Digital Clock

1. Title Page

Project Title: Digital Clock

Course: Programming in C

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2. Abstract

This project implements a **Digital Clock** using the C programming language. The primary objective is to display the current time in hours, minutes, and seconds, updating dynamically on the console. The program demonstrates the use of **loops, functions, header files, and time handling in C**. It provides a simple yet effective way to simulate a real-time clock within a terminal environment.

The project highlights concepts such as **modular programming, delay functions, and formatted output**, offering a practical example of how C can be used to build time-based applications.

3. Problem Definition

Traditionally, clocks are physical devices that display time. In programming, simulating a clock requires handling **time values, updating them continuously, and formatting the output**.

The goal of this project is to develop a **digital clock application in C** that:

- Displays time in HH:MM:SS format
- Updates every second
- Runs continuously until terminated by the user
- Demonstrates modular coding practices

4. System Design

4.1 Algorithm

Main Menu Algorithm:

1. Start
2. Initialize time variables (hours, minutes, seconds)
3. Display time in HH:MM:SS format
4. Wait for one second
5. Increment seconds, adjust minutes/hours when needed
6. Repeat steps 3–5 continuously

5. Implementation Details

Programming Concepts Used:

- Loops (while, for)
- Functions (modular design)
- Header files (time.h, windows.h or unistd.h)
- Delay functions (Sleep() or usleep())
- Formatted output (printf())

6. Conclusion & Future Work

The **Digital Clock project** successfully simulates a real-time clock in the console using C. It demonstrates practical use of loops, delays, and formatted output.

Future Enhancements:

- Add **alarm functionality**
- Display **date along with time**
- Provide **12-hour/24-hour format toggle**
- Build a **Graphical User Interface (GUI)** version
- Synchronize with **system time**

Sample Output:

```
PS C:\Practice> & 'c:\Users\Priyanshu\.vscode\extensions\ms-vscode.cpptools-1.29.1-win32-x64\debugAdapters\bin\WindowsDebugLauncher.exe' '--stdin=Microsoft-MIEngine-In-11vp2d5j.qqn' '--stdout=Microsoft-MIEngine-Out-ifk23hoe.g3r' '--stderr=Microsoft-MIEngine-Error-cyd3tf5q.jbm' '--pid=Microsoft-MIEngine-Pid-bll2a4gu.zme' '--dbgExe=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'

=== Digital Clock ===

30-11-2025
03:08:08 PM

=== Digital Clock ===

30-11-2025
03:08:09 PM

=== Digital Clock ===

30-11-2025
03:08:10 PM

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```