First Term (Final Project 1)

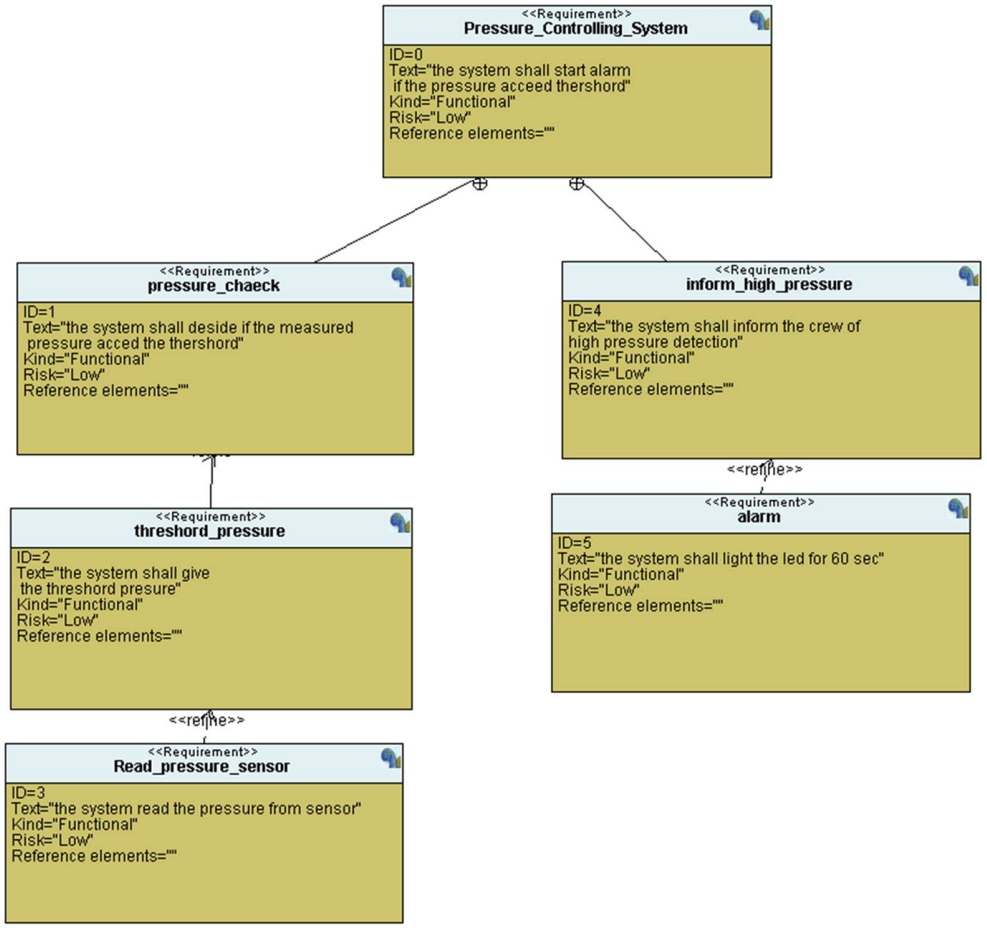
Project Name :Pressure Controller Project

Name: Esraa abdelgaber ali

My Profile : https://www.learn-in-depth-store.com/profile/esraaabdelgaber01/profile

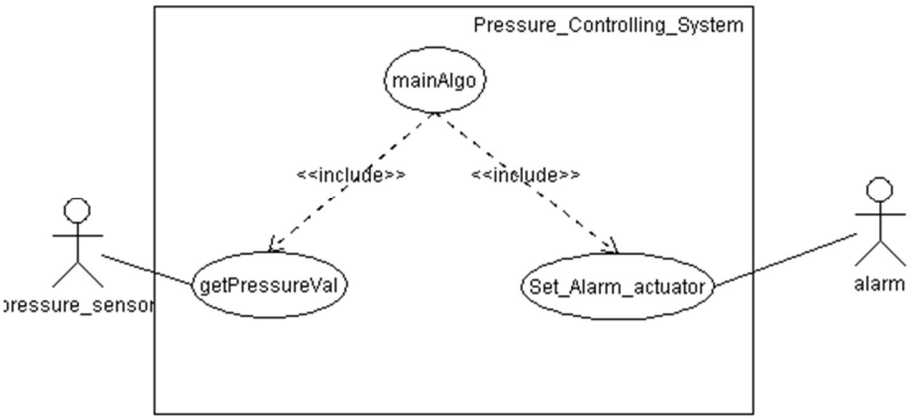
Requirements

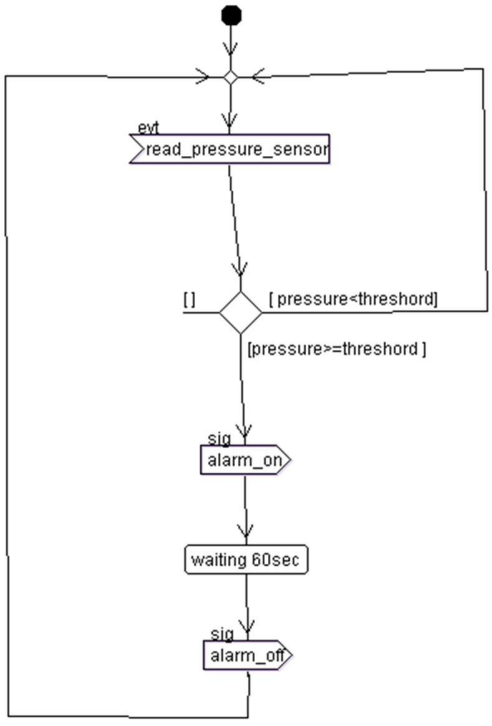
- A pressure controller informs the crew of a cabin with an alarm when the pressure exceeds 20 bars in the cabin
- The alarm duration equals 60 seconds.



System Analysis

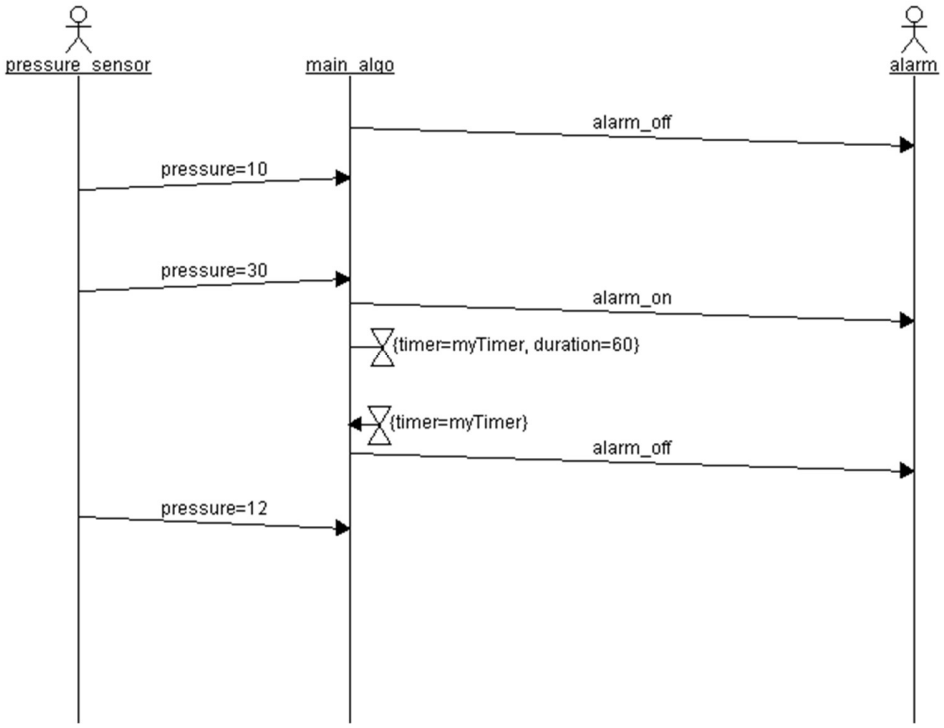
1) Case Diagram



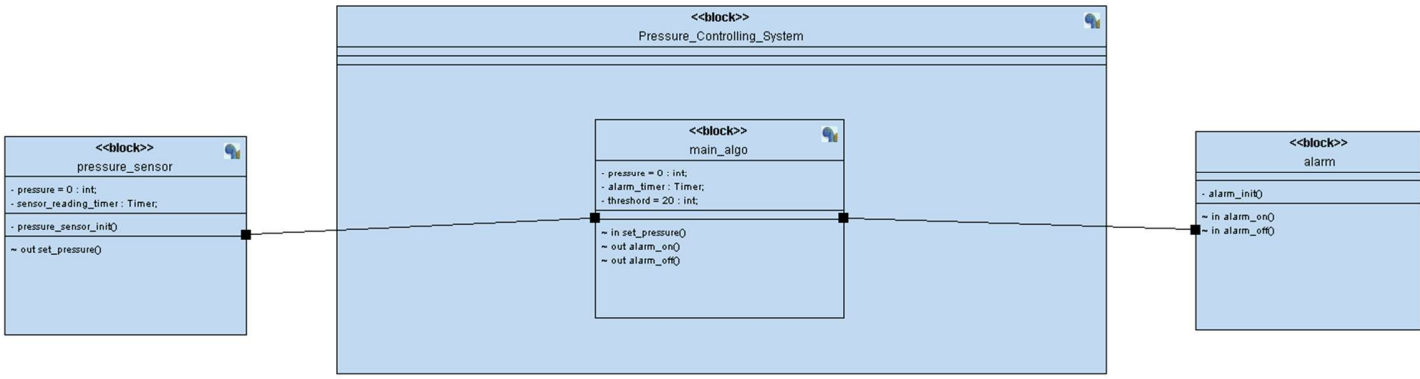


3)Activity Diagram

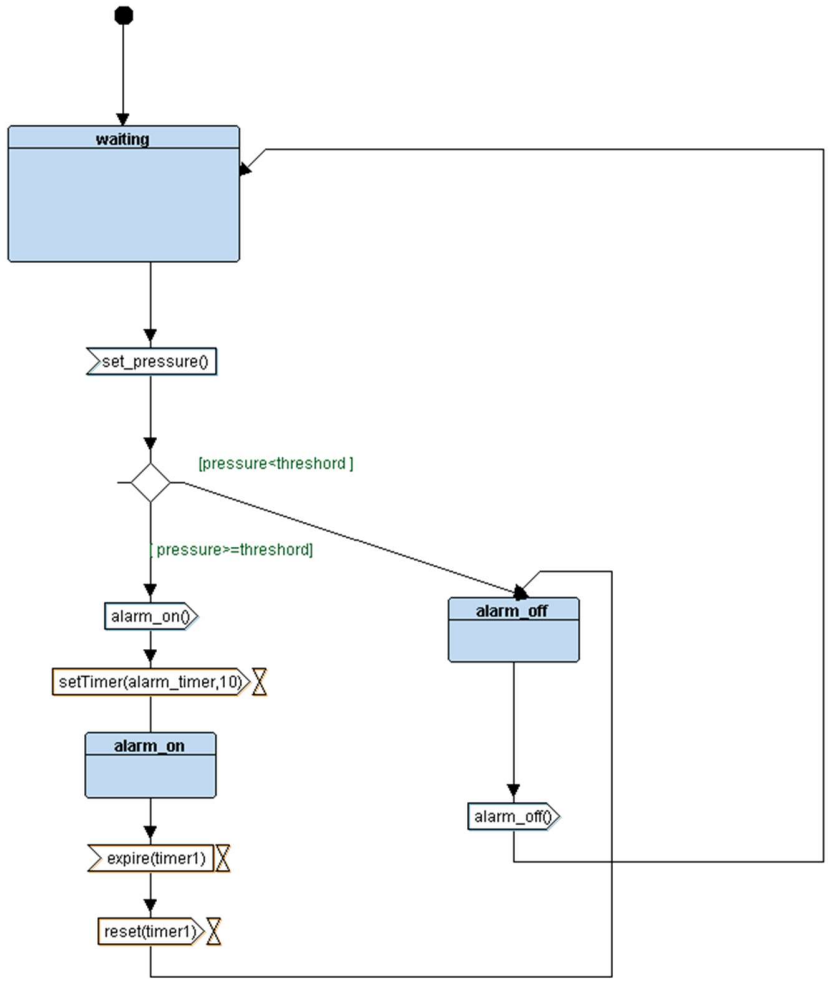
2) Sequence Diagram



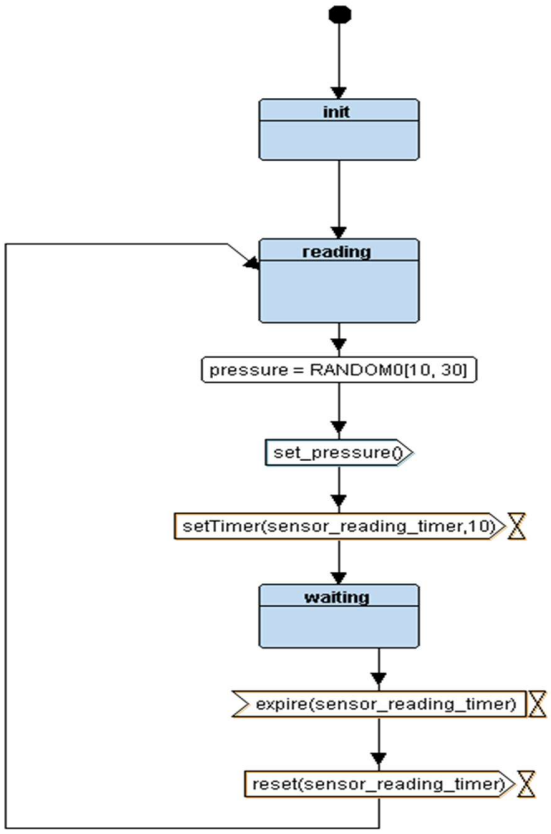
System Design



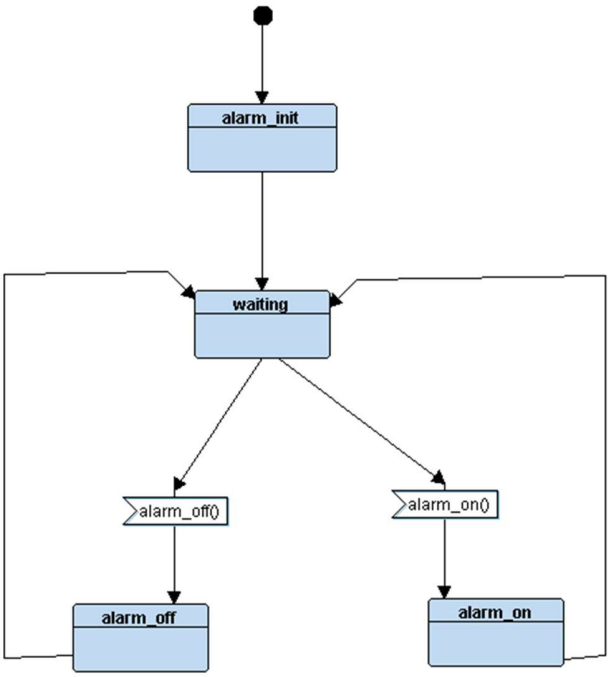
Main algorithm



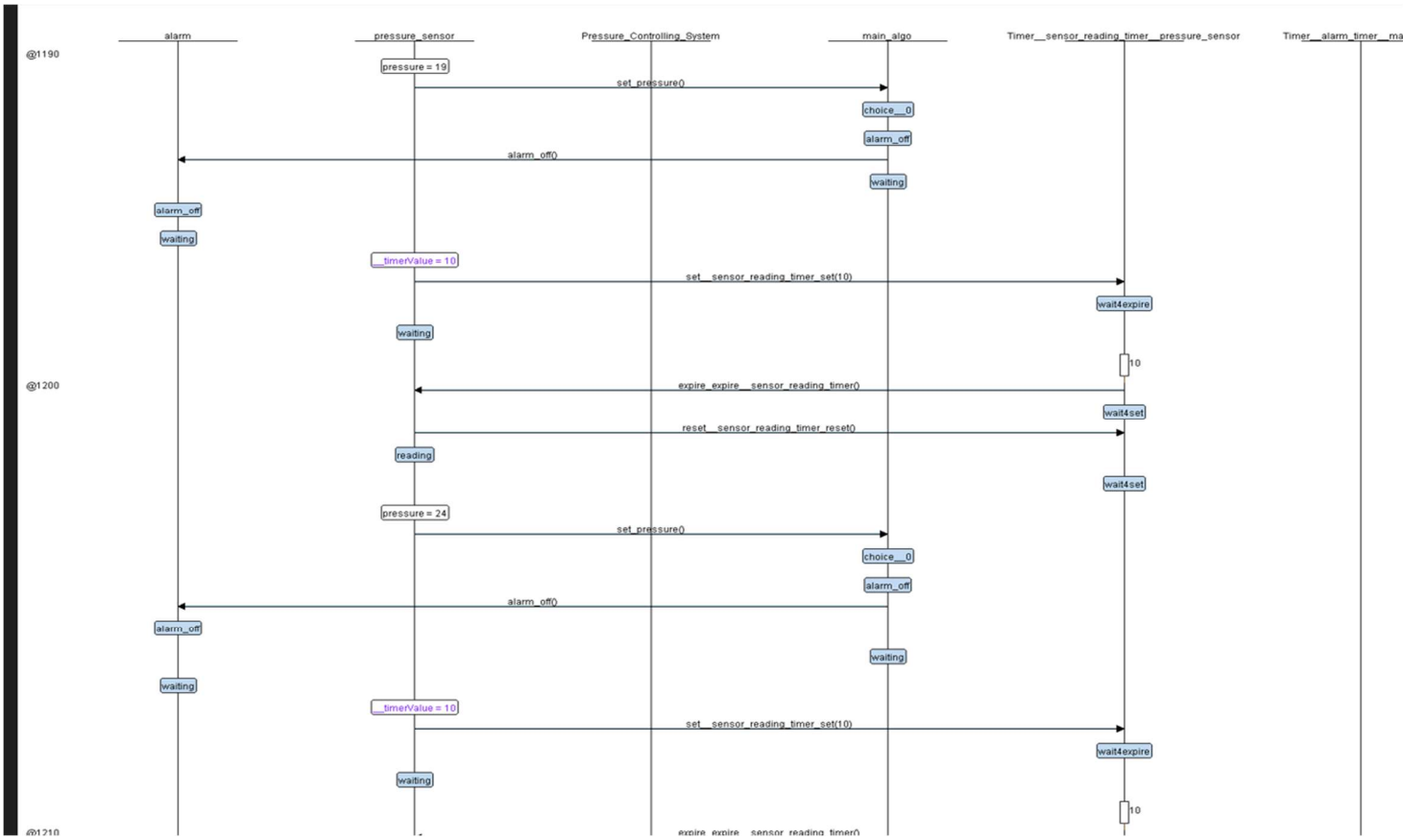
Pressure sensor



Alarm system



Interactive simulation



¬ Symbols ,sections for final executable file

```
HP@DESKTOP-6S2UROF MINGW64 /e/Mastering_embeded_sytem/repo/Mastering_Embedded_Sy
stems/first_term_project/Pressure Controller (main)
$ arm-none-eabi-nm.exe pressure_controller.elf
20001004 B _STACK_TOP
08000044 T Alarm_delay
0800001c T Alarm_init
08000036 T Alarm_Off
08000028 T Alarm_On
08000180 W Bus_Fault
08000180 T Default_Handler
08000058 T Delay
20000004 B E_BSS
20000004 D E_DATA
08000200 T E_TEXT
08000170 T get_pressure
08000078 T getPressureVal
080000cc T GPIO_INITIALIZATION
08000180 W H_Fault_Handler
0800011c T main
08000180 W MM_Fault_Handler
08000180 W NMI_Handler
08000180 W Reset_Handler
20000004 B S_BSS
20000000 D S_DATA
08000000 T S_TEXT
0800015c T sensor_delay
08000150 T Sensor_init
08000090 T Set_Alarm_actuator
20000000 D threshord_
08000180 W Usage_Fault_Handler
08000000 T vectors
```

------Alarm Driver object file sections , Symbols

```
stems/first_term_project/Pressure Controller (main)
$ arm-none-eabi-nm.exe  alarm.o
00000028 T Alarm_delay
00000000 T Alarm_init
0000001a T Alarm_Off
0000000c T Alarm_On
         U Delay
         U Set_Alarm_actuator
```

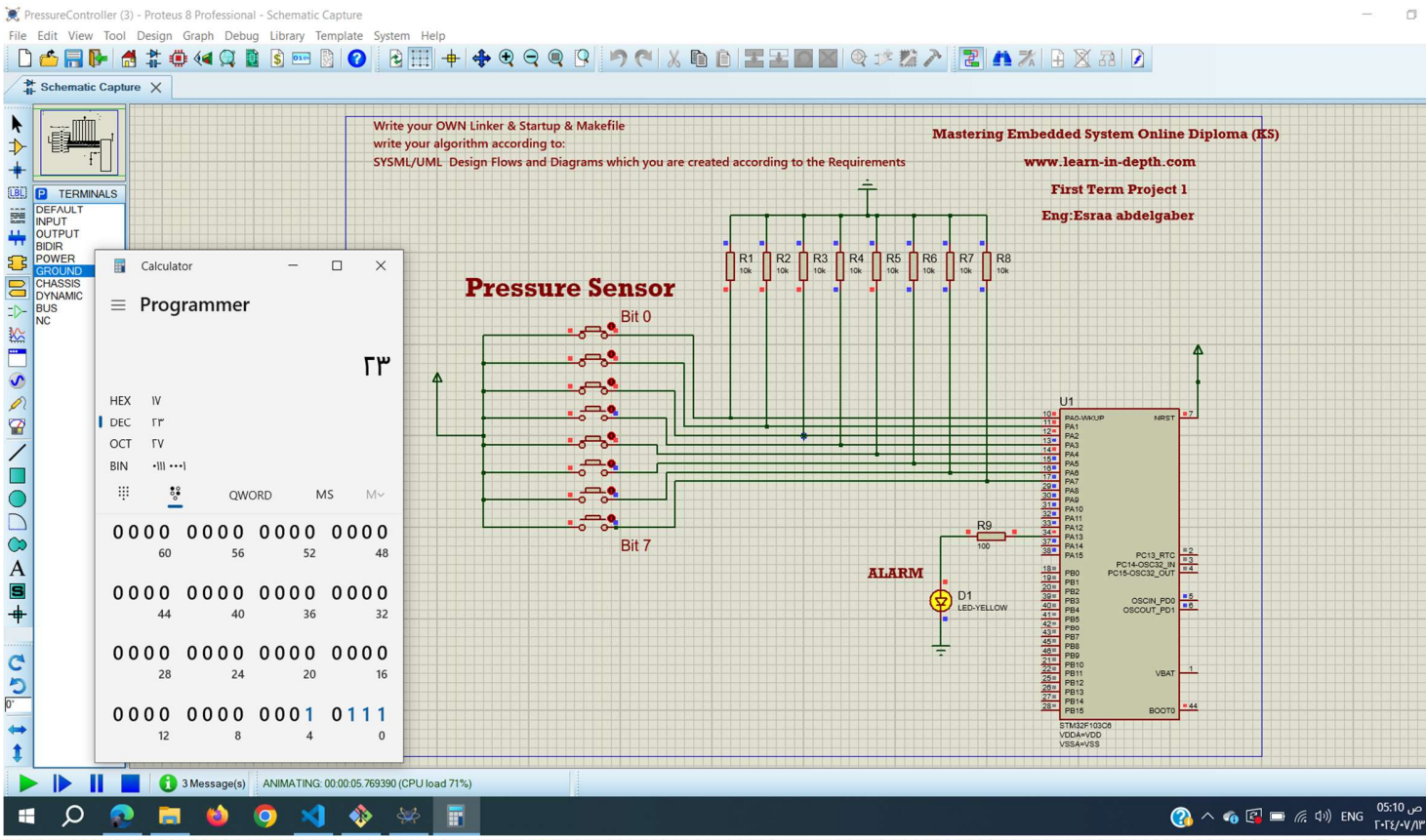
```
stems/first_term_project/Pressure Controller (main)
$ arm-none-eabi-objdump.exe -h alarm.o

alarm.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         0000003c  00000000  00000000  00000034  2**2
                  CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE
  1 .data         00000000  00000000  00000000  00000070  2**0
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  00000070  2**0
                  ALLOC
  3 .debug_info   000009c9  00000000  00000000  00000070  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  4 .debug_abbrev 00000176  00000000  00000000  00000a39  2**0
                  CONTENTS, READONLY, DEBUGGING
  5 .debug_loc    000000b0  00000000  00000000  00000baf  2**0
                  CONTENTS, READONLY, DEBUGGING
  6 .debug_aranges 00000020  00000000  00000000  00000c5f  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  7 .debug_line   00000127  00000000  00000000  00000c7f  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  8 .debug_str    00000570  00000000  00000000  00000da6  2**0
                  CONTENTS, READONLY, DEBUGGING
  9 .comment      0000007f  00000000  00000000  00001316  2**0
                  CONTENTS, READONLY
 10 .debug_frame  00000080  00000000  00000000  00001398  2**2
                  CONTENTS, RELOC, READONLY, DEBUGGING
 11 .ARM.attributes 00000033  00000000  00000000  00001418  2**0
                  CONTENTS, READONLY
```

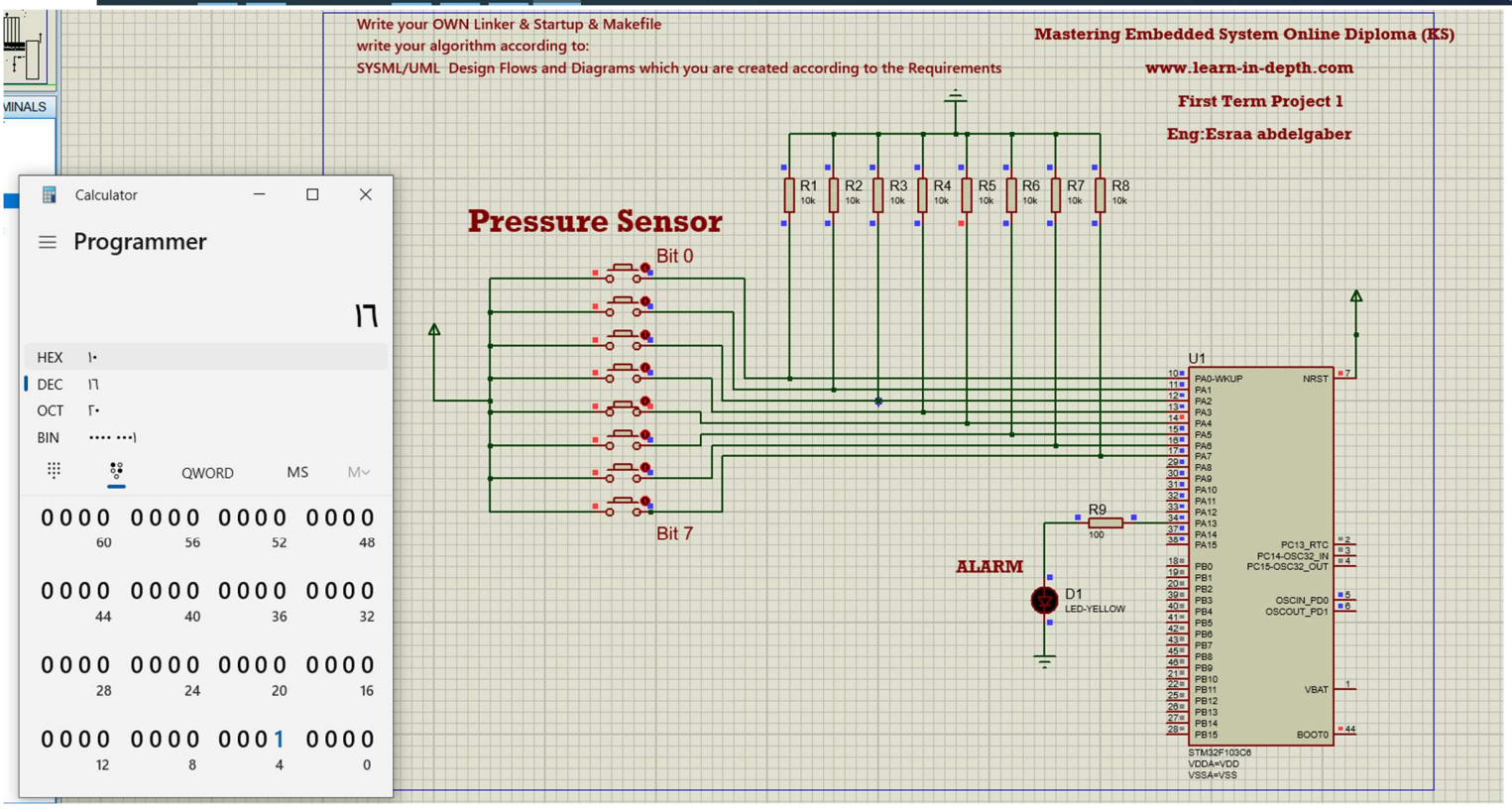
------sensor Driver and main object file sections , Symbols

```
HP@DESKTOP-6S2UROF MINGW64 /e/Mastering_embeded_sytem/repo/Mastering_Embedded_Sy
stems/first_term_project/Pressure Controller (main)
$ arm-none-eabi-nm.exe  sensor.o
         U Delay
00000020 T get_pressure
         U getPressureVal
0000000c T sensor_delay
00000000 T Sensor_init

HP@DESKTOP-6S2UROF MINGW64 /e/Mastering_embeded_sytem/repo/Mastering_Embedded_Sy
stems/first_term_project/Pressure Controller (main)
$ arm-none-eabi-nm.exe  main.o
         U Alarm_delay
         U Alarm_Off
         U Alarm_On
         U get_pressure
         U GPIO_INITIALIZATION
00000000 T main
         U sensor_delay
00000000 D threshord_
```

```
HP@DESKTOP-6S2UROF MINGW64 /e/Mastering_embeded_sytem/repo/Mastering_Embedded_Systems/first_term_project/Pressure Controller (main)
$ 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         00000034  00000000  00000000  00000034  2**2
                  CONTENTS, ALLOC, LOAD, RELOC, READONLY, CODE
  1 .data         00000004  00000000  00000000  00000068  2**2
                  CONTENTS, ALLOC, LOAD, DATA
  2 .bss          00000000  00000000  00000000  0000006c  2**0
                  ALLOC
  3 .debug_info   000009c8  00000000  00000000  0000006c  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  4 .debug_abbrev 000001a8  00000000  00000000  00000a34  2**0
                  CONTENTS, READONLY, DEBUGGING
  5 .debug_loc    00000038  00000000  00000000  00000bdc  2**0
                  CONTENTS, READONLY, DEBUGGING
  6 .debug_aranges 00000020  00000000  00000000  00000c14  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  7 .debug_line   00000125  00000000  00000000  00000c34  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  8 .debug_str    0000055e  00000000  00000000  00000d59  2**0
                  CONTENTS, READONLY, DEBUGGING
  9 .comment      0000007f  00000000  00000000  000012b7  2**0
                  CONTENTS, READONLY
 10 .debug_frame  00000030  00000000  00000000  00001338  2**2
                  CONTENTS, RELOC, READONLY, DEBUGGING
 11 .ARM.attributes 00000033  00000000  00000000  00001368  2**0
                  CONTENTS, READONLY
```

```
$ arm-none-eabi-objdump.exe -h sensor.o

sensor.o:     file format elf32-littlearm

Sections:
Idx Name          Size      VMA       LMA       File off  Algn
  0 .text         00000030  00000000  00000000  00000034  2**2
                  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   000009b8  00000000  00000000  00000064  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  4 .debug_abbrev 000001a4  00000000  00000000  00000a1c  2**0
                  CONTENTS, READONLY, DEBUGGING
  5 .debug_loc    0000009c  00000000  00000000  00000bc0  2**0
                  CONTENTS, READONLY, DEBUGGING
  6 .debug_aranges 00000020  00000000  00000000  00000c5c  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  7 .debug_line   00000124  00000000  00000000  00000c7c  2**0
                  CONTENTS, RELOC, READONLY, DEBUGGING
  8 .debug_str    0000056d  00000000  00000000  00000da0  2**0
                  CONTENTS, READONLY, DEBUGGING
  9 .comment      0000007f  00000000  00000000  0000130d  2**0
                  CONTENTS, READONLY
 10 .debug_frame  00000068  00000000  00000000  0000138c  2**2
                  CONTENTS, RELOC, READONLY, DEBUGGING
 11 .ARM.attributes 00000033  00000000  00000000  000013f4  2**0
                  CONTENTS, READONLY
```


PressureController (3) - Proteus 8 Professional - Schematic Capture
File Edit View Tool Design Graph Debug Library Template System Help
Schematic Capture
TERMINALS
DEFAULT
INPUT
OUTPUT
BIDIR
POWER
GROUND
CHASSIS
DYNAMIC
BUS
NC
Write your OWN Linker & Startup & Makefile
write your algorithm according to:
SYSML/UML Design Flows and Diagrams which you are created according to the Requirements
Mastering Embedded System Online Diploma (KS)
www.learn-in-depth.com
First Term Project 1
Eng:Esraa abdelgaber
Pressure Sensor
Bit 0
Bit 7
R1 10k
R2 10k
R3 10k
R4 10k
R5 10k
R6 10k
R7 10k
R8 10k
R9 100
ALARM
D1 LED-YELLOW
U1
STM32F103C6
VDDA=VDD
VSSA=VSS
Calculator
Programmer
٢٣
HEX ١٧
DEC ٢٣
OCT ٢٧
BIN ••|||
QWORD MS
0000 0000 0000 0000
60 56 52 48
0000 0000 0000 0000
44 40 36 32
0000 0000 0000 0000
28 24 20 16
0000 0000 0001 0111
12 8 4 0
3 Message(s)
ANIMATING: 00:00:05.769390 (CPU load 71%)
ENG
05:10 ص
٢٠٢٤/٠٧/١٣


Write your OWN Linker & Startup & Makefile
write your algorithm according to:
SYSML/UML Design Flows and Diagrams which you are created according to the Requirements
Mastering Embedded System Online Diploma (KS)
www.learn-in-depth.com
First Term Project 1
Eng:Esraa abdelgaber
Pressure Sensor
Bit 0
Bit 7
R1 10k
R2 10k
R3 10k
R4 10k
R5 10k
R6 10k
R7 10k
R8 10k
R9 100
ALARM
D1 LED-YELLOW
U1
STM32F103C6
VDDA=VDD
VSSA=VSS
Calculator
Programmer
١٧
HEX ١٠
DEC ١٧
OCT ٢٠
BIN •••• •••|
QWORD MS
0000 0000 0000 0000
60 56 52 48
0000 0000 0000 0000
44 40 36 32
0000 0000 0000 0000
28 24 20 16
0000 0000 0001 0000
12 8 4 0