"Programming in C with Data Structure perspective" Crash Course Report

Overview

The Crash Course on "Programming in C with Data Structures" was designed for building C programming skills amongst the B.E. Computer Science & Engineering undergraduates in the Computer Science & Engineering Department especially for Lateral Entry students. The entire course structure primarily focuses on the C programming language from the basics. The classes were held from 21st of November 2022 to 9th of December 2022.

The Team

1. Nandakishor V – B.E. CSE
2. Nitheesh Kumar N – B.E. CSE
3. Dr. S.V. Jansi Rani – Associate Professor
4. Dr. T.T. Mirnalinee – Professor & Head of Department

The Course

The crash course syllabus was planned in such a way that the students can gain every basic aspect that they need to know about the C programming language so that they can implement all the data structures without any difficulties. The classes were divided into 13 sessions covering different topics in each session. At each session students were taught and given hands-on experience to implement all the programs in the class. The sessions planned were interactive with continuous QA sessions with the students. At the end of each session, the students were also given homework problems to work on after the class.

The homework given was also designed in such a way that it covered the topics that were covered till that respective session. The homework given had to be submitted by the students in the provided link for evaluation before 2 p.m. of the next day. Every session started with the discussion on the homework problems given and the solution to them. The solution to problems submitted by the student was evaluated and the mistakes were discussed with each student then and there individually in the next class.

Students were continually guided on how to move on to a solution after reading a problem statement. This helped them to think and implement a solution to any given problem. Hence making it easier for them to implement a data structure given its characteristics. Students were tested on their understanding of the concepts with a small test at the end of the course. The solution to the test problems was also discussed in class.

At the very end of the course, the last session was exclusively spent with the students introducing them to all the data structures and demonstrating them with implementations of basic data structures such as doubly linked list, stack, and queue. The classes were closed after having a revision of all the concepts covered during the entire course.

Student Feedback

"I'm Nandini Sree R R (2nd year LE student – CSE 'B'). I'm writing this email to you in expression of my sincere gratitude towards the organisation of special C – programming basics classes for the LE students of 2021–25 batch. I had no programming experience before, but was thrilled to participate in hackathons after learning to code. One of my classmates and I participated in the WOMEN 'N' CODE Hackerrank contest that was held on the 10th December 2022. I could solve half the problems comfortably but confidently using the concepts that we were taught in the special classes. The problem I solved taking 20 minutes was to write a program that gives output for an input integer as the largest number of consecutive '1's in its binary conversion. This gave me motivation and also confidence to compete with my class students without letting the academic lag demotivate. I sincerely thank you for your kind efforts for having brought for us this crash course."

Course Outcomes

1. Implement, compile, debug, and execute procedural programs in C.
2. Implement C programs with appropriate data representation and programming constructs.
3. Organize programs into functions and modules.
4. Develop programming projects in C modularly and refine incrementally.
5. Write clean and well documented code.
6. Prepare for advanced coursework that employs C programming at its base.
7. Understand and implement data structures in C.