reasonable explanation

+ 0 pts No explanation / wrong answer / wrong explanation

+ 0.4 pts 10% points

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+ 0 pts Incorrect answer

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Points:

1. for i: 1 to n do

it is n steps

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and run time is $\Theta(n^2)$

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simmiar and still $\Theta(n^2)$

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another loop and be $\Theta(n^3)$

4.

maybe still $\Theta(n^2)$

3.4 4 **2 / 4**

+ **2 pts** Correct proof or justification

✓ **+ 2 pts** **Correct answer**

+ **0.4 pts** 10% points

+ **0 pts** Incorrect answer

+ **1 pts** Incorrect/Incomplete explanation

✓ **+ 0 pts** **No explanation**