Islamic University of Technology
Department of Computer Science and Engineering

General Lab Instructions

CSE 4404: Algorithms Lab
Summer 2023-24

Contents

Welcome to the Algorithms Lab. This course is designed to build a deep understanding of fundamental algorithmic techniques and strengthen your problem-solving skills. Please read the following instructions carefully and refer back to them throughout the semester.

Course Structure

The lab course consists of:

- 12 Lab Sessions
- 2 Lab Tests

Each lab session builds upon topics taught in theory classes. You will solve algorithmic problems hands-on to reinforce your learning.

Lab Sessions

In each lab session, you will typically be assigned 2–3 tasks to solve. During the lab, you need to:

- Log in to Google Classroom.
- Check for the assignment and download any required files (if provided there).
- Access the task files by cloning or pulling from the GitHub repository.
- Create `.cpp` files in the appropriate folder for each task *following the correct naming format.*
- Write your solutions in `C++`, following good coding practices.
- Use the `localjudge` script provided to test your code and verify correctness.
- Call the instructor for a **viva** to explain your solution.
- Finally, submit your `.cpp` files through the corresponding Google Classroom assignment.

During labs, you are allowed to discuss with your friends, ask the instructor for help and *for justifiable reasons*, use the internet *(with prior approval from the instructor)*. These labs are designed to mainly help you learn, not to prove your worth. So ask for help as needed. *We want these labs to be fun, rewarding and instructional, not frustrating and demoralizing.* We are here to help, but we will not know when or how to help unless you ask. So the choice is yours.

These provisions are designed to help you learn in a comfortable and effective environment. However, we encourage you not to use them as an excuse for procrastination. Algorithms are a fundamental aspect of Computer Science, and we strongly urge you to approach this course with dedication and seriousness.

Evaluation Policy

Your performance in regular lab sessions will be evaluated through three main components: task completion, viva on the task, and viva on related concepts.

Task completion refers to how well you solve the assigned problems. Your marks in this part will be adjusted based on how clearly you can explain your solution during the task viva. So make sure you clearly understand what you're doing.

The concept viva, on the other hand, is separate and will focus on your understanding of theoretical ideas and your ability to explain solutions to practice problems.

While we will try our best to take as many vivas as possible during each lab session, it may not always be possible to take everyone's viva on the same day. In such cases, during your next viva, you will be evaluated on both the current session's tasks and any previous pending ones.

Evaluation Criteria

You will be evaluated based on your ability to:

- Explain the logic and approach clearly.
- Convince the instructor you can repeat the task independently.

If you cannot complete the task during lab hours, you may finish it later and request a **viva re-take**.

Late Submission Policy

If a student misses a lab or is unable to complete all tasks during the scheduled lab time, he is allowed to complete the lab task later at their convenience. However, to receive marks, they must explain their solution to the course instructor before submitting it. In the case of a missed lab, the student **will not receive attendance**, but will still be eligible to earn marks for the task submission. The marking policy is summarized below:

Submission Delay	**Students who missed lab**	**Students who couldn't complete task during lab time**
1 Week	70%	80%
2 Weeks	50%	60%
3 Weeks or more	0%	0%

Table 1: Late submission marking policy

Practice Problems

Each lab includes **3–7 practice problems**.

- Submission is not required.
- Online judge links will be provided.

- You may be questioned about these in future vivas.

Early Submission & Bonus

If you complete your tasks before the scheduled time, you may call the instructor for a viva. This allows you to complete your viva for that session immediately, so you won't have to appear later for multiple sessions at once. Once your viva is done, you are technically free to leave. However, we strongly encourage you to stay and help your classmates.

In a lab session, you can earn up to 50% bonus marks for meaningful contributions, such as sharing interesting observations, helping others understand concepts, writing editorials for the tasks, identifying mistakes in the test data, or even 'hacking' your friends' solutions by designing test cases that reveal hidden bugs.

These bonuses are intended to promote collaboration, deeper understanding, and a proactive learning environment.

Note: Hacking a friend's solution will not reduce his mark.

Lab Tests

There will be **2 lab tests** throughout the course. These tests will feature slightly more challenging problems and are an important part of your evaluation.

- You must solve the problems **individually**.
- **Internet access is not allowed** during the tests.
- **Viva is mandatory** for all submitted tasks.
- You are allowed to use your own **written notes**, but you cannot share them with others.
- All tests must be completed on the **lab PCs**.

Lab tests will account for **50%** of your total grade in this course.

Programming Language

Although Algorithms is a language independent course, we will be using the language `C++` for this lab. To use another language, you need to inform the instructor so that he checks your task manually (unless the `localjudge` is updated).

Lab Hardware

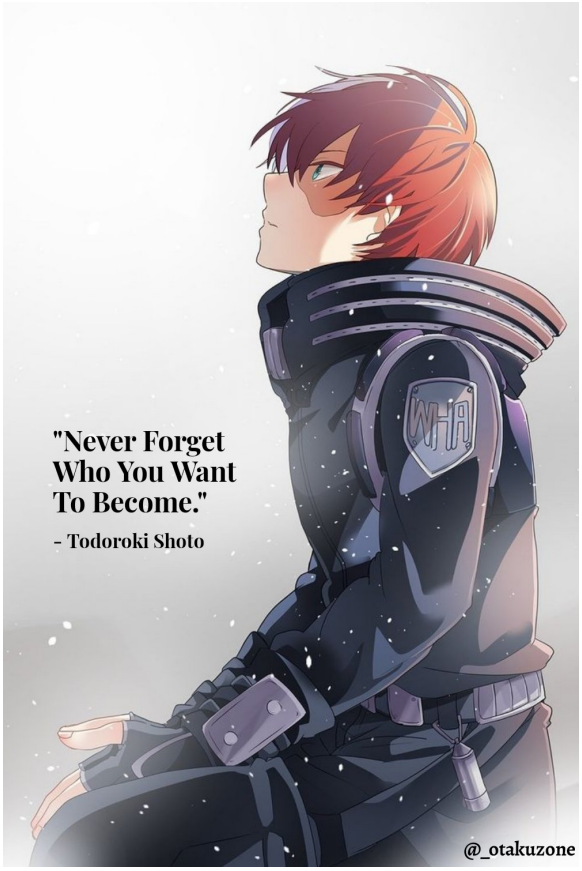
For this lab, a Linux environment is required. While you are permitted to use your personal laptop, we strongly encourage you to use the lab PCs. Familiarizing yourself with these PCs is beneficial, as you will be taking your lab tests on them. Additionally, using the lab PCs will enable us to more easily identify and address any faults before the lab tests.

Academic Integrity

We will be checking your code for logical redundancy. If you copy someone else's work and make minor changes, we will be able to tell.

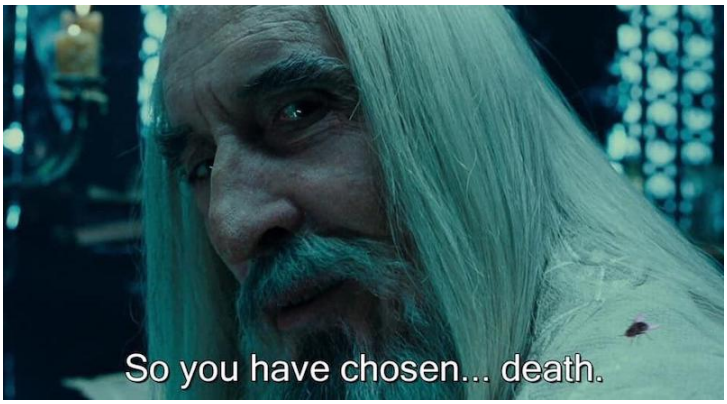
Most of you are investing a significant amount of money to be here. If you cannot learn anything, then all that is going to waste. This is your time to learn, and we are here to support you every step of the way. You don't want your future self to curse you.

Remember that *you came here to learn, not to buy a certificate.*



We trust that you'll do your own work honestly. So, please *don't let us down.* If you do, we will pursue the strongest consequences available to us.

Penalty for Dishonesty

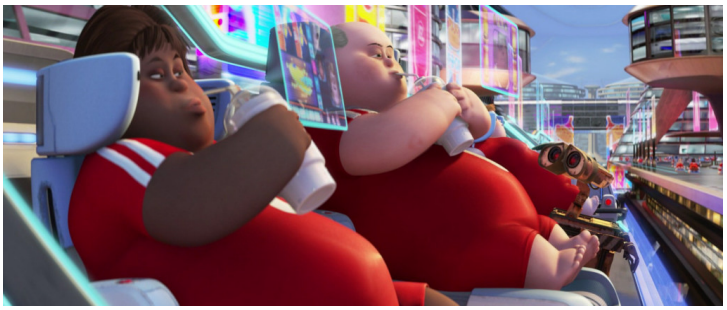


If it is proven that you have copied code from any source or are totally unable to explain it, there will be strict consequences. The minimum penalties are as follows:

- **First Offense:** You will be required to sign a written statement acknowledging that you have cheated and promising not to repeat the behavior. Your guardian will be informed of the incident. Additionally, all of your lab marks up to that point will be reset to zero.
- **Second Offense:** You will receive an **F grade** in the course.

AI Usage Policy

Artificial Intelligence (AI) is becoming a powerful tool in education, but it's important to use it wisely. University is the time for you to learn, practice, and develop your thinking skills. One of the worst things you can do as a student is let AI do the thinking for you. You don't want to be dependent on AI.



That's why in this course, using AI during lab sessions is strongly discouraged, and it is strictly not allowed during any kind of test. Even while practicing at home, it's best to first try solving the problems by yourself. This helps you truly understand what you're doing.

Still, AI can be helpful if used in the right way. At home, you can use it to clear up confusion, break down hard topics, or give you relatable examples that make things easier to understand. You can also explain your ideas to AI to check your understanding. But what you should never do is copy AI's solution without understanding it. Even when reading someone else's code or answer, try to think ahead—what should come next and why?

Remember, AI is not your substitute. It's just a tool to help you learn better. Don't let it take away the thinking part—that's the most valuable part of learning.

The Right Mindset

- **Curiosity-Driven, Not Shortcut-Seeking:** Learn because you're curious to know how things work, not just to finish quickly or get marks. Ask questions, explore ideas, and enjoy the process of discovery.
- **Active Learner, Not Passive Consumer:** Don't just read or watch—try things out yourself. Write code, make mistakes, fix them, and learn from the process. Learning is something you do, not something that just happens to you.
- **Process-Oriented, Not Result-Oriented:** Focus on improving your understanding and skills, rather than just getting the right answer or a good grade. When you focus on the process, good results will follow naturally.

> Marks often come as a side-effect of learning, but learning is never a side-effect of chasing marks.
>
> Some funny guy named *Irfanur Rahman Rafio*

- **Fail-Forward Mindset:** It's okay to make mistakes. In fact, mistakes are one of the best ways to learn. Don't get discouraged—treat each failure as a step forward, not backward.
- **Ownership of Your Learning:** Take responsibility for your own growth. Don't wait for others to teach you everything. Be proactive—ask questions, seek help when needed, and keep learning beyond what's taught in class.

Marks Distribution

Your performance in the lab course will be evaluated based on the following components:

Segment	**Marks**
Attendance	25
Task	20
Concept	5
Lab Tests	50
Total	**100**