CSLR31 Data Structures Laboratory - Project Assignment

Due: **11:59 pm, 25 October 2025** Negotiable. Focus must be on learning and discovering new stuff. Enjoy!

Objective: The objective of this project is to learn and implement concepts in Data Structures by realizing them in real world problems to develop a product/software. *If you work sincerely on this project, you'll not only gain valuable experience, but you can also proudly showcase it on your resume as a strong addition*. Towards this end, we will learn Data Structures, Programming, documentation, Team building skills and Interpersonal Skills.

General Instructions:
This assignment can be done in a **team of max. three** (you choose your group member). Solo not encouraged.

How to form Groups: As per two different criteria types, mentioned below.
Necessary:
1. In a team, have at max. one female student.
2. In a team, have at least one from a different state (as per your Institute Id Card).

Preferred:
1. Inclusion of slow learners in the team. [Improves Interpersonal skills of everyone in the team]
2. No two members in the team have their mother tongue unique. [Improves communication skills]

Mark Split-up:
I encourage team participation, as it will make you feel working in an organizational environment.
Project contributes **50 marks** – (Technical Contribution - 35 + Oral viva at two reviews - 10 + Attitude - 5).
Weightage to your final mark – **15%**.

Technical Contribution Split-up (35 marks):

Idea & Novelty	Code (Technicality, Indentation, Comments, placement of files including readme file)	Documentation	Project experience video
7	20	5	3

This project is system based and
- must be developed using C++/Java/C language.
- must be documented (coding, directory Maintenance etc.)

Search in google 'how to write a clean code', '10 tips to write a clean code' - this shall help you to produce a quality code.
Read the software documentation of 'notepad', 'xfig', 'dia', 'Overleaf'. Project report should be written in LaTeX.
As always, please feel free to approach me in person in office hours or by emails, if you have any questions. I'd be happy to help out.

Marking Criteria: Your submission will be marked using the following criteria.
- Showing good efforts through completed tasks.
- Showing attention to details through a good quality project report and individual review performance.
- *Attitude Criteria*: The behavior you show in my lecture hours, with your team members and in discussions.

Copying others' contents/downloading code from the web to show as one's one contribution will be seriously viewed, which will lead to heavy penalties for both the donor and the recipient. Anything referred from an external source should be properly cited. I encourage you, not to rush at the last moment.

Tasks

Step 1 Problem Identification

Identify a suitable problem of your choice **pertaining** to social concern/cause, issues which NITT faces, issues of global concerns, educational concerns etc. for the development of your project aligned with UNESCO and Sustainable Development Goals, given in the link. https://www.unesco.org/en/sdgs

Outcome: An abstract mentioning the title, team name, team members, 15-20 lines description of the problem statement identified which includes motivation, existing products, objectives, salient features of your idea and future scope.
Document: A one page pdf file generated through LaTeX overleaf. Please visit: https://www.overleaf.com/

Step 2 Design of the product

Draw a flow chart in 'dia/xfig' tool which can be imported to your overleaf at a later stage. Explain the working of the modules in your flow diagram in 2-3 pages which contains the idea, working of the product, the way in which it is implemented.

Step 3 Coding

In typical software development, a modular programming approach is practiced. If a product requires 5 modules, the team will prepare a .h file for each module and make it available for each module team. Suppose team M1 wants to use some subroutine of M2, this can be easily achieved through .h files as it contains the name of the function along with necessary arguments. You must separate function declaration and definition. Use header files (.h file) for declaration and (.cpp/.java/.c) file for definition. i.e., apart from standard header files, there should be XXX.h files which will have functions. The definition for such functions must be included in YYY.cpp/YYY.java/.c.

Your code should have proper indentation and comments, else the code will not be reviewed. A sample piece of code shall be placed.

Tip: Use debugging tool like 'gdb'-many run time errors can be fixed using gdb..Features like..you can peep into the contents of stack..etc.

Step 4 Testing

Contains Test cases and Test Data for your functionalities.

Step 5 Contributions, Key Takeaways, Future Scope, Acknowledgements and References

Mention clearly the individual efforts done by each person in the team. I mean, who has worked on what and so on. Be candid in mentioning your contribution. Exaggeration of efforts will lead to penalties. As a team, mention a few key takeaways (5 bullet points) on the technical contributions of this project. List out all the references which were helpful.
All the videos of the members of the team should be merged into a single .mp4 file.

Step 6 Creation of User Manual

A sample User manual can be referred over the web.
A one-page user documentation (user manual-read me file) - how to use the product... will help you to get an idea.

Step 7 Project Experience Video - A clear video where you may opt some natural scenery spots at our campus as a background for shooting.

Create a 5 minutes video of your experience in this project - what you have learned, skills you have built, what could have been better and suggestions. Briefly mention the people whom you would like to show your gratitude to.

Other Logistics:

This is to be completed and submitted to Moodle. By the due date, submit one zip file containing:

- Project report in LaTeX as a single document with contents from Step 1 to 5.
- User Documentation (user manual-read me file) - how to use the product - result of step 6.
- Project Experience Video – result of step 7.
- Include any other reference materials you have used in the development of the product.

Use directory structure. i.e., the name of the main directory is << *Team Name_Reg.No#1_Reg.No#2_ Reg.No#3_CSLR31_Project.zip*>> and it should have subdirectories such as

1. Docs (for user manual)
2. Source (all .cpp/java files), object (all .o files), include (all .h files). Makefile and a.out must be in parent directory.
3. Video.

What next?

Venue - 303, CSE dept.	**Time** - 9 am – 6 pm	**Duration**		
Review Name	**Date**	**Demo**	**Q&A for each**	**Total (in min.)**
Mid Sem Review (MSR)	30 Aug, 2025	5	5	(5* 3 = 15) + 5 = 20
End Sem Review (ESR)	27 & 28 Oct, 2025	10	5	(5*3 = 15) + 10 = 25

In review:

- I shall float the timings for the review for each team, by picking the teams in a random way.
- You show a demo of your product along with the test cases. You will be evaluated for your efforts individually.
- As a member of the team, you need to understand the entire details of the product including the implementation. You will be evaluated for your knowledge on the fundamental concepts in the course and how you have applied it in the development of the product.

Best of Wishes!

END OF ASSIGNMENT