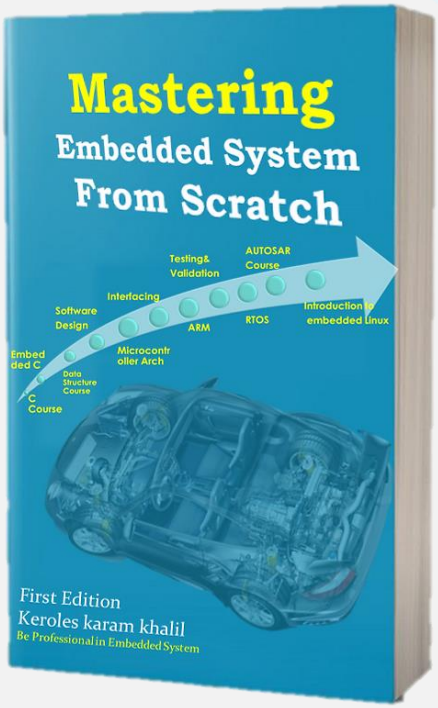


Pressure Controlling System

First Term (Project 1)

Eng. Mostafa Tera

Mastering_Embedded_System_Diploma

TABLE OF CONTENTS

CASE STUDY

- **A "CLIENT" EXPECTS YOU TO DELIVER THE SOFTWARE OF THE FOLLOWING SYSTEM:**

Specification (from the client):

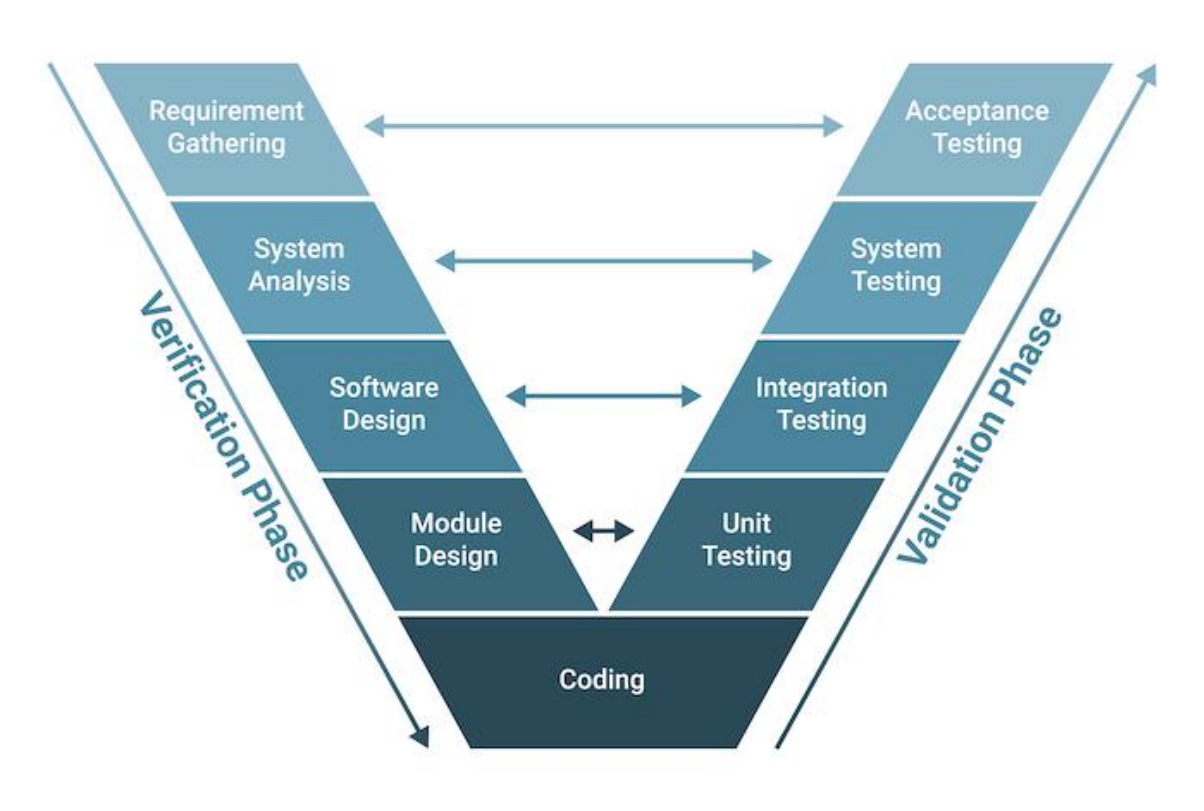
- Pressure controller informs the crew of a cabin with an alarm when the pressure exceeds 20 bars in the cabin
- The alarm duration equals 60 seconds.
- keeps track of the measured values.

Pressure Controller Assumptions:

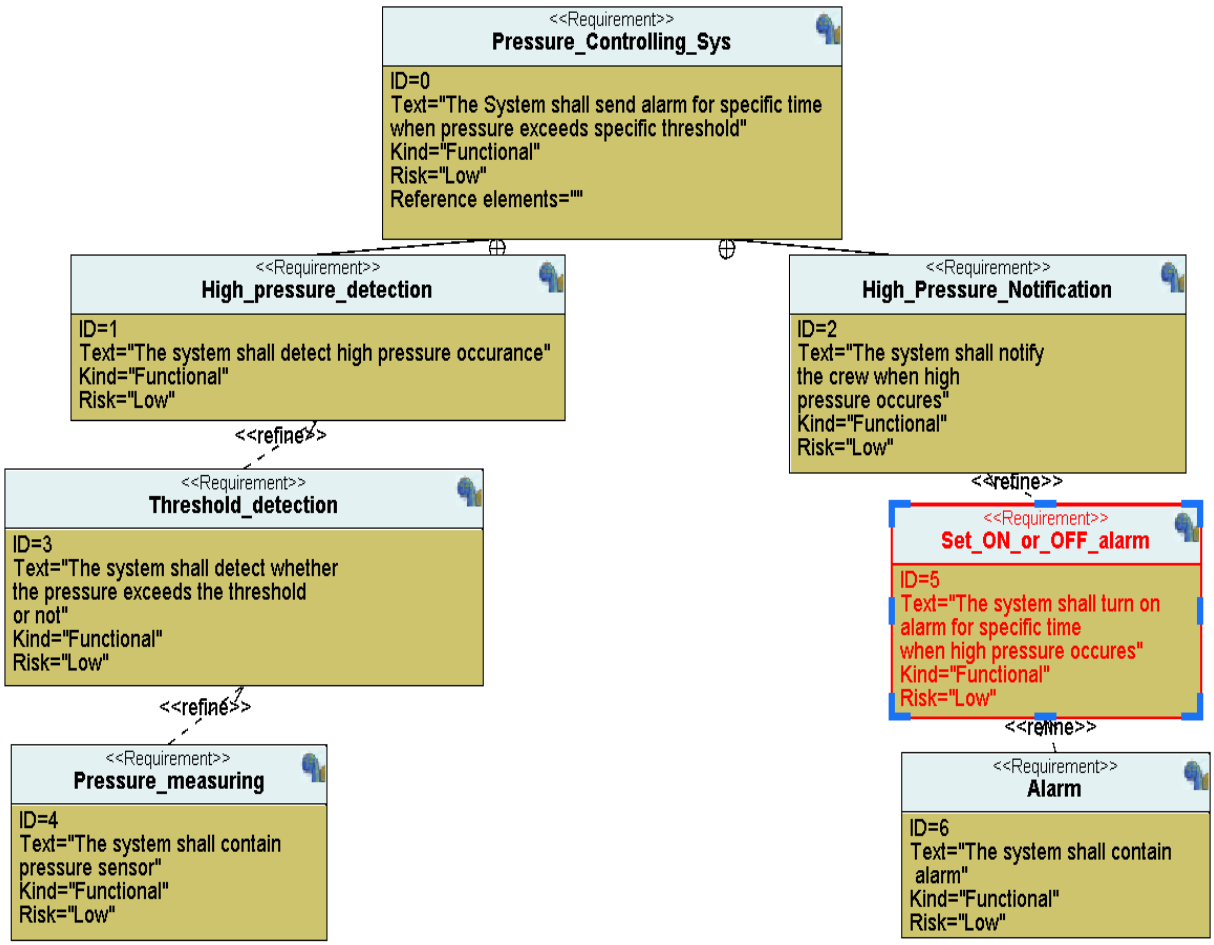
- The controller set up and shutdown procedures are not modeled
- The controller maintenance is not modeled
- The pressure sensor never fails
- The alarm never fails
- The controller never faces power cut

METHOD

V-Model

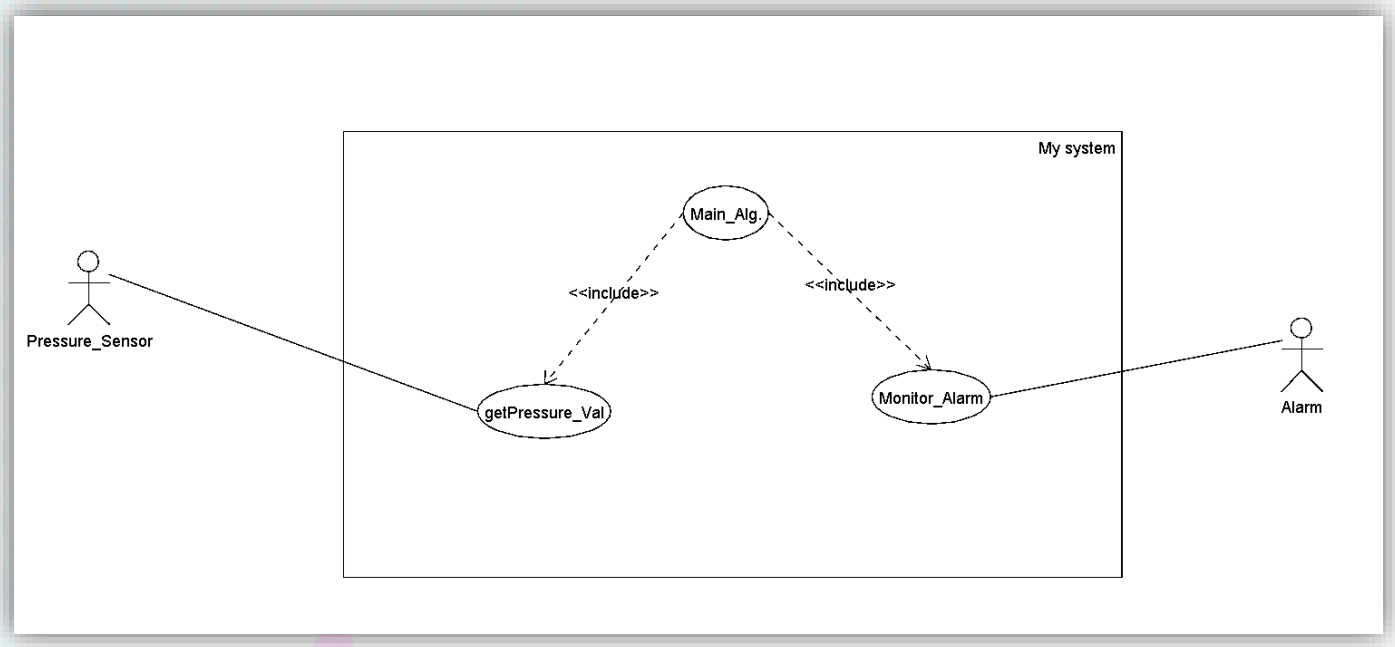


REQUIREMENT DIAGRAM

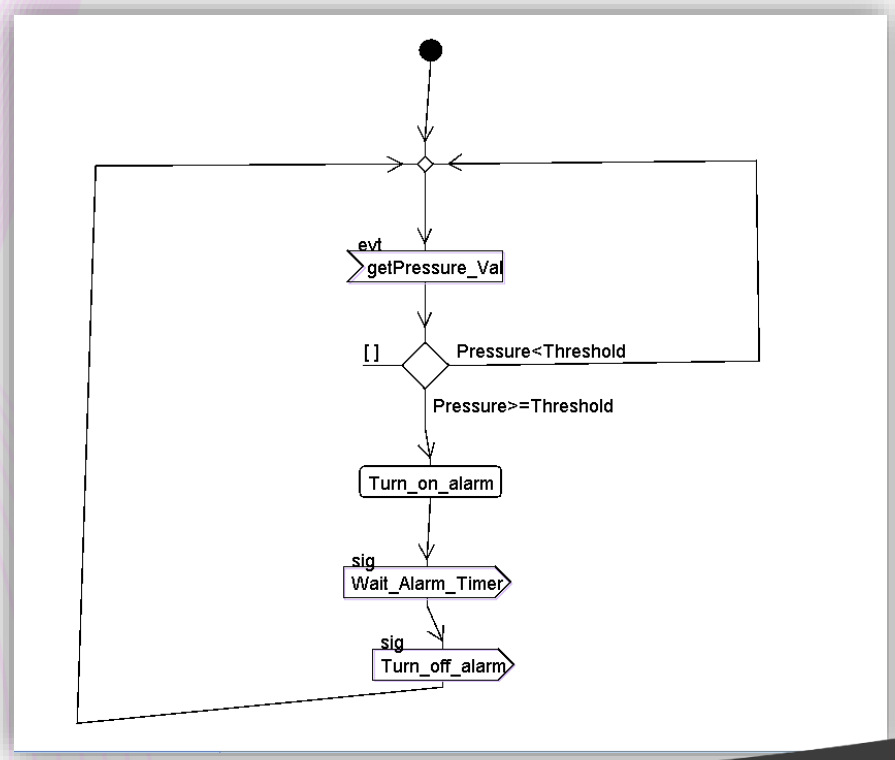


SYSTEM ANALYSIS

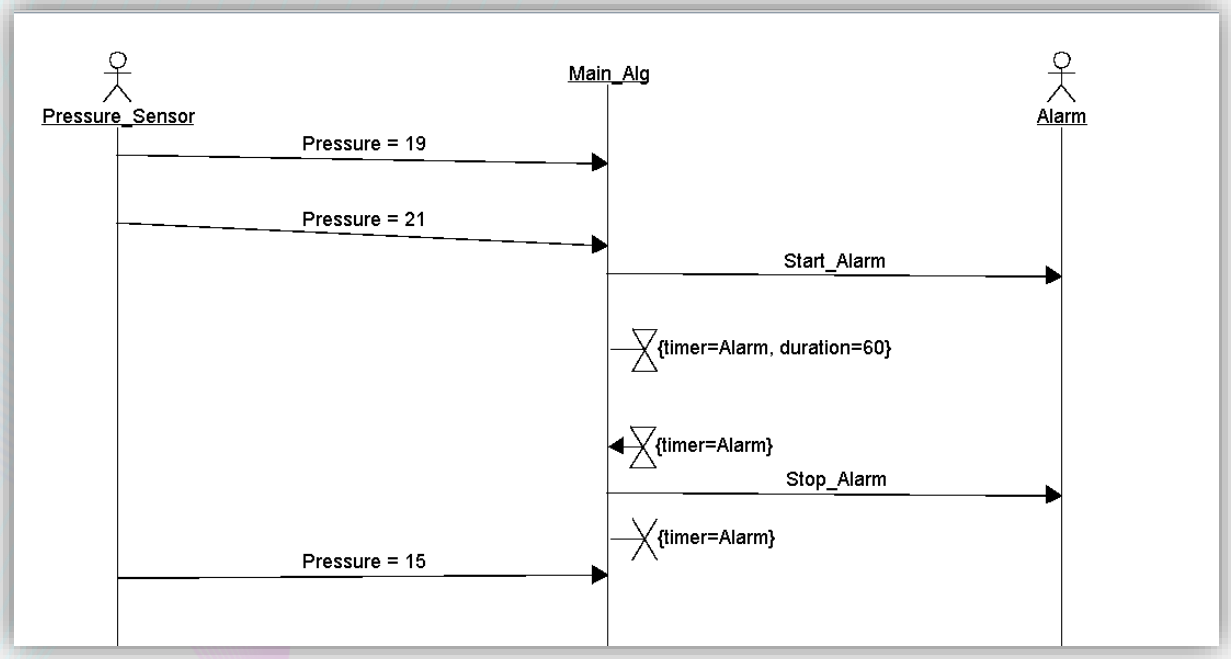
USE CASE DIAGRAM



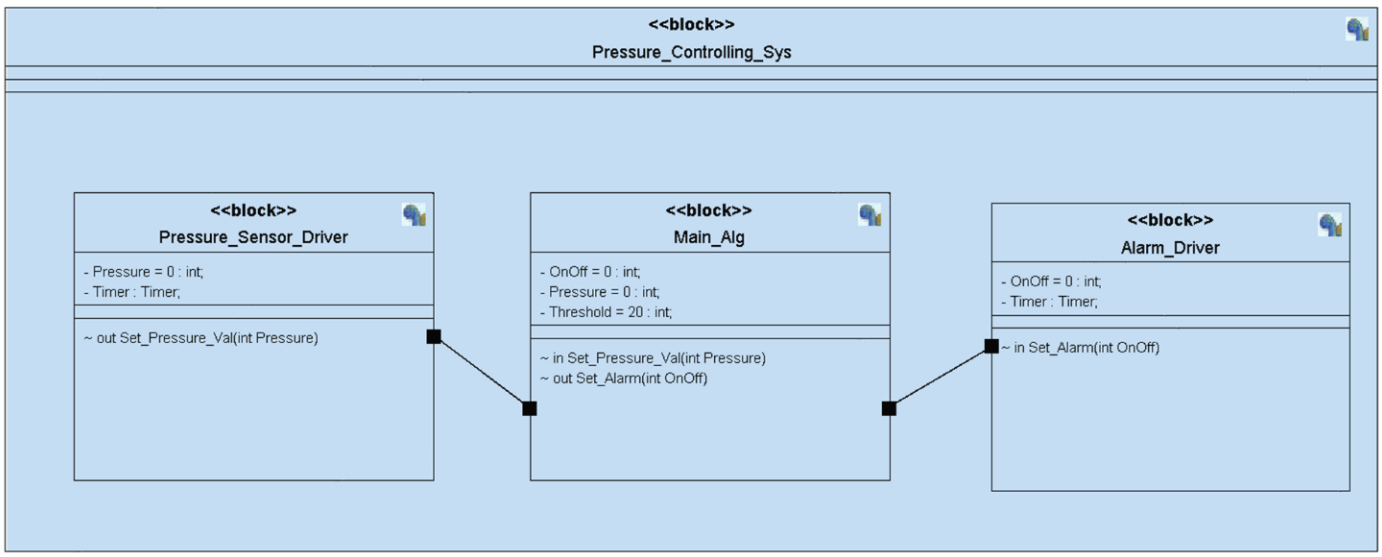
Activity Diagram



Sequence Diagram

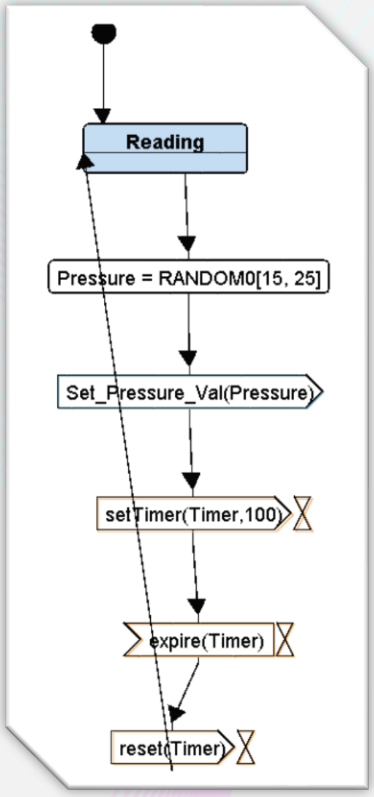


SYSTEM DESIGN

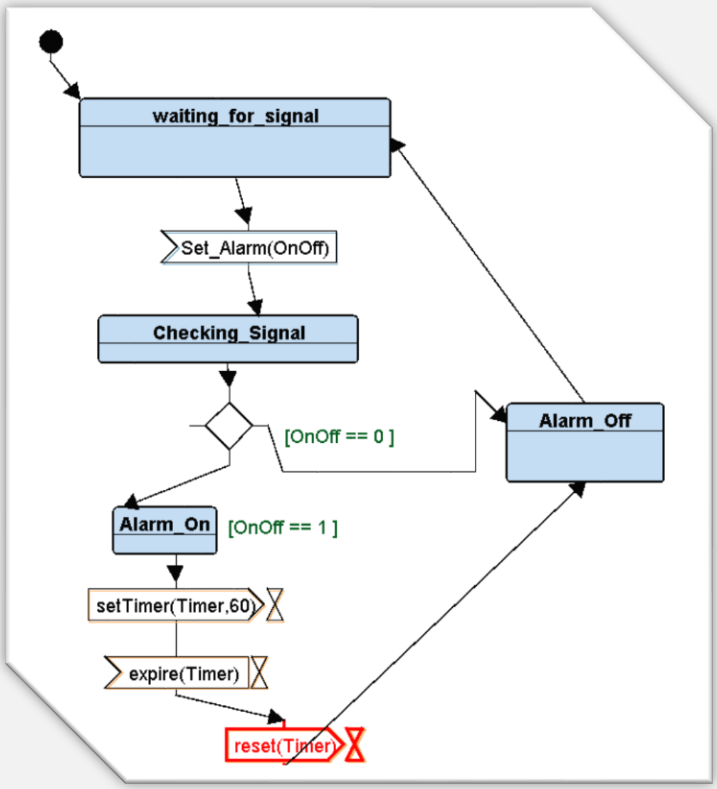


STATE MACHINES OF EACH BLOCK

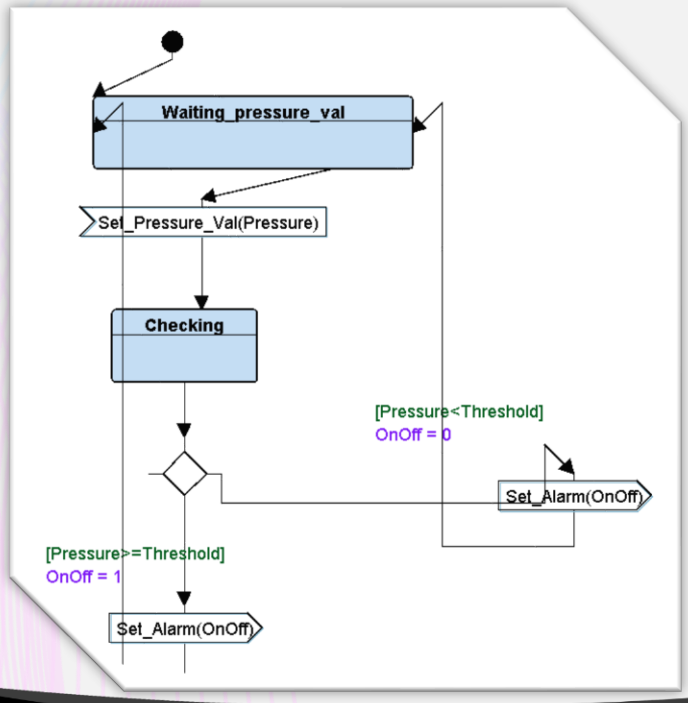
- Pressure Sensor Driver



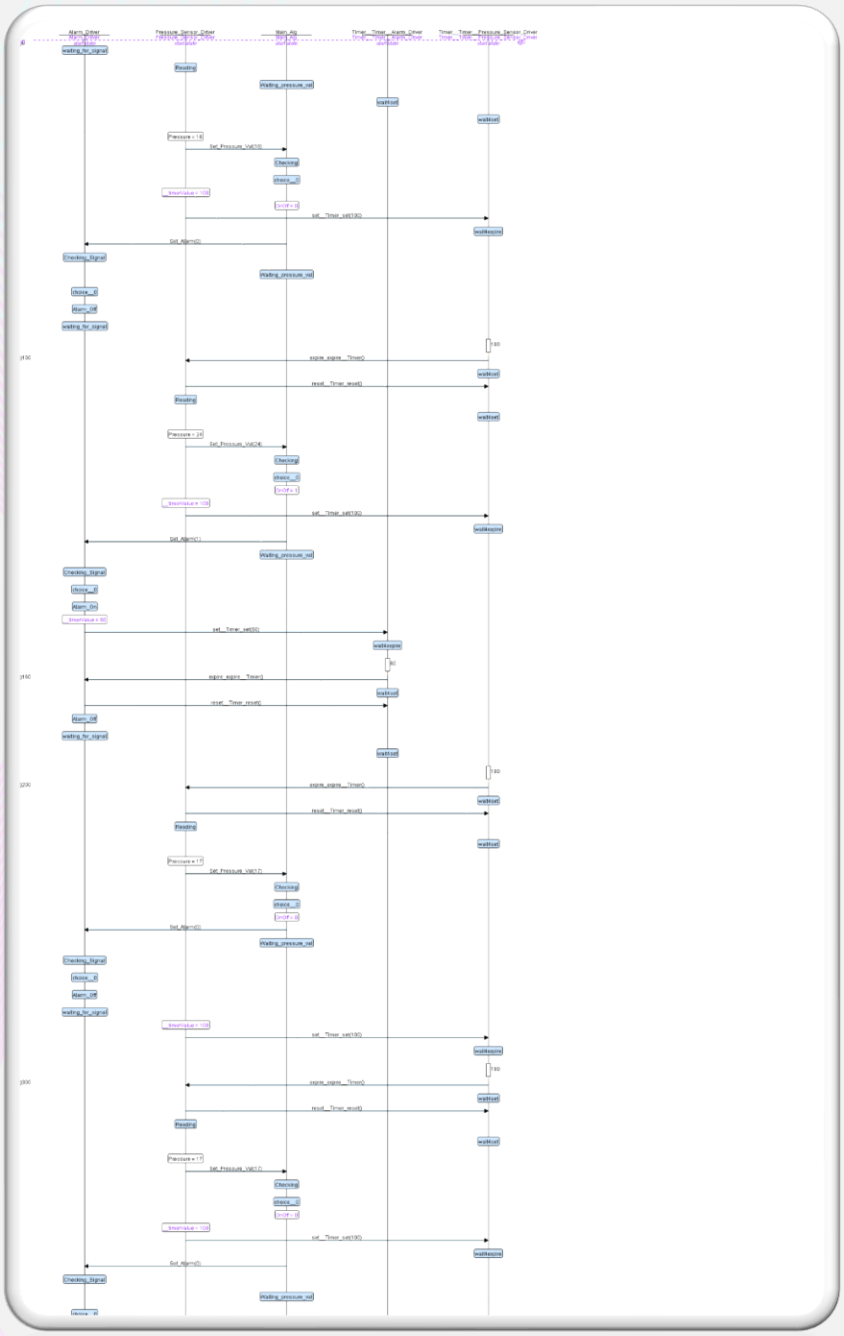
- Alarm Driver



- Main Algorithm

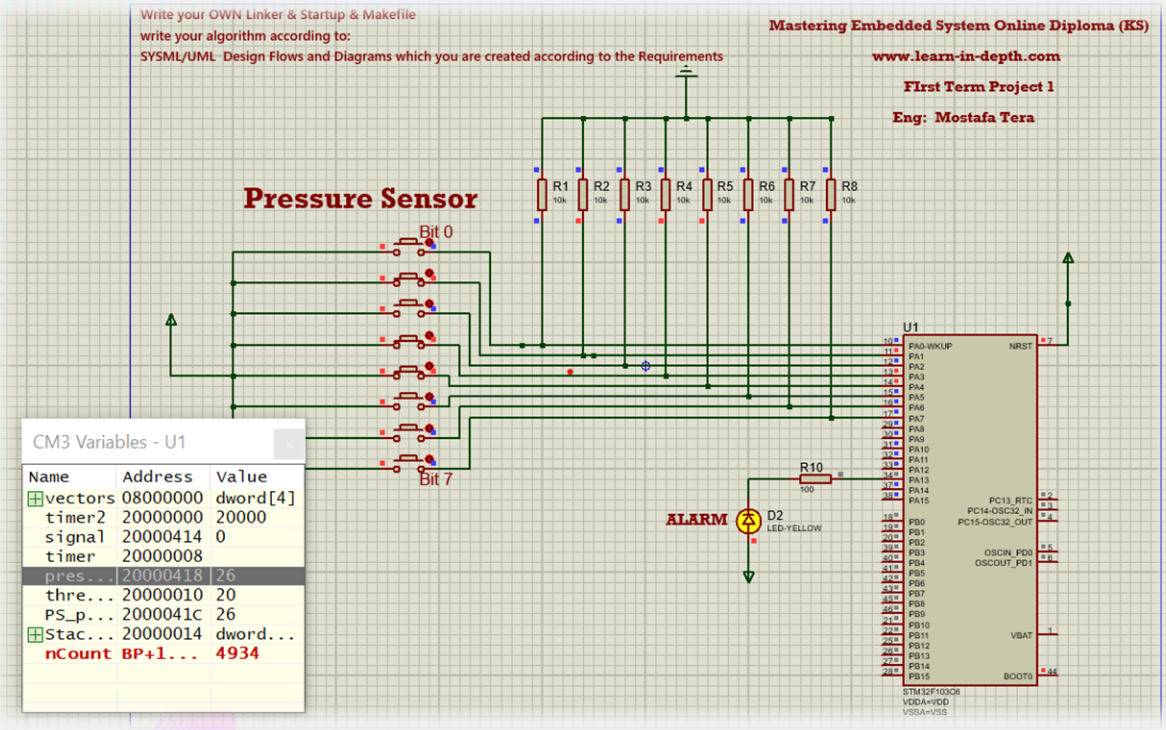


LOGIC

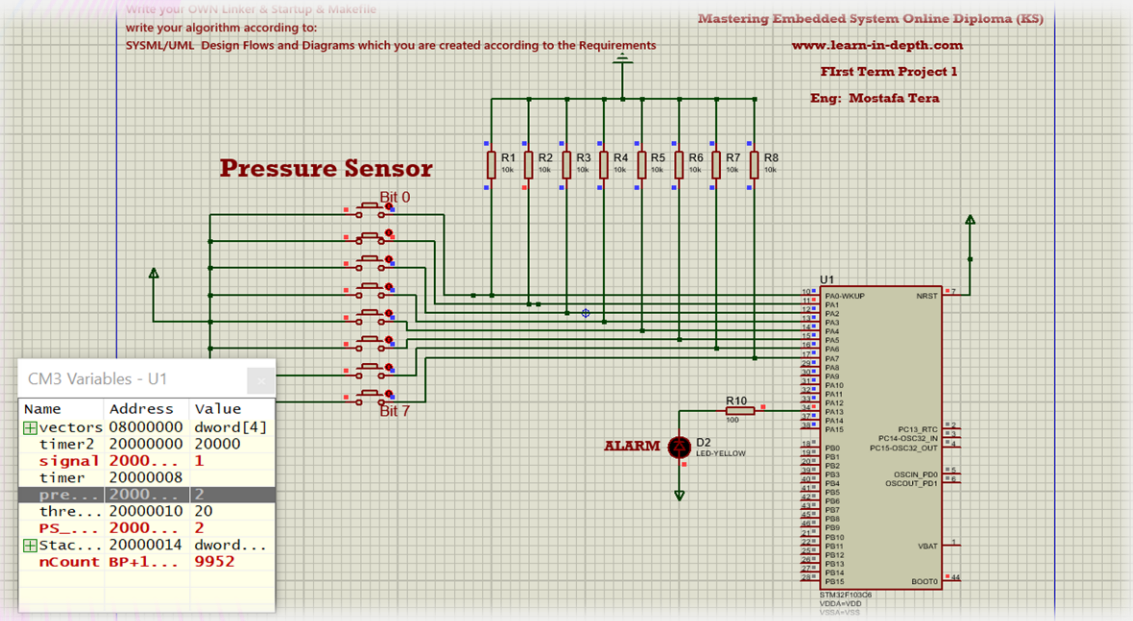


PROTEUS

PRESSURE (26) > Threshold



Pressure (2) < Threshold



Section Table

```
$ arm-none-eabi-objdump.exe -h Pressure_Control_Project.elf

Pressure_Control_Project.elf:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         00000328  08000000  08000000  00008000  2**2
                  CONTENTS, ALLOC, LOAD, READONLY, CODE
  1 .data         00000014  20000000  08000328  00010000  2**3
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000418  20000014  0800033c  00010014  2**2
                  ALLOC
  3 .debug_info   000005b9  00000000  00000000  00010014  2**0
                  CONTENTS, READONLY, DEBUGGING
  4 .debug_abbrev 00000308  00000000  00000000  000105cd  2**0
                  CONTENTS, READONLY, DEBUGGING
  5 .debug_loc    0000024c  00000000  00000000  000108d5  2**0
                  CONTENTS, READONLY, DEBUGGING
  6 .debug_aranges 000000c0  00000000  00000000  00010b21  2**0
                  CONTENTS, READONLY, DEBUGGING
  7 .debug_line   0000027b  00000000  00000000  00010be1  2**0
                  CONTENTS, READONLY, DEBUGGING
  8 .debug_str    00000219  00000000  00000000  00010e5c  2**0
                  CONTENTS, READONLY, DEBUGGING
  9 .comment      00000011  00000000  00000000  00011075  2**0
                  CONTENTS, READONLY
 10 .ARM.attributes 00000033  00000000  00000000  00011086  2**0
                  CONTENTS, READONLY
 11 .debug_frame  000001ac  00000000  00000000  000110bc  2**2
                  CONTENTS, READONLY, DEBUGGING
```

Symbol Table

```
dell@DESKTOP-FGLQQMR MINGW32 /f/Mostafa/Embedded Course/La
$ arm-none-eabi-nm.exe Pressure_Control_Project.elf
20000420 B _E_BSS
20000014 D _E_DATA
08000328 T _E_TEXT
20000014 B _S_BSS
20000000 D _S_DATA
08000140 T alarm_set
20000428 B Alarm_state
20000420 B Alg_state
080001c4 T checking
08000160 T checking_signal
08000010 T Default_HAndler
0800021c T Delay
08000240 T getPressureVal
080002a8 T GPIO_INITIALIZATION
08000010 W H_fault_Handler
080000cc T main
08000010 W NMI_Handler
20000418 B pressure
2000041c B PS_pressure
20000424 B PS_state
080001f4 T read_pressure
0800001c T Reset_Handler
080001a4 T send_pressure
08000258 T Set_Alarm_actuator
20000414 B signal
20000014 b Stack_top
20000010 D threshold
20000008 D timer
20000000 D timer2
08000000 T vectors
```

You can find codes files on : https://github.com/mgtera200/Master-Embedded-System.git