Mastering Embedded System Online Diploma
www.learn-in-depth.com
First Term (Final Project 1)

REPORT

Project Name: High Pressure Detection

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My Profile:
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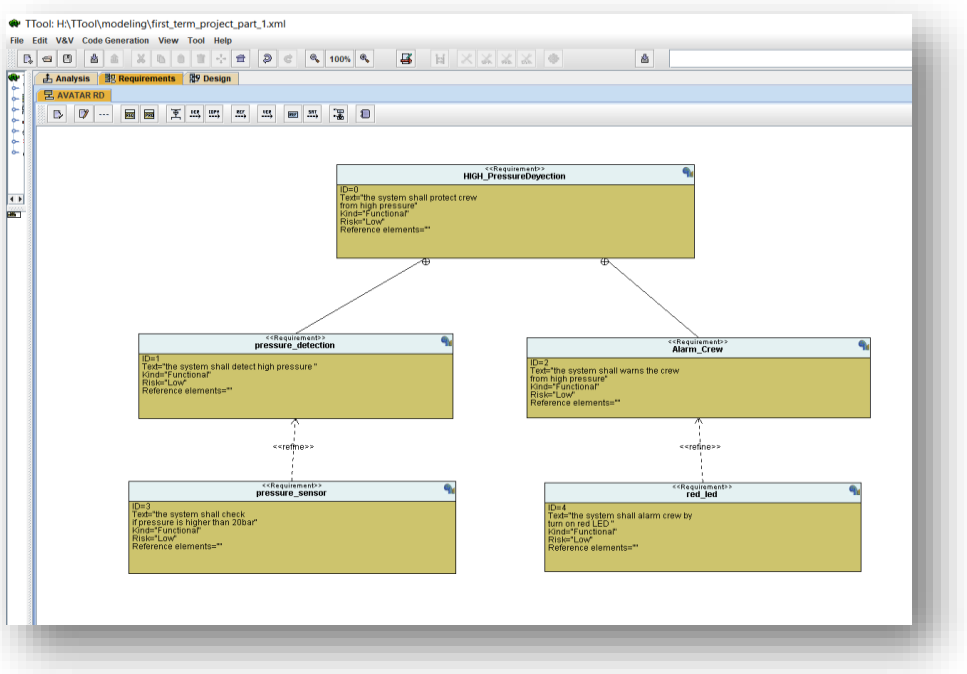
My GitHub Profile:
https://github.com/DiaaAbayazeed/empedded_systems_online_deploma

First do System Design by UML

The **Unified Modeling Language** (**UML**) is a general-purpose, developmental, modeling language in the field of software engineering that is intended to provide a standard way to visualize the design of a system.

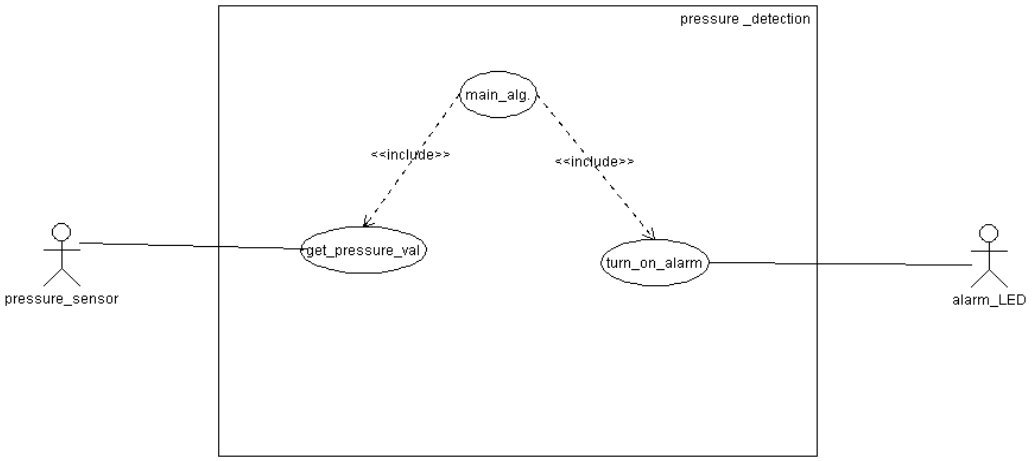
UML tools:

1-Requirement analysis diagrams

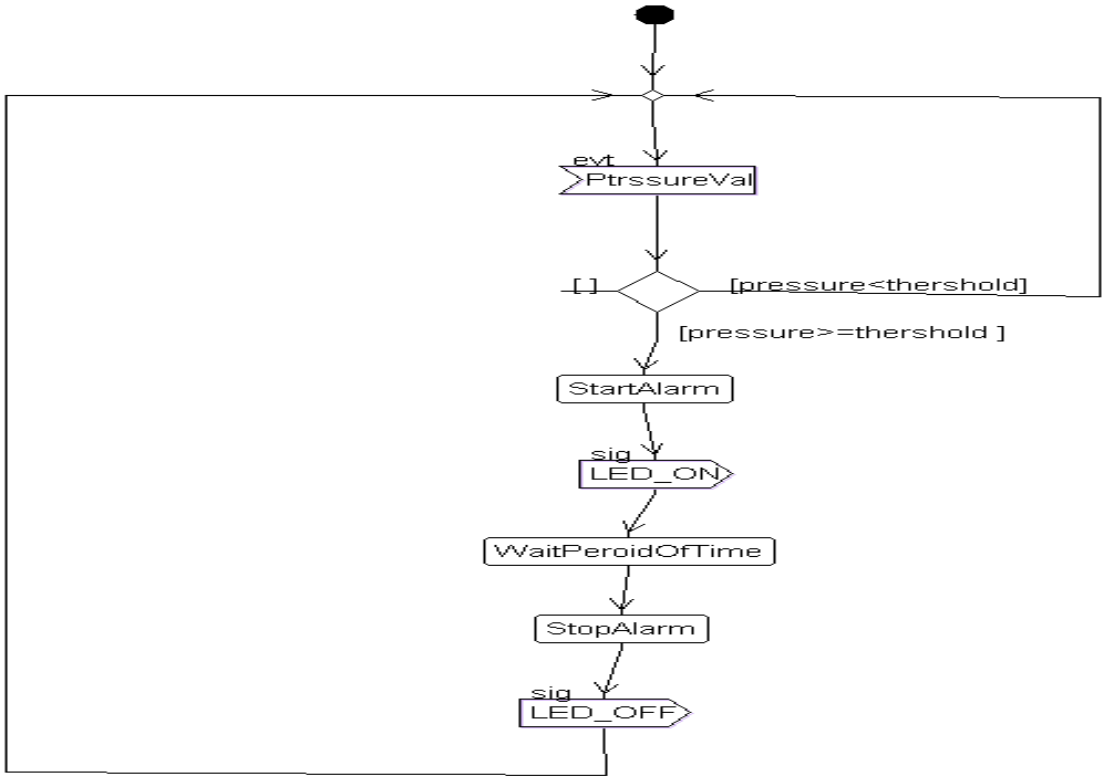


2-System Analysis

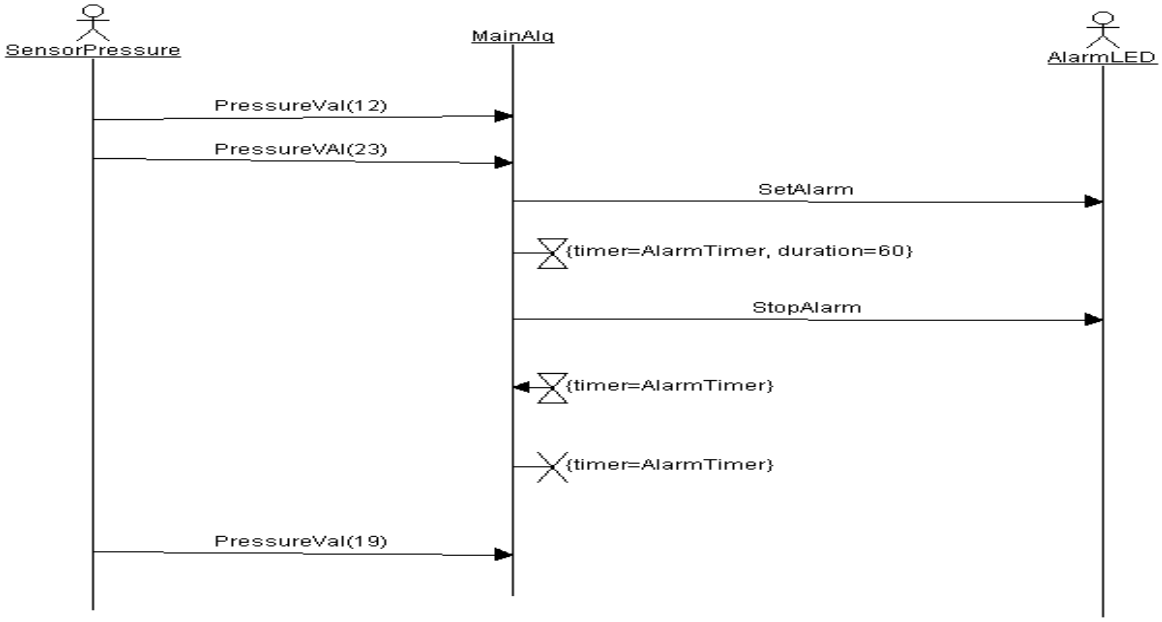
- Use Case Diagram



- Activity Diagram

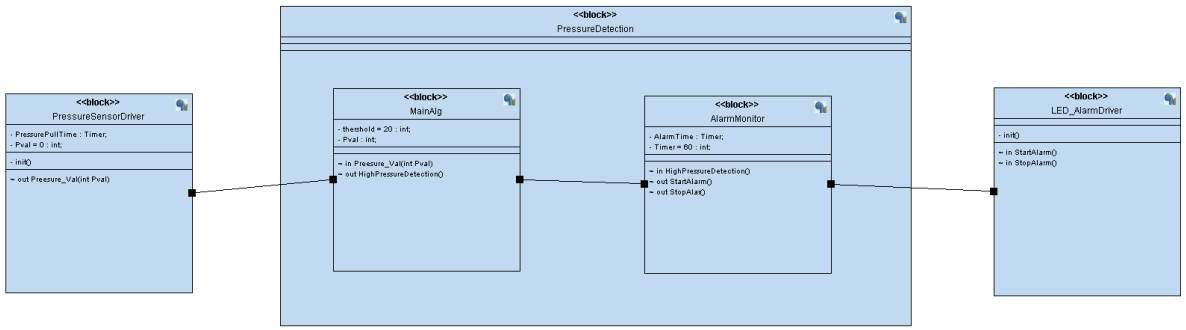


- Sequence Diagram

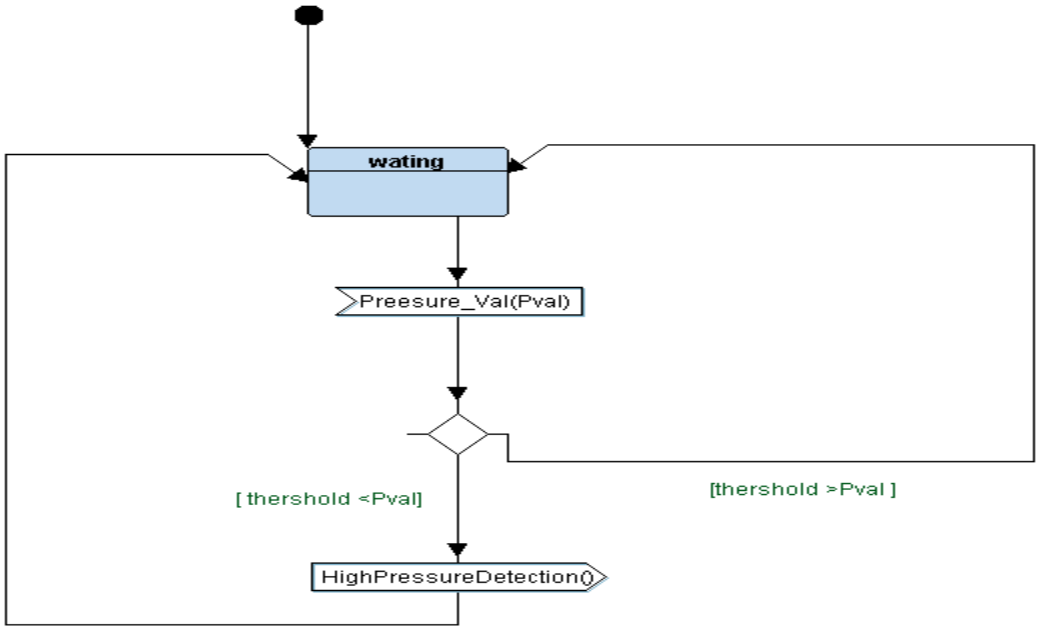


3- Design code

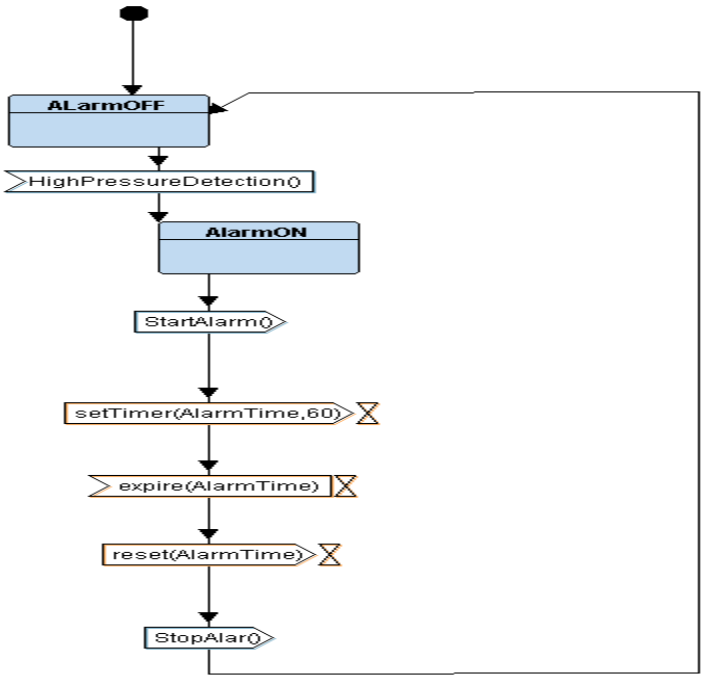
- Block Diagram



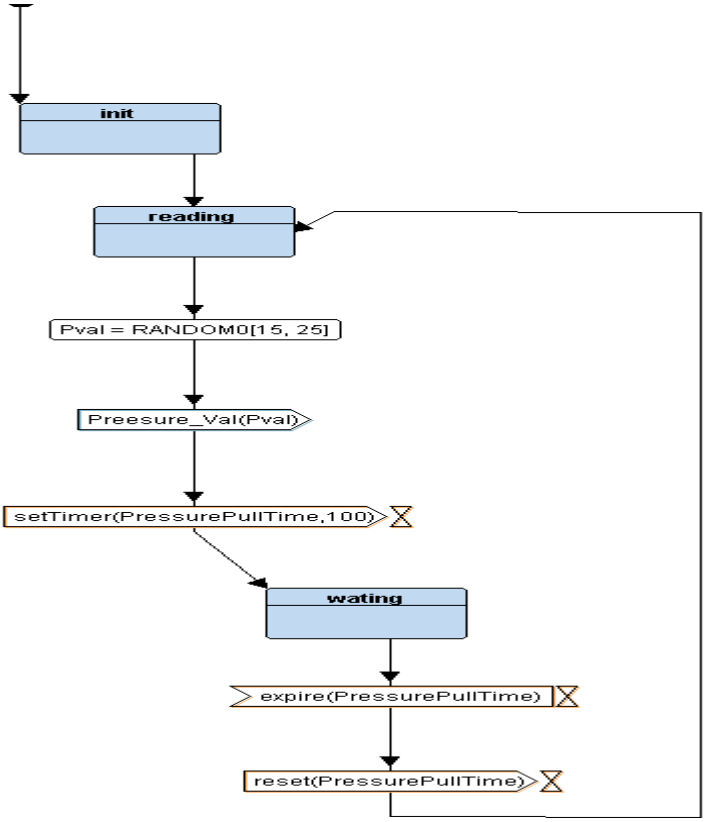
- Main Algorithm



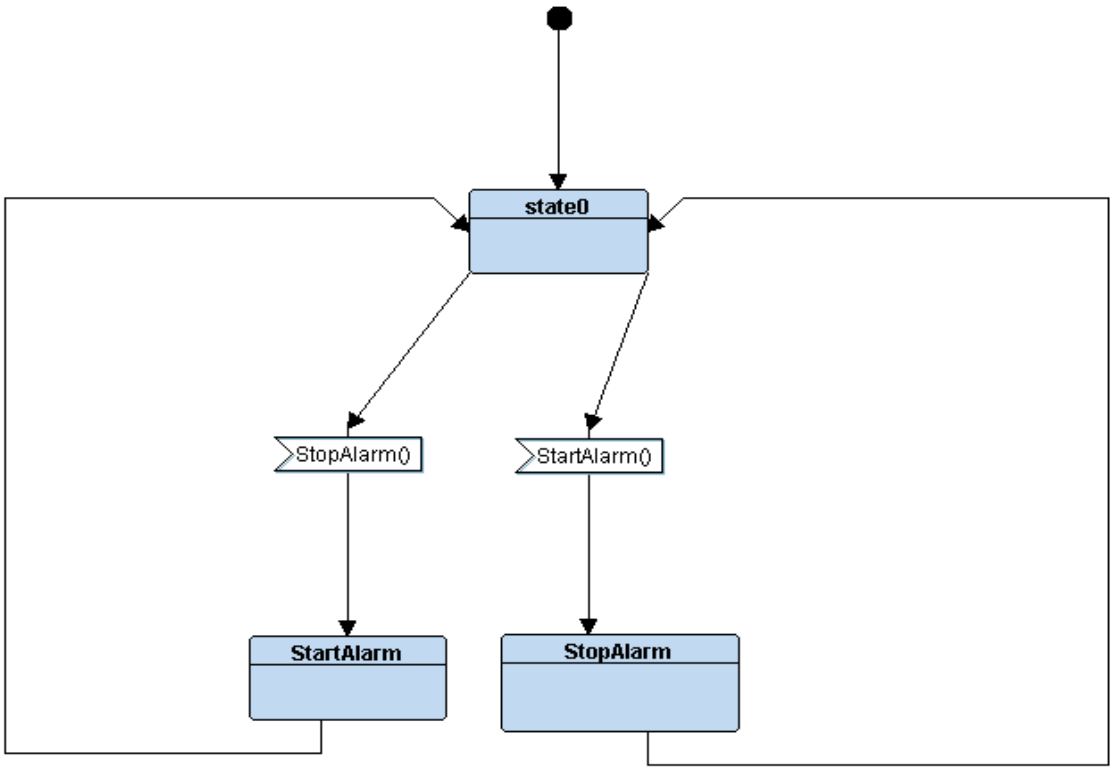
- Monitor Alarm



- Pressure Sensor Driver



- LED Alarm Driver



Second :Codes & Data Sections

Link OF The Code & Map_File in GitHub

https://github.com/DiaaAbayazeed/empedded_systems_online_deploma

- Main data sections

```
Diaa Abayazeed@DESKTOP-6JC9IU9 MINGW32 /h/project part 1
$ arm-none-eabi-objdump.exe -h main.o

main.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         00000030  00000000  00000000  00000034  2**1
                  CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE
  1 .data         00000000  00000000  00000000  00000064  2**0
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  00000064  2**0
                  ALLOC
  3 .debug_info   000009ab  00000000  00000000  00000064  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  4 .debug_abbrev 00000187  00000000  00000000  00000a0f  2**0
                  CONTENTS, READONLY, DEBUGGING
  5 .debug_loc    00000038  00000000  00000000  00000b96  2**0
                  CONTENTS, READONLY, DEBUGGING
  6 .debug_aranges 00000020  00000000  00000000  00000bce  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  7 .debug_line   00000127  00000000  00000000  00000bee  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  8 .debug_str    0000050c  00000000  00000000  00000d15  2**0
                  CONTENTS, READONLY, DEBUGGING
  9 .comment      0000007f  00000000  00000000  00001221  2**0
                  CONTENTS, READONLY
 10 .debug_frame  00000030  00000000  00000000  000012a0  2**2
                  CONTENTS, RELOC, READONLY, DEBUGGING
 11 .ARM.attributes 00000033  00000000  00000000  000012d0  2**0
                  CONTENTS, READONLY
```

- Alarm Monitor Sections

```
Diaa Abayazeed@DESKTOP-6JC9IU9 MINGW32 /h/project part 1
$ arm-none-eabi-objdump.exe -h main.o

main.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         00000030  00000000  00000000  00000034  2**1
                  CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE
  1 .data         00000000  00000000  00000000  00000064  2**0
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  00000064  2**0
                  ALLOC
  3 .debug_info   000009ab  00000000  00000000  00000064  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  4 .debug_abbrev 00000187  00000000  00000000  00000a0f  2**0
                  CONTENTS, READONLY, DEBUGGING
  5 .debug_loc    00000038  00000000  00000000  00000b96  2**0
                  CONTENTS, READONLY, DEBUGGING
  6 .debug_aranges 00000020  00000000  00000000  00000bce  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  7 .debug_line   00000127  00000000  00000000  00000bee  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  8 .debug_str    0000050c  00000000  00000000  00000d15  2**0
                  CONTENTS, READONLY, DEBUGGING
  9 .comment      0000007f  00000000  00000000  00001221  2**0
                  CONTENTS, READONLY
 10 .debug_frame  00000030  00000000  00000000  000012a0  2**2
                  CONTENTS, RELOC, READONLY, DEBUGGING
 11 .ARM.attributes 00000033  00000000  00000000  000012d0  2**0
                  CONTENTS, READONLY
```

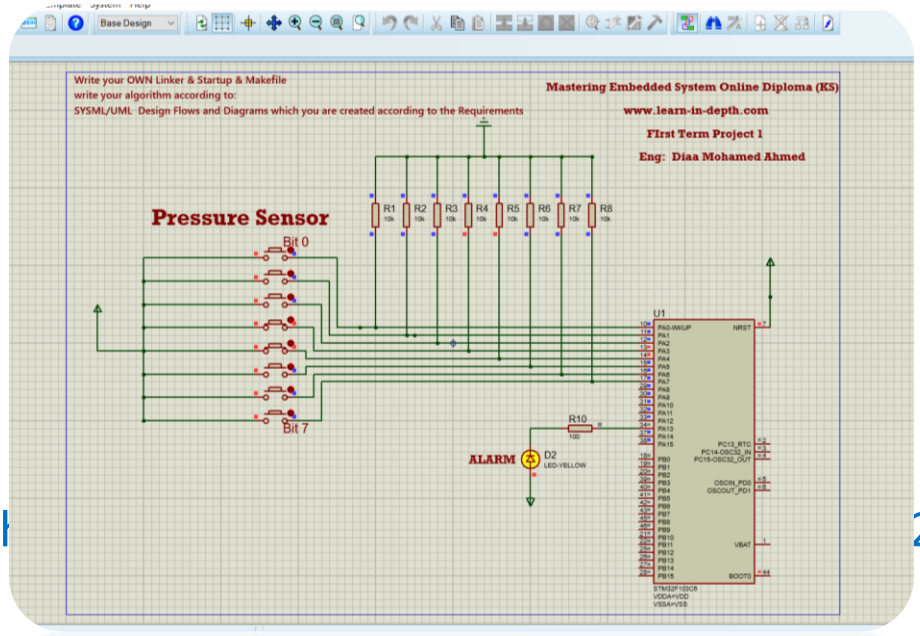
- All Data Sections

```
Diaa Abayazeed@DESKTOP-6JC9IU9 MINGW32 /h/project part 1
$ arm-none-eabi-nm.exe  High_Pressure_Detection.elf
20000000 D _E_bss
20000000 D _E_DATA
00000184 T _E_text
20000000 D _S_bss
20000000 D _S_DATA
00000038 T Alarm_OFF
0000016c T Bus_Fault
00000048 T Delay
00000068 T getPressureVal
000000bc T GPIO_INITIALIZATION
00000154 T H_fault_Handler
0000001c T High_Pressure_Val
0000010c T main
00000160 T MM_Fault_Handler
00000148 T NMI_Handler
0000013c T Reset_Handler
00000080 T Set_Alarm_actuator
00000178 T Usage_Fault_Handler
00000000 T vectors
```

Finally :The Results

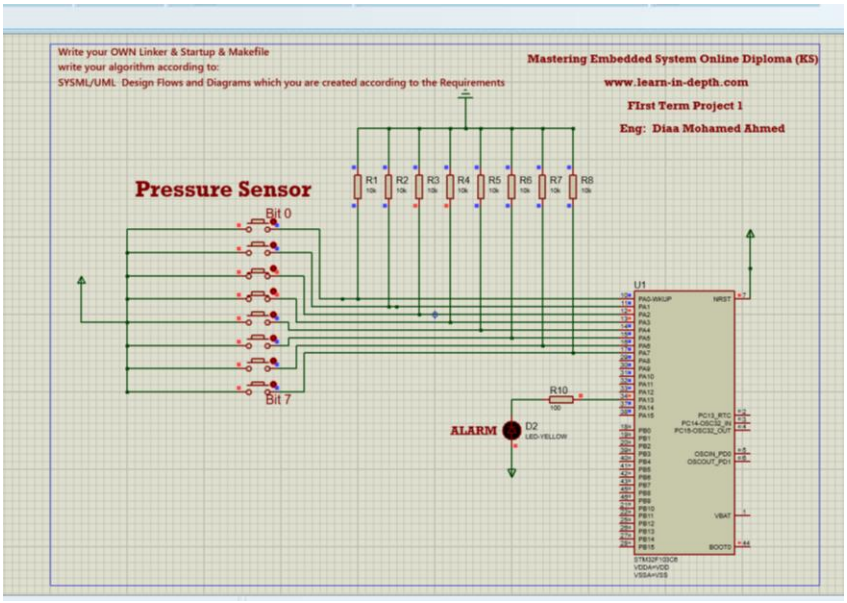
Threshold =20 Pval=2*10^5=32

Pval>threshold>>>>>>>32>20 (LED ON)



Th 2

Is Pval>threshold>>>>>>>12<20 (LED OFF)



Threshold =20 Pval=2*10^2+2*10^6=66

Is Pval>threshold>>>>>>>66>20 (LED ON)