

Quiz 6

The Art of Computer Programming

10 November 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 correct statement about **linked lists**:

- a. In a singly linked list, access to both first and last elements are $O(1)$.
- b. In a doubly linked list, access to both first and last elements are $O(1)$.
- c. Deletion of the first element in a singly linked list is $O(n)$.
- d. Linked lists in Python are implemented by `list`.

Q2. Circle the correct statement about **stacks and queues**:

- a. A stack follows a first-in-first-out (FIFO) policy.
- b. A doubly linked list can be used to implement both a stack and a queue.
- c. In C++, `std::stack` and `std::queue` provide random access to elements.
- d. Insertion in a queue and deletion from a queue both occur at the front of the queue.

Q3. Circle the correct statement about **hash tables and trees**:

- a. Hash tables support ordered traversal of elements.
- b. Balanced binary search trees guarantee $\Theta(n)$ search time.
- c. `std::map` in C++ is typically implemented as a balanced binary search tree.
- d. In Python, `dict` is implemented using a binary search tree.

Q4. Circle the correct statement about **multi-file programs in C/C++**:

- a. Header files (`.h`) contain the implementations of all functions.
- b. The preprocessor combines all source files into a single object file before linking.
- c. Include guards prevent a header file from being included multiple times.
- d. `#include <...>` searches local directories instead of system directories.

Q5. Circle the correct statement about **Python modules and packages**:

- a. A module is a directory containing multiple Python files.
- b. A package is a single Python file that defines several functions.
- c. The special variable `__name__` is set to `"__main__"` when a module is run directly.
- d. Importing a module with `import` copies its code into the current file.