## **Quiz 1: Complexity Analysis and Correctness of Algorithms**

Started: Oct 19 at 9:12pm

## **Quiz Instructions**

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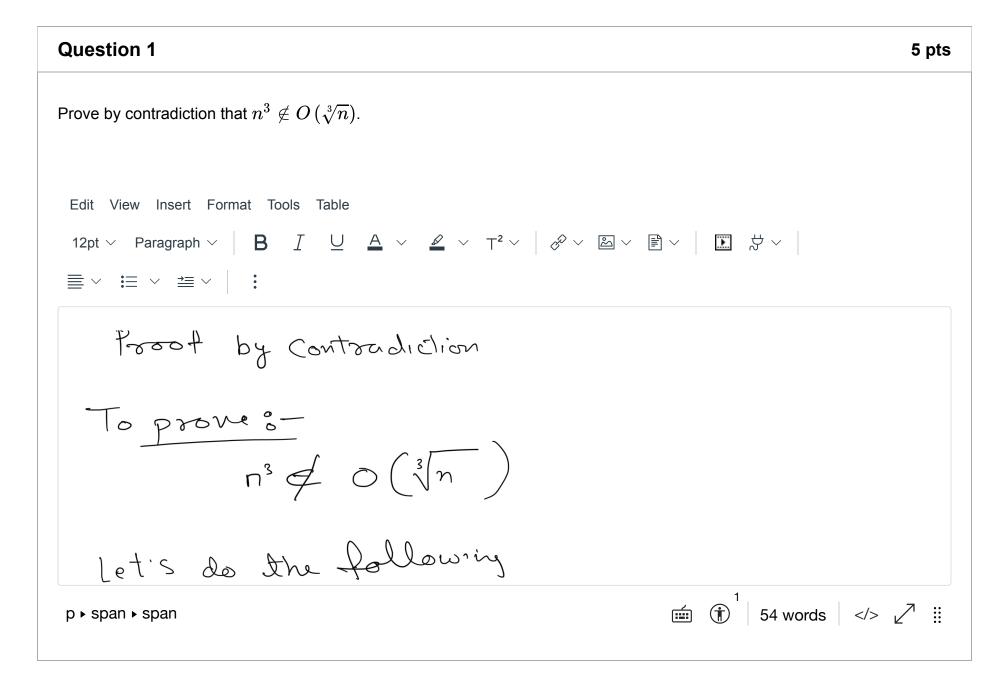
This quiz will test your understanding of the material covered in week 1.



Note that this test cannot be taken past the due date for any credit.

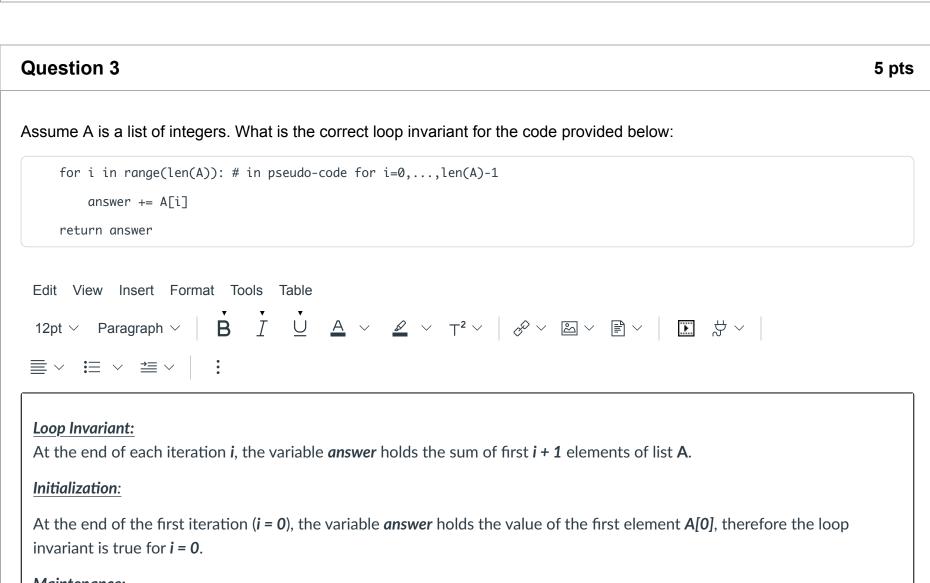
## **Grading Criteria**

This quiz is worth 30 points.





```
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for i in range(n):
       for j in range(n):
           if( i == j):
The following condition exists inside the inner loop: if(i == j):. This requirement can only be met if i and j are equal. The
condition will be true n times in total (one for each iteration of the outer loop) since i and j both run from 0 to n-1.
Inside this condition, there is another loop:
for k in range(n*n):
                                                         pre
```



Maintenance:

Assume that the loop variant is true for some arbitrary iteration k, then for iteration k + 1, the value A[k + 1] gets added to the variable answer, therefore answer holds the sum of first k + 2 (because array A is 0 indexed) elements of array A.

Therefore the loop invariant holds true for iteration k + 1

```
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```

144 words

**Question 4** 16 pts

Assume a is a list of integers. Consider the following pseudocode.

```
def mystery (a):
 temp = 5
 for i in range(len(a)):
   # Assertion 1: temp =
   if a[i] > temp:
      temp = a[i]
 # Assertion 2: temp =
```

a) (6 points) Fill in the Assertion 1 which holds in the ith iteration and Assertion 2 which holds after the For loop exits.
o) (10 points) Give an inductive proof that the Assertion 1 holds in all iterations.
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12pt $\vee$ Paragraph $\vee$ $\mid$ $\stackrel{\bullet}{\bf B}$ $\mid$ $\mid$ $\cup$ $\mid$ $\triangle$ $\mid$ $\vee$ $\mid$
Part 1:
Assertion 1:
At the start of each iteration i, `temp` holds the value max(5, a[:i]).
Assertion 2:
After the loop exits, temp = max(5, max(a))
Part 2:
p ▶ strong

No new data to save. Last checked at 9:27pm

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