

Quiz 3

The Art of Computer Programming

13 October 2025

Full name:

You have 10 minutes to answer this quiz, directly on this sheet of paper. No electronic devices or material of any kind is allowed. Do not forget to add your name above. Every question amounts to 2 points; the quiz is graded out of 10 points.

Questions

Q1. Circle the (only) correct answer regarding collections in Python:

- a. A `tuple` is mutable and dynamic.
- b. A `list` is immutable and fixed-size.
- c. A `set` is mutable and dynamic.
- d. A `dict` is immutable and dynamic.

Q2. Consider a Python list `l` of size $n \geq 100$. What is the time complexity of the following operations?

- a. `i = l[42]`
- b. `l.insert(2, 0)`

Answer:

Q3. You have an array of size n with distinct elements. Give the simplest $O(\cdot)$ notation for the worst-case time complexity of:

- a. Linear search for a given element
- b. Binary search for a given element (assuming the array is sorted)

Q4. Consider the following Python code fragment:

```
T = [2, 4, 6, 8, 10]
x = 6
for i in range(0, len(T)):
    if T[i] == x:
        pos = i
        break
```

What is the value of `pos` after execution?

Q5. What is the output of the following Python code fragment?

```
s1 = {1,2,3}
s2 = {3,2,5}
for x in s1:
    s2.add(x)
print(len(s2))
```

Answer: