

# Quiz 8

## The Art of Computer Programming

15 December 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 **input and output** as observable side effects:

- a. Producing output influences the internal computation of a program.
- b. Returning a value from a function communicates with the outside world.
- c. Writing to `stdout` is a side effect, not a computation.
- d. A well-designed function should both compute and print its result.

Q2. Circle the correct statement about **standard streams**:

- a. `stdin`, `stdout`, and `stderr` always refer to files on disk.
- b. `stderr` is typically used for normal program output.
- c. Standard streams cannot be redirected independently.
- d. By convention, file descriptor 0 corresponds to standard input.

Q3. **Buffering and flushing (C)**. Consider the following program, executed in a terminal:

```
#include <stdio.h>
#include <unistd.h>
int main(void) {
    printf("Hello");
    sleep(5);          // Sleep 5 seconds
    return 0;
}
```

Which of the following statements is correct?

- a. Hello is guaranteed to appear immediately on the screen after the call to `printf`.
- b. Hello may appear only after the program terminates.
- c. The program does not compile.
- d. The output is written to `stderr`.

**Q4. Line-oriented vs token-oriented input.** Give one practical advantage of reading input *line by line* and then parsing it, compared to directly using token-oriented input (such as with `scanf` or `std::cin >>`).

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**Q5. Resource management.** Write below a short code fragment (in **either C++ or Python**) that:

- opens a file named "data.txt" for reading;
- reads one line;
- guarantees that the file is closed automatically when it is no longer needed, without explicitly calling a function to close the file.