# Project Proposal

Subject: COAL (Computer Organisation and Assembly Language)

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## Title: Smart Security Lock System Using MASM Assembly Language

### Purpose / Objective:

The main objective of this project is to design and simulate a secure digital keypad lock using Assembly Language. The system will allow a user to enter a passcode to unlock access. It will verify the entered password, provide access control decisions, and enhance security by limiting incorrect attempts.

### How to Achieve It (Tools Used):

To achieve this project successfully, the following tools and environment will be used:

| Tool / Technology | Purpose |
|---|---|
| MASM (Microsoft Macro Assembler) | To develop and assemble assembly language code |
| DOS/Windows Console | For program execution and interaction |
| Registers & Memory Storage | To store password, user input, counters |
| Keyboard I/O Interrupts | To capture keypad input from user |

## Coding Components Used:

The project will include the following key Assembly Language concepts:

- **Loops** for repeated password attempts.
- **Conditional branching** for access decisions.
- **Memory & registers** to store and compare values.
- **String comparison logic** for password matching.
- **ASCII conversion** for numeric key input.
- **Interrupts (INT 21h)** for keyboard input and screen display.
- **Counters** to track the number of incorrect attempts.
- **Security alert logic** after failed attempts.

## Flow & Expected Output:

### Program Flow:

1. Display welcome and password prompt.
2. Read user input (masked as ●●●●).
3. Compare the input with the stored secret password.
4. If match, then display “Access Granted: Smart Lock Opened”.
5. If wrong, then increase the attempt counter.
6. After 3 wrong attempts → Show “Security Alert: System Locked”.
7. Program ends or waits for admin override password.

### Expected Output Screens:

- Correct Password:

Enter Passcode: ●●●●

Access Granted

Door Unlocked

• Wrong Password (1st or 2nd time):

Access Denied

Try Again

• After 3 failed attempts:

Security Alert Activated

System Locked

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# THE END