**ASSIGNMENT NOTE**

**Subject: Embedded Programming Principle**

**Topic: Pass Code**

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# Objectives

* Build a circuit that check passcode.
* Write a C program in STM32 CUBE IDE that check passcode from Putty.
* Flash code and debug project.

# Requirement

## Requirement

Write a program that will do the following:

* accept up to a 4 digit value from the virtual serial port on the STM Board.
* If the 4 digit value is one of the 10 pass-codes stored in an array, issue an auditory feedback signal and the text "access granted" to the serial port.
* If it is not one of the 10 allowable pass-codes, issue another appropriate auditory feedback signal and the text "access denied".
* Also illuminate a red led if the access is not granted and a green led if access is granted.

As always follow the coding standards for the ESD department.

# Hardware and Software design

## Hardware Design

A circuit board with wires and a green and red ribbon

Description automatically generated

Figure 3‑1: Breadboard's circuit

## Software Design

Create an array Passcode [10], PasscodeOwner[10] and UniquePassCode that will contain all 10 passcode, their user and their own Unique passcode.

A close-up of a computer code

Description automatically generated

Figure 3‑2: Declaring PassCode

Create a simple changeSpeakerFrequency function that will calculate the new prescaler whenever change to a new frequency.

A screenshot of a computer program

Description automatically generated

Figure 3‑3: changeSpeakerFrequency's function

It also require to have an auditory feedback so create 2 more functions, one for when the correct passcode was typed and one for the wrong one.

A screenshot of a computer program

Description automatically generated

Figure 3‑4: playCorrectSound’s function

This function will create a ring tone from 3 different frequency.

A screen shot of a computer program

Description automatically generated

Figure 3‑5: playWrongSound's function

Function for checking the user input passcode and compare it with the system passcode

A screenshot of a computer code

Description automatically generated

Figure 3‑6: checkPassCode's function

Also a function in which will find the owner of that PassCode

A screenshot of a computer code

Description automatically generated

Figure 3‑7: checkOwnerCode 's function

A function to change the RGB LED color

A screenshot of a computer program

Description automatically generated

Figure 3‑8: setLed's function

And a function to reset the user passcode

**void** **resetPassCode**(**char** usrReset)

{

**int** usrUniqueCode, usrNewCode, ownerCodeName = 0;

**int** numberAttemptLeft = 0;

**if** (usrReset == 'y')

{

**for** (**int** i = NUM\_ATTEMPT; i > 0; i--)

{

**printf**("Please type in your UNIQUE passcode: \r\n");

**scanf**("%d", &usrUniqueCode);

**if** (checkPassCode(usrUniqueCode) == USERCODE\_MATCH)

{

**printf**("Access Granted\r\n");

setLed(GREEN);

playCorrectSound();

numberAttemptLeft = 3;

**break**;

}

**else**

{

**printf**("Access Denied\r\n");

**printf**("You have %d attempt left \r\n", i - 1);

setLed(RED);

playWrongSound();

numberAttemptLeft = i - 1;

**continue**;

}

}

// Zero attempt left for resetting pass code

**if** (numberAttemptLeft == 0)

{

**printf**("Please contact the owner for further assist\r\n");

**printf**("~~~~~~~~~~~~~~~\r\n");

**return**;

}

// Resetting user passcode

**else**

{

ownerCodeName = checkOwnerCode(usrUniqueCode); //Get Owner Name

**printf**("Welcome Mrs %c\r\n", passCodeOwner[ownerCodeName]);

**printf**("Please type in your new code\r\n");

**scanf**("%d",&usrNewCode);

passCode[ownerCodeName] = usrNewCode;

**printf**("Your new passcode have been saved, please log in again\r\n");

**printf**("~~~~~~~~~~~~~~~\r\n");

**return**;

}

}

**else**

{

**printf**("~~~~~~~~~~~~~~~\r\n");

**return**;

}

}

# Result

Video demo’s: [MTran\_Assignment2\_Embedded\_vid.mp4](https://stuconestogacon-my.sharepoint.com/:v:/g/personal/mtran8451_conestogac_on_ca/EYfk3a97pshAs7PEMuYhzQgBvHkhhV9xCGwRDPzay5BitA?e=9IEyH9)

**REFERENCES**