C++ Programming Tasks & Instructions — CodeAlpha

🖥️ C++ Programming — Internship Overview

This internship program offers hands-on experience in **C++ programming** and software development. CodeAlpha is a leading software development company committed to innovation, performance, and scalable solutions. The internship empowers students to master core **C++ concepts**, develop efficient algorithms and build high-performance applications. Interns will gain practical skills in memory management, object-oriented programming and debugging with expert mentorship and opportunities to contribute to real-world projects in a collaborative environment.

🎁 Internship Perks

- Internship Offer Letter
- Completion Certificate (QR Verified)
- Unique ID Certificate
- Letter of Recommendation (based on performance)
- Job Opportunities / Placement Support
- Resume Building Support

📌 Instructions for Interns

1. Share your internship status on **LinkedIn**, tagging **@CodeAlpha**.
2. Complete the **assigned projects** within the mentioned time frame.
3. Upload your complete source code to **GitHub** in a repository named:
   `CodeAlpha_ProjectName`
4. Post a **video explanation** of your project on LinkedIn with GitHub repo link.
5. Submit your completed task using the **Submission Form**.
6. **Complete any 3 or 2 out of the 4 tasks** listed below (from your domain).

📱 C++ Programming Task List

(Complete any 2 or 3 of the following tasks)

✅ TASK 1: CGPA Calculator

- Take input for the number of courses taken by the student.
- For each course, input the grade and the credit hours.
- Calculate the total credits and total grade points (grade × credit hours).
- Compute the GPA for the semester and then the overall CGPA.
- Display individual course grades and the final **CGPA** to the user.

✅ TASK 2: Login and Registration System

- Create a registration function that takes **username** and **password** as input.
- Validate the inputs and check for duplicate usernames if needed.
- Store user credentials securely in a file (one file per user or a database file).
- Implement a **login** function that reads credentials and verifies user identity.
- Provide appropriate success or error messages for **registration** and login.

✅ TASK 3: Sudoku Solver

- Represent the **Sudoku grid** as a 2D array.
- Implement a backtracking algorithm to fill empty cells with valid numbers.
- Check for the Sudoku rules (row, column, and 3x3 subgrid constraints) before placing a number.
- Recursively try possible numbers until the puzzle is solved.
- **(Optional)** Add a GUI for easier user input and display of the solution.

✅ TASK 4: Banking System

- Design classes for **Customer**, **Account** and **Transaction** with necessary attributes.
- Implement functions to create and manage customers and accounts.
- Include features for **deposits**, **withdrawals** and **fund transfers**.
- Store transaction history and allow users to view recent transactions.
- Display account information like balance and **transaction details to customers**.

🚨 Important Note

Internship Completion Criteria:
To be eligible for the internship certificate, participants must complete a minimum of **two or three tasks**. Submitting only one task will be considered **incomplete** and certificates will **not** be issued in such cases.

📤 Submission Details

A submission form will be shared in your respective **WhatsApp group**. You are required to submit your completed task only through that form. Please follow the instructions mentioned in the form carefully to ensure your submission is accepted.

📞 Contact Information

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