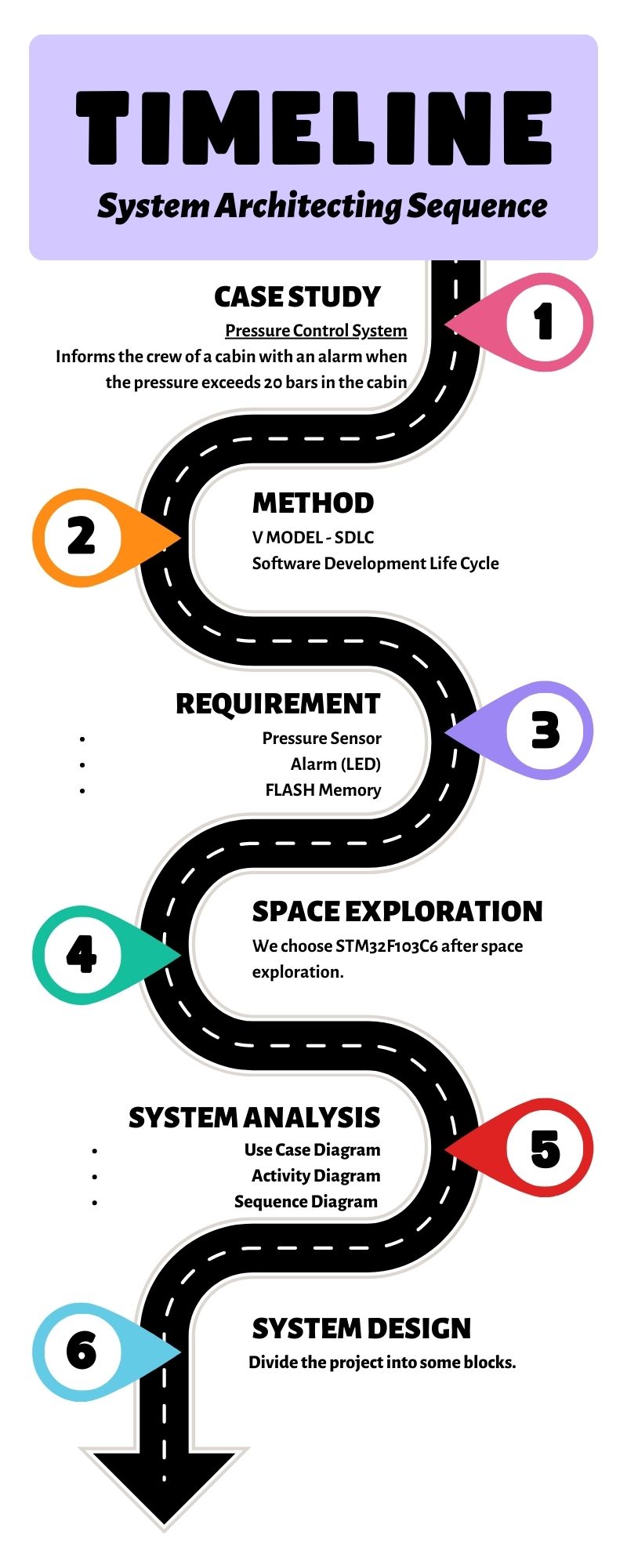


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**Pressure Detection System**

**A client expects you to deliver the software of the following system:**

**Specification (from the client):**

* 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.
* Keeps track of the measured values.

**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.

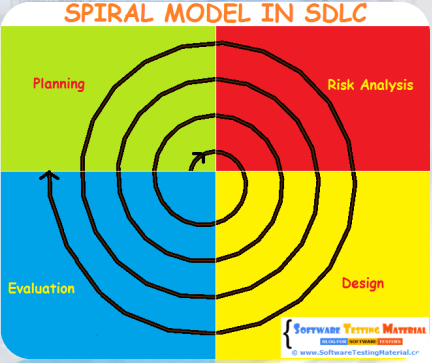


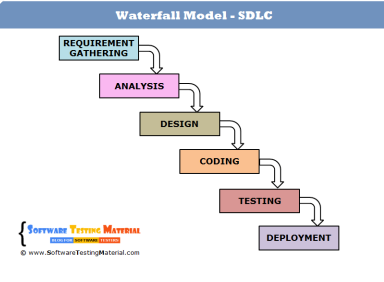
**Version 1.0:**

The keep track of measured value option is not modeled in the first version of the design.

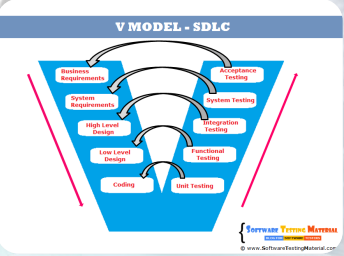
**There are different methods like as:**

* V Model-SDLC
* Waterfall Model-SDLC
* SPIRAL Model-SDLC

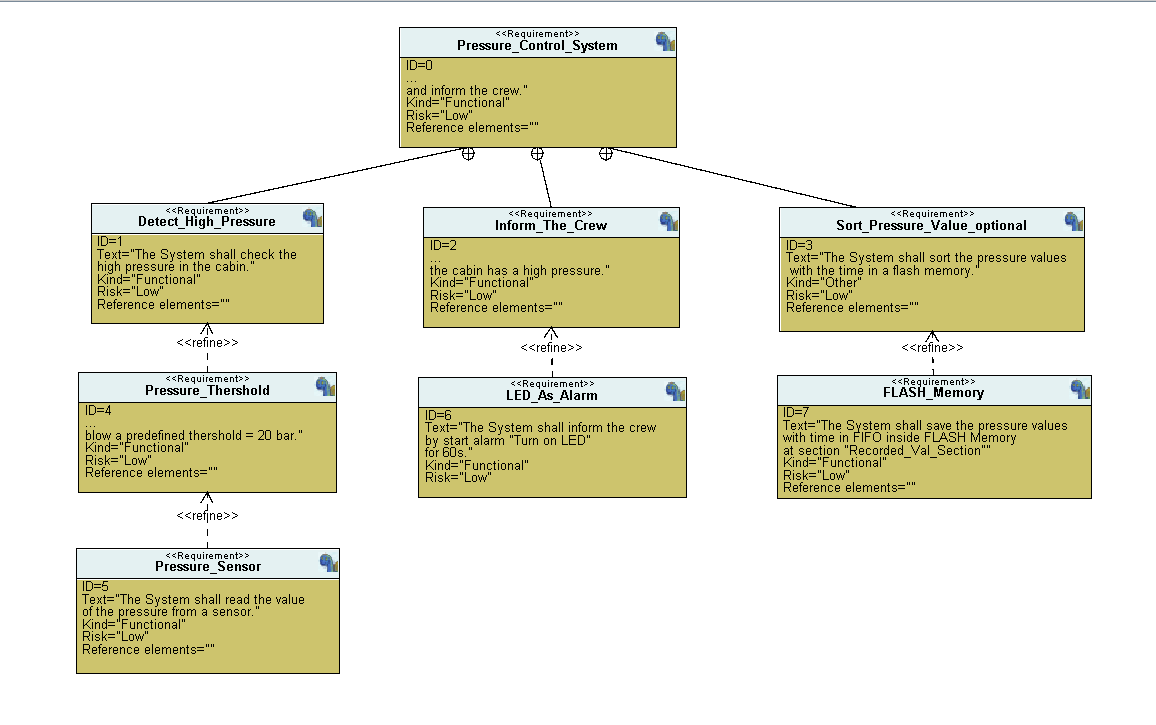


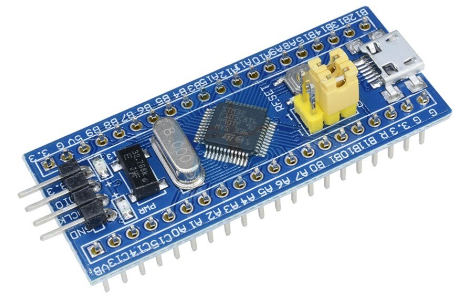


We will use **V Model-SDLC**



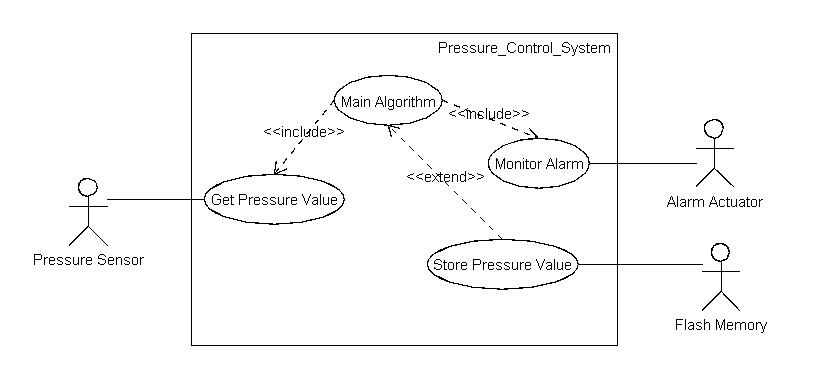
**SDLC** is Software Development Life Cycle.

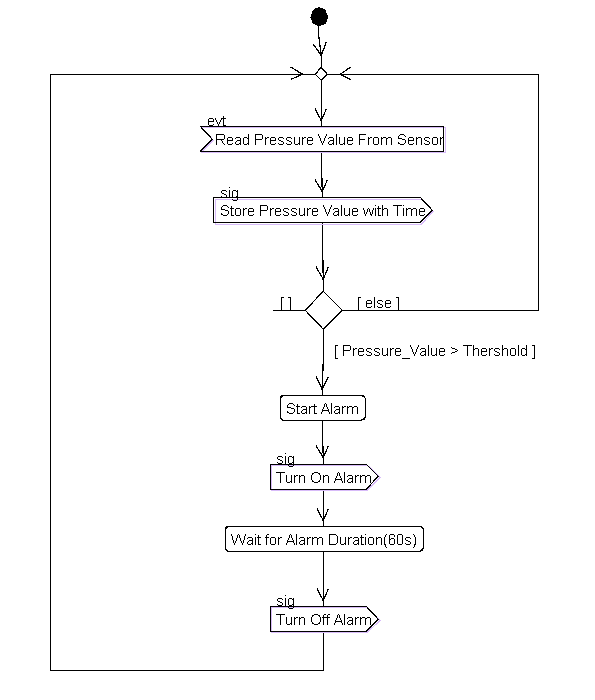


  
After space exploration we will use:

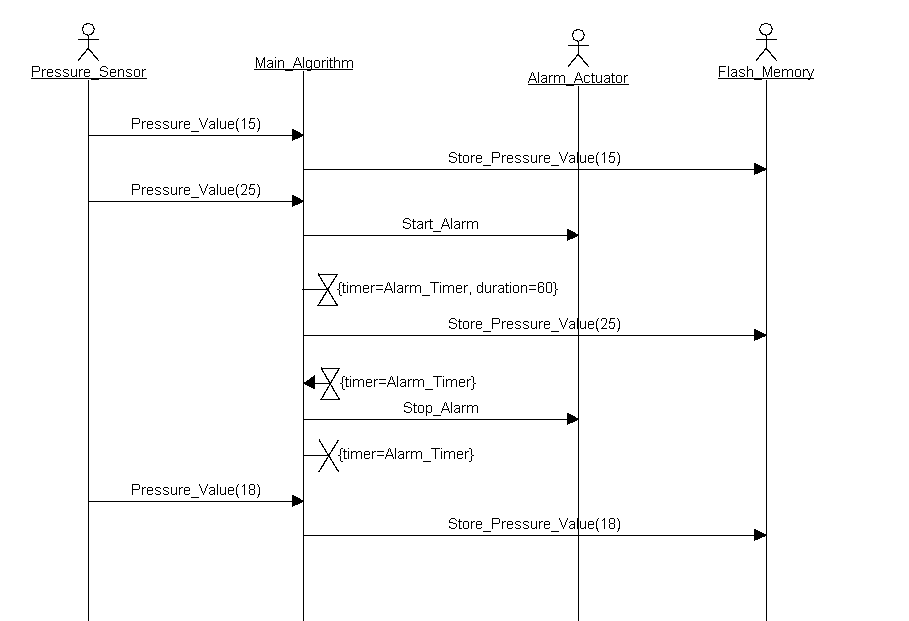
**Microcontroller:** STM32F10C6

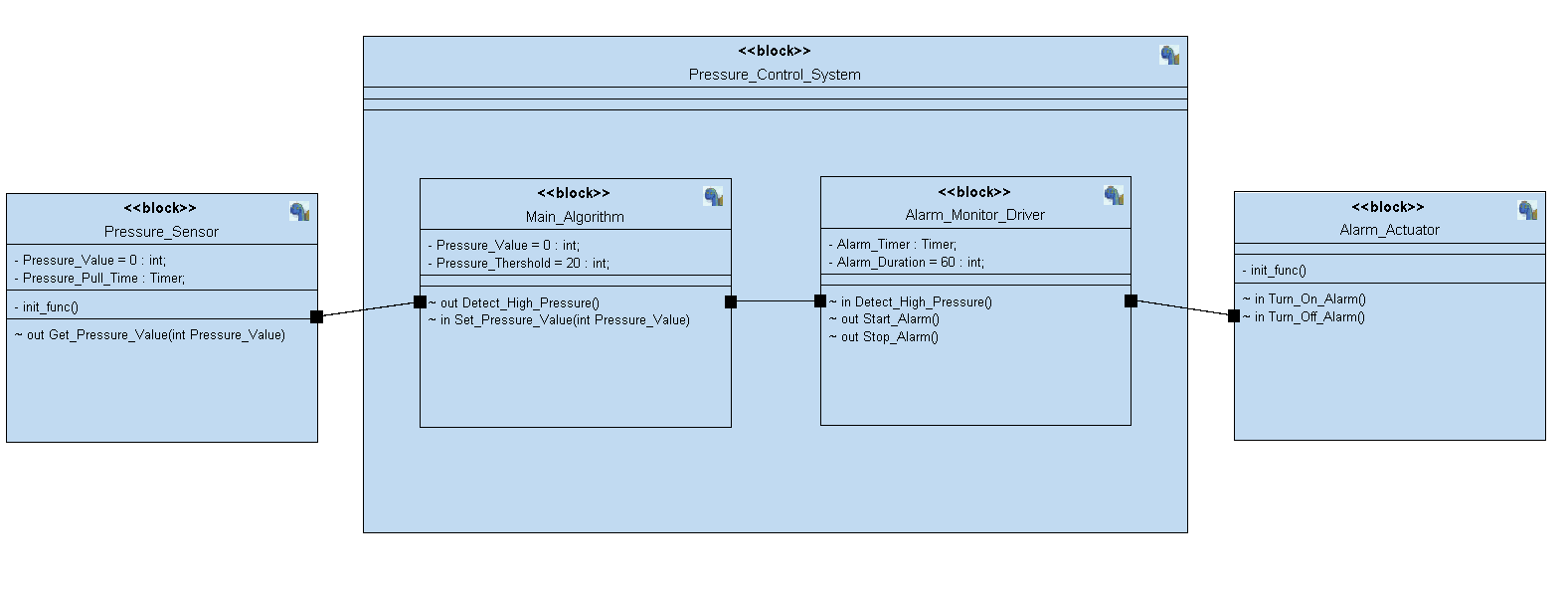
**Processor:** Arm-Cortex-M3

It will obtain System boundary and Main functions.

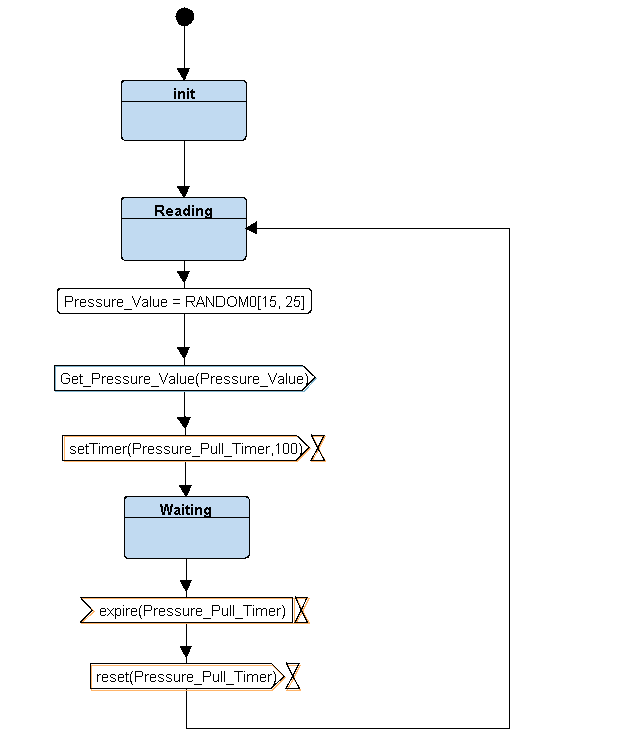
It’s used to describe the workflow behavior of a system.

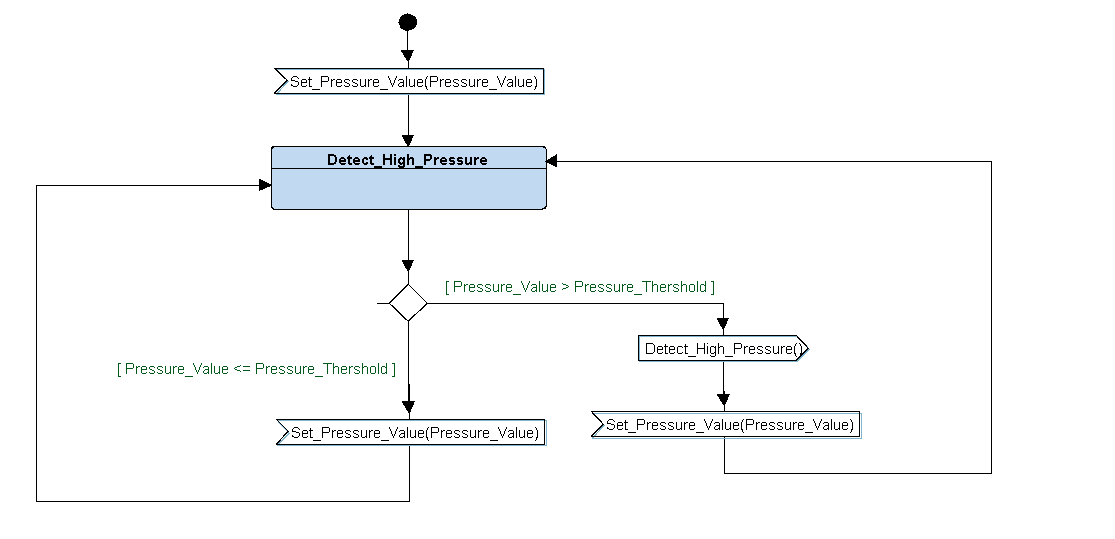
**A sequence diagram is:**

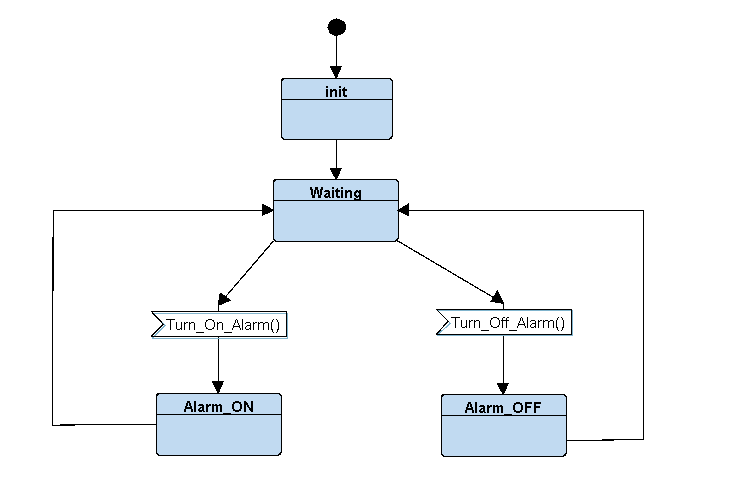
* An interaction diagram that details how operations are carried out.
* What messages are sent and when.
* Is organized according to time.

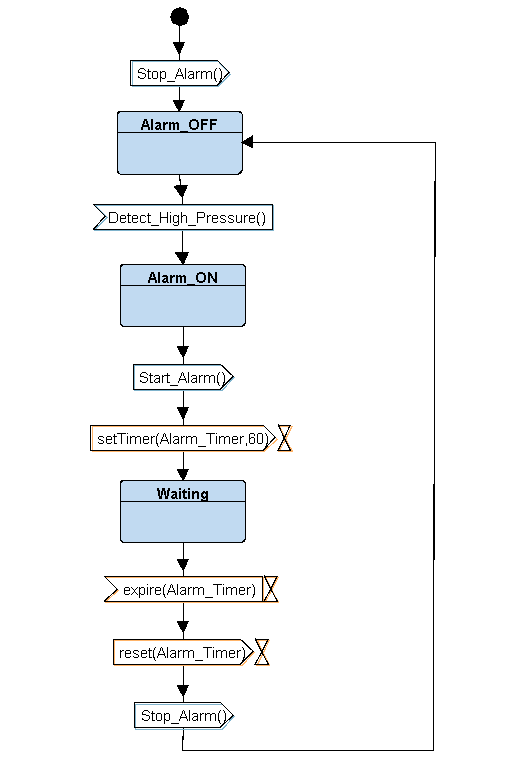


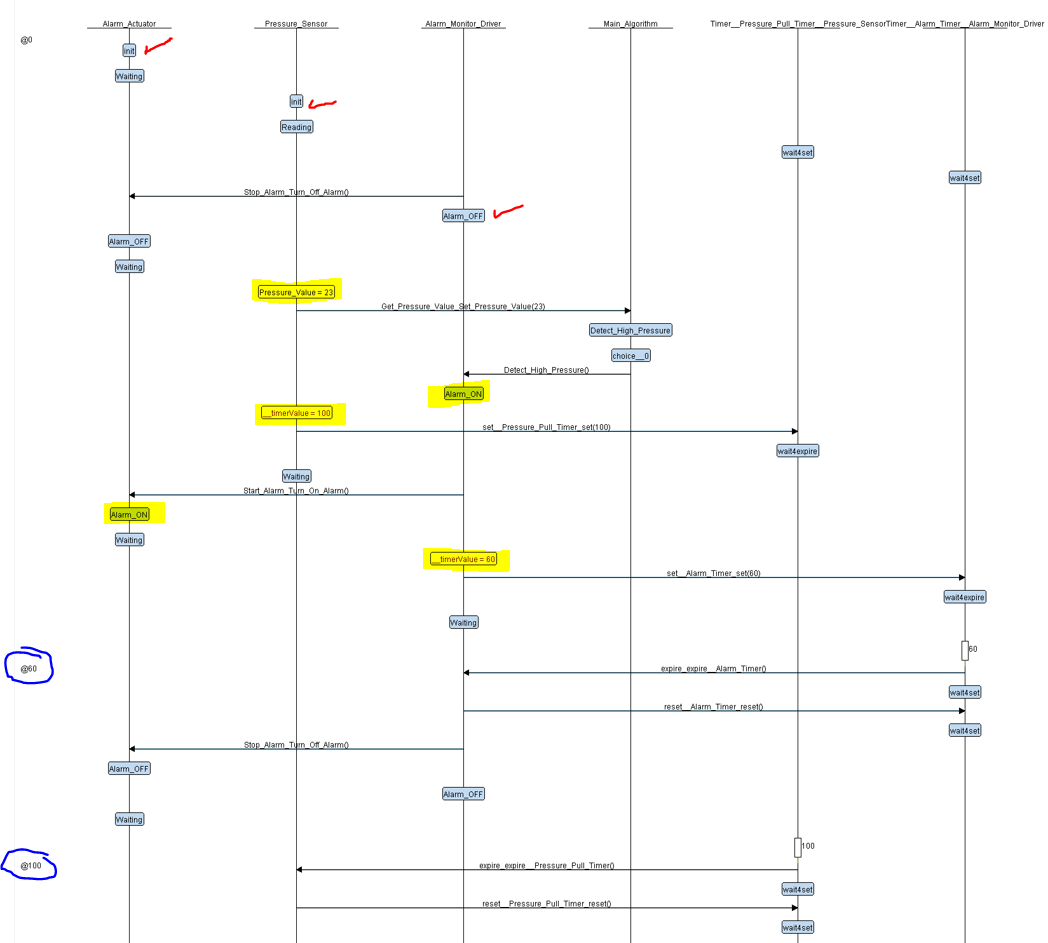
**State Machine for each block:**

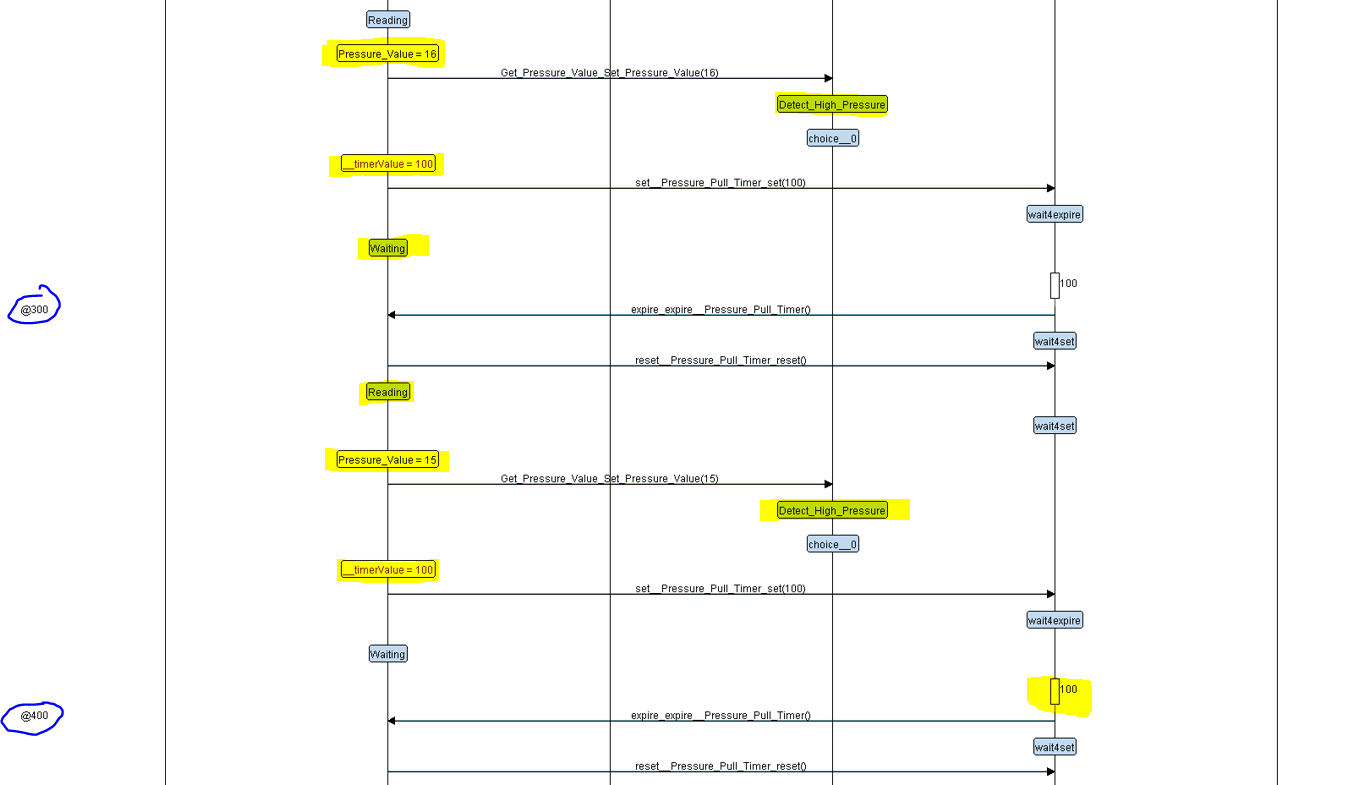
 **Pressure Sensor**

 **Main Algorithm**

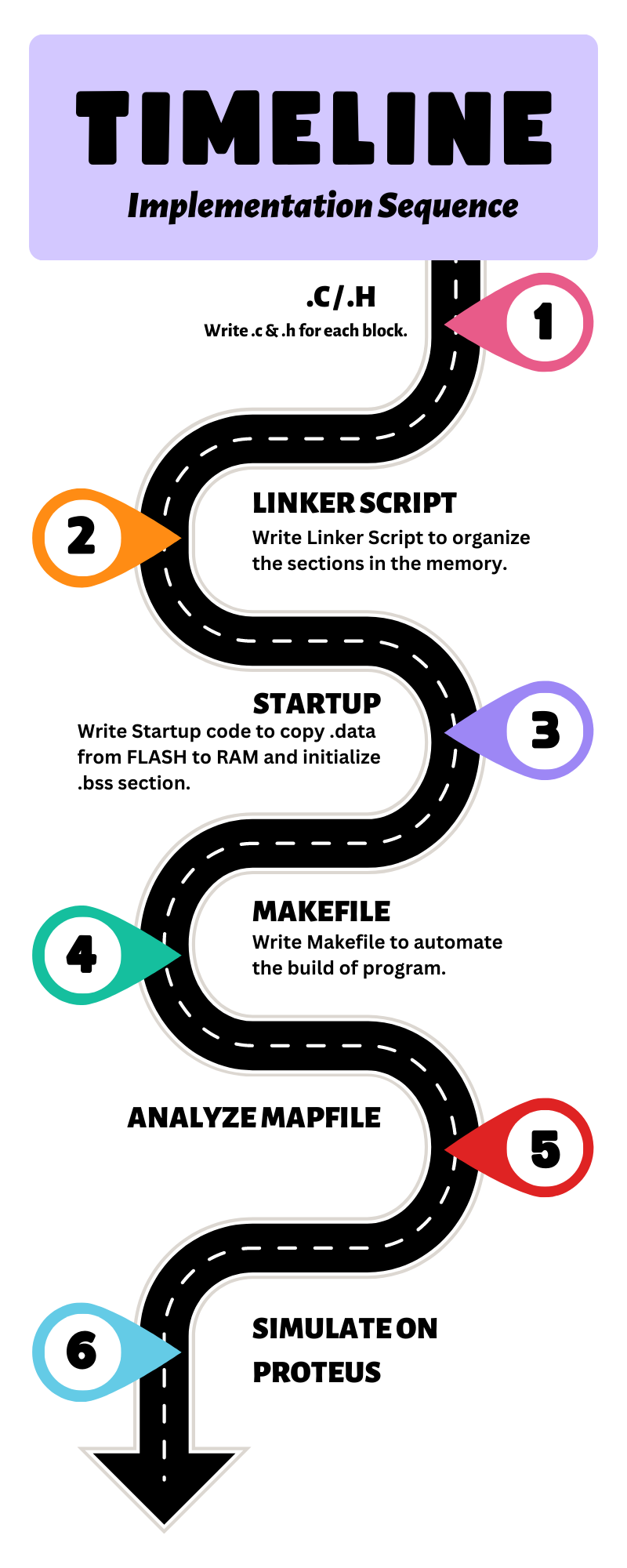
 **Alarm Actuator**

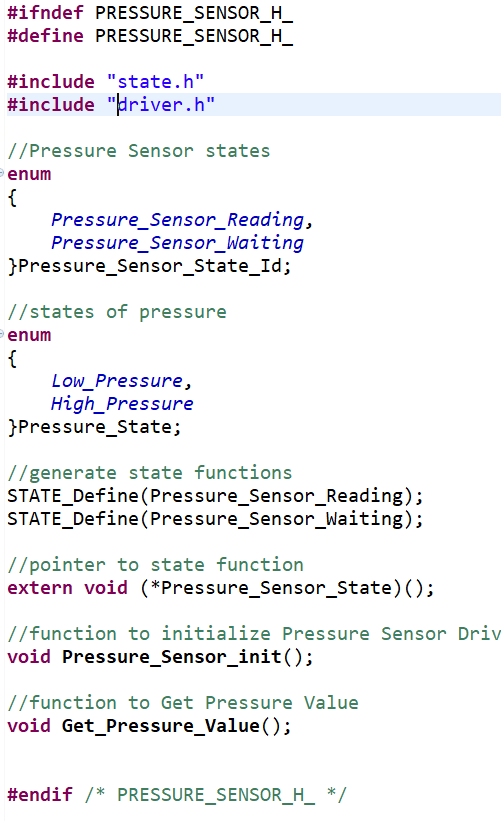
 **Alarm Monitor Driver**

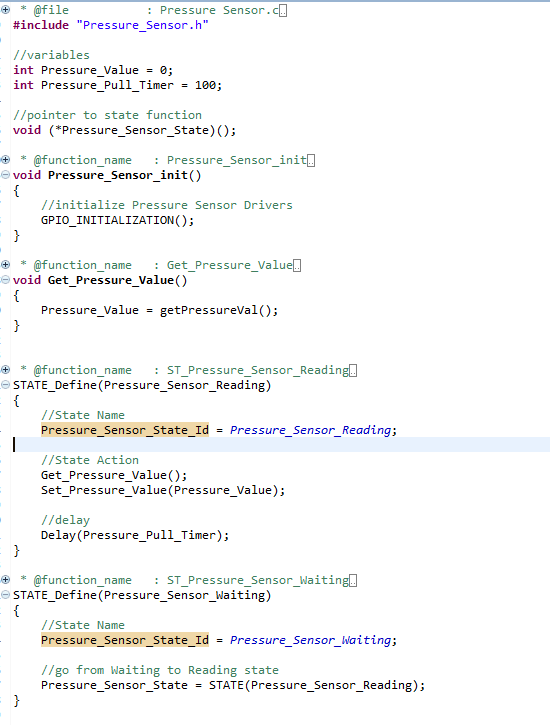
**Interactive Simulation State when pressure is bigger than 20:**

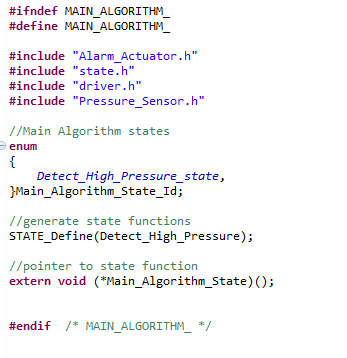
**Interactive Simulation State when pressure is smaller than 20:**

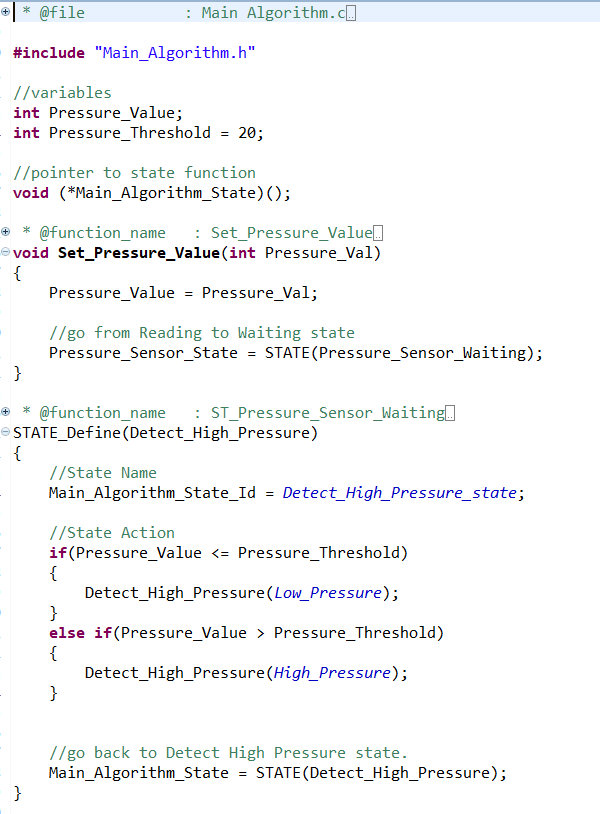
The Alarm is not turn on and we don’t use the timer of it because the pressure sensor read values less than 20 bar.

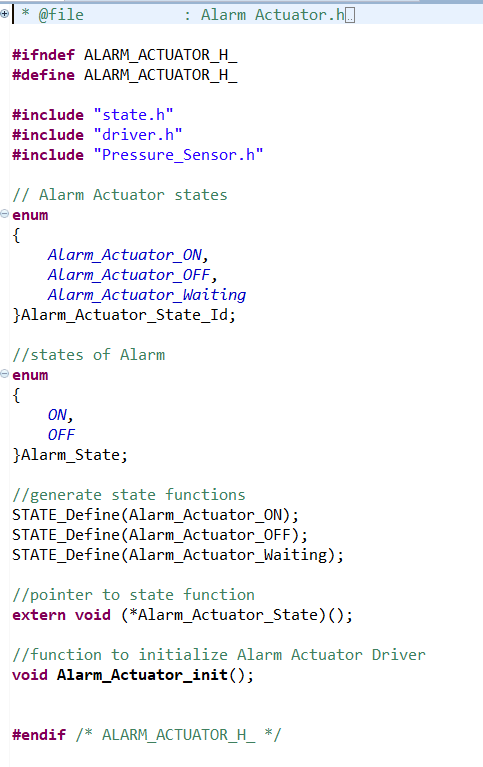


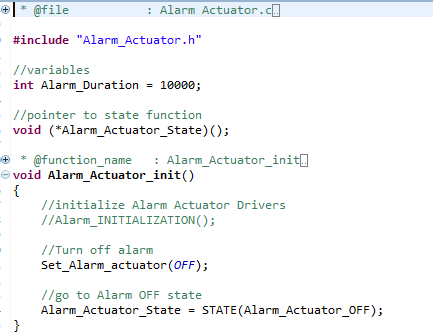


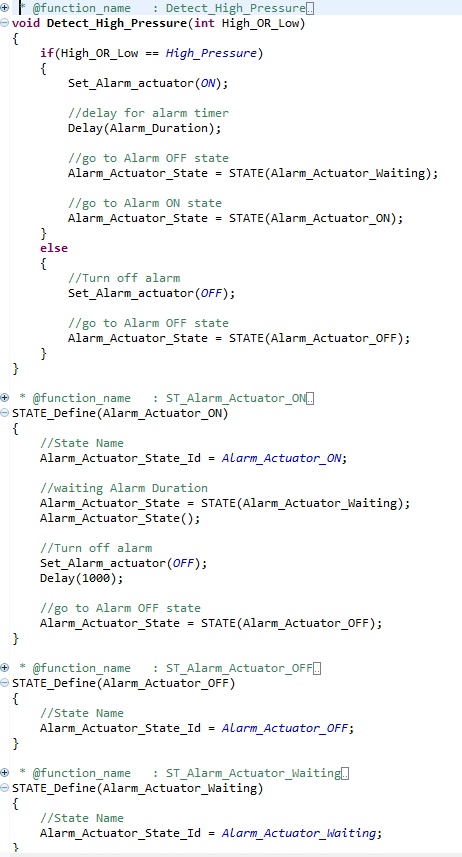


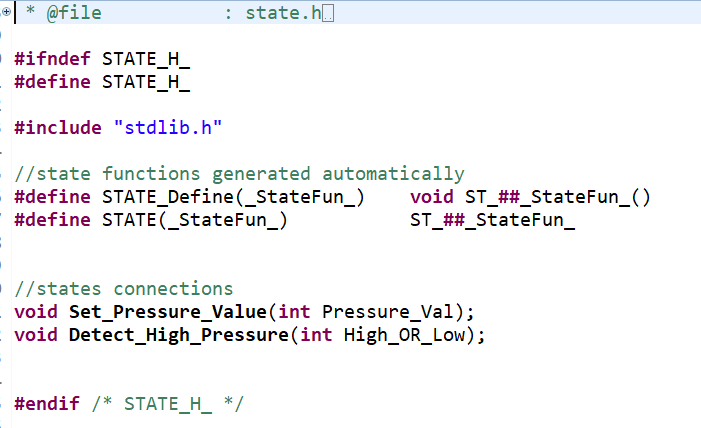


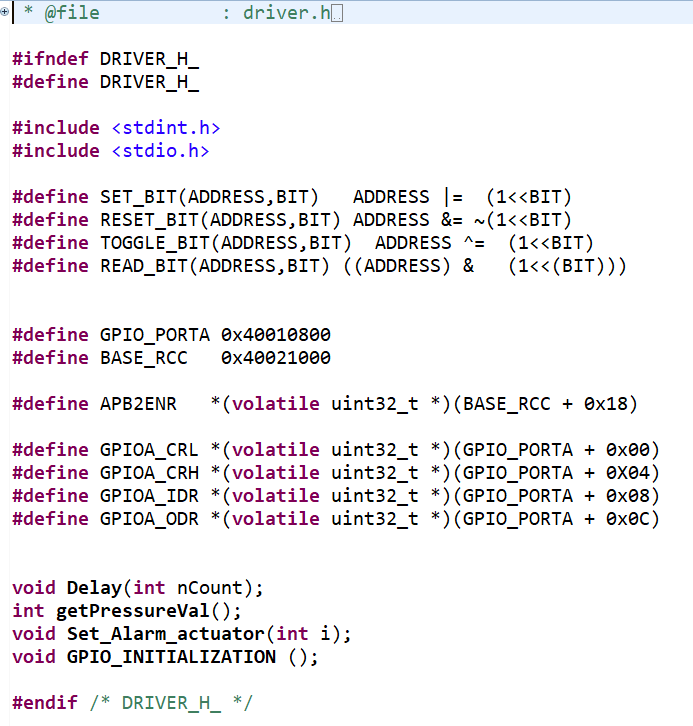


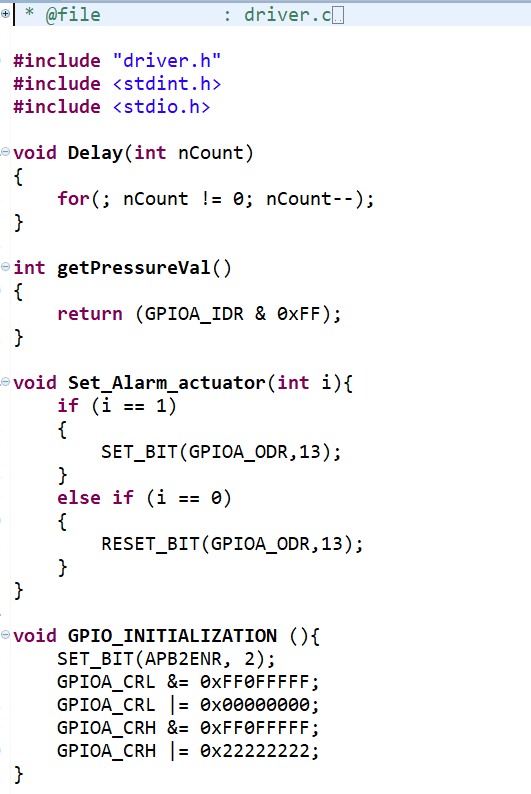


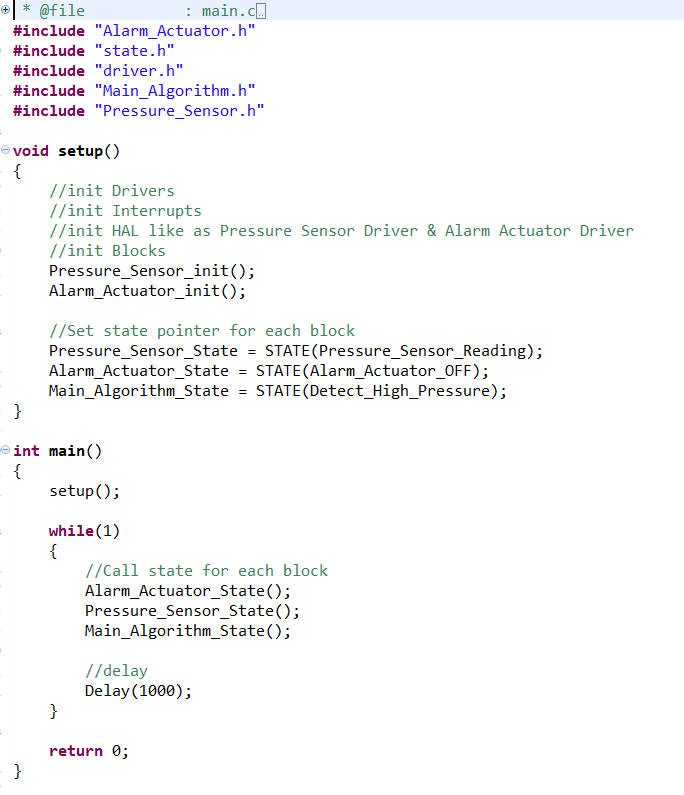


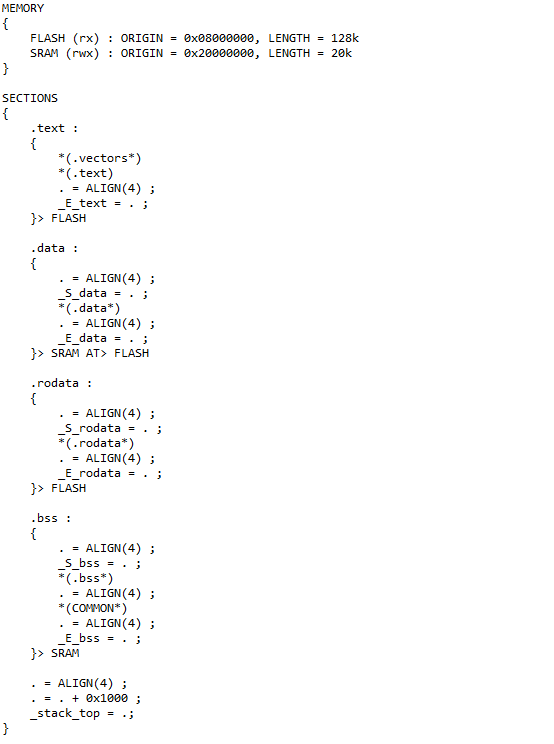


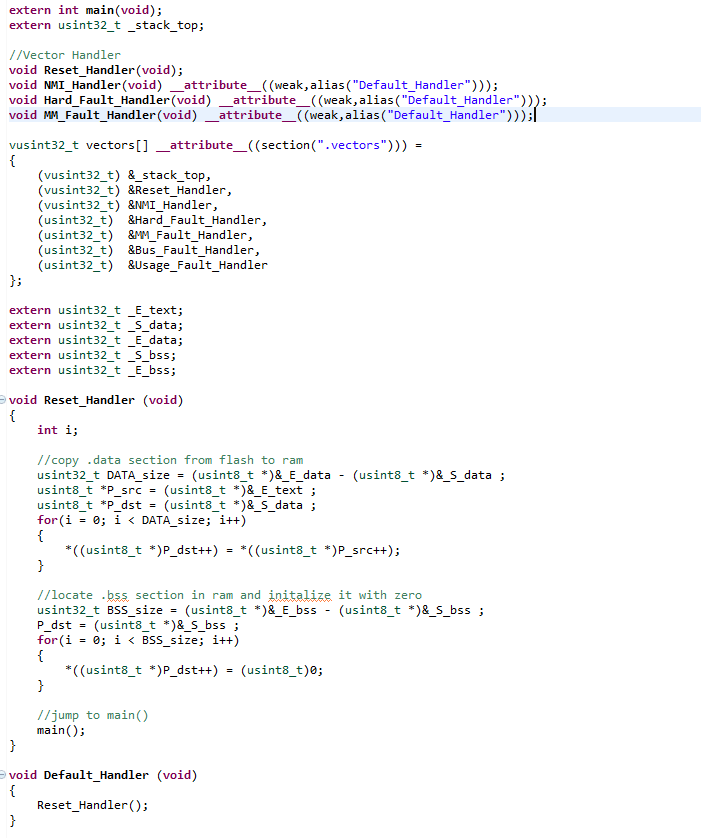


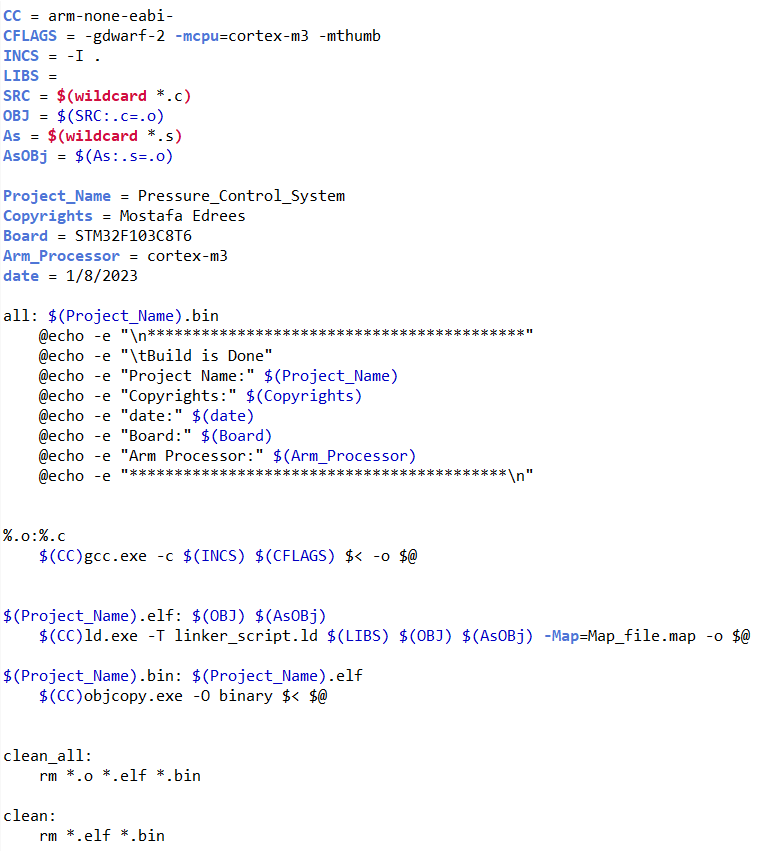


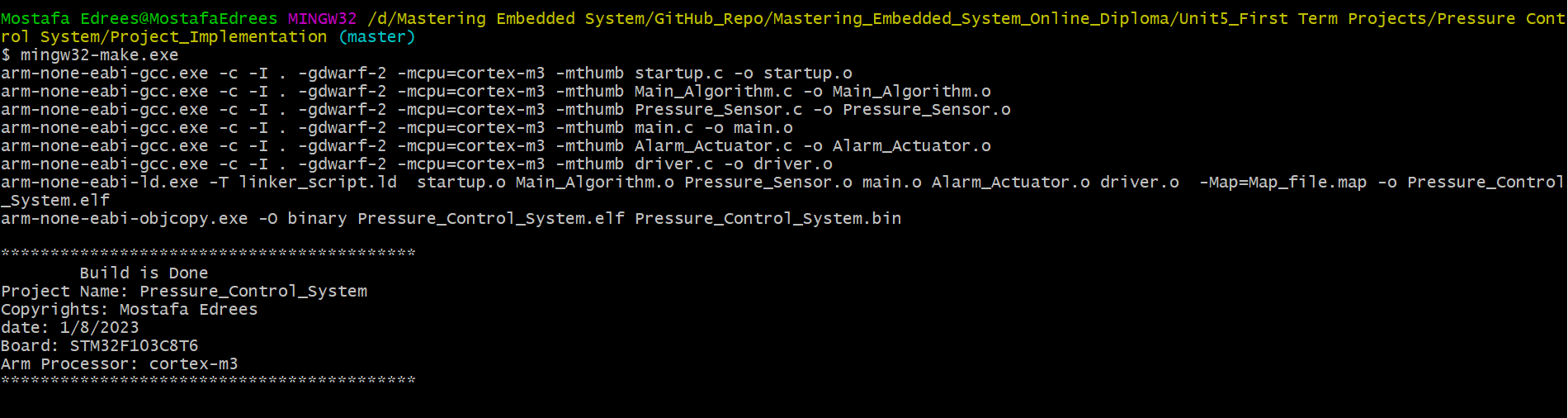






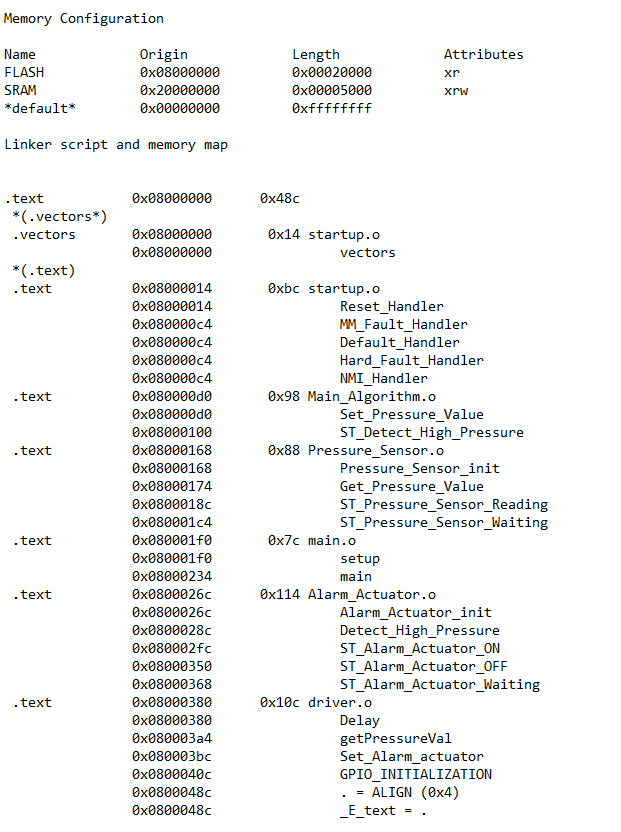


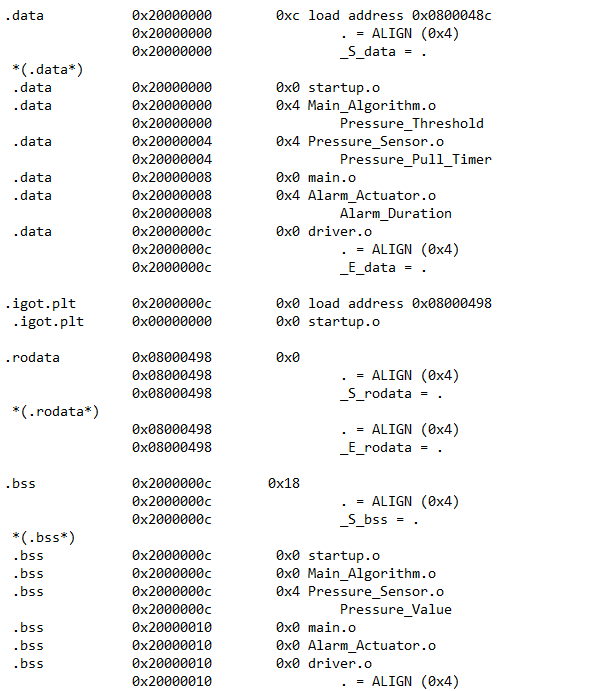


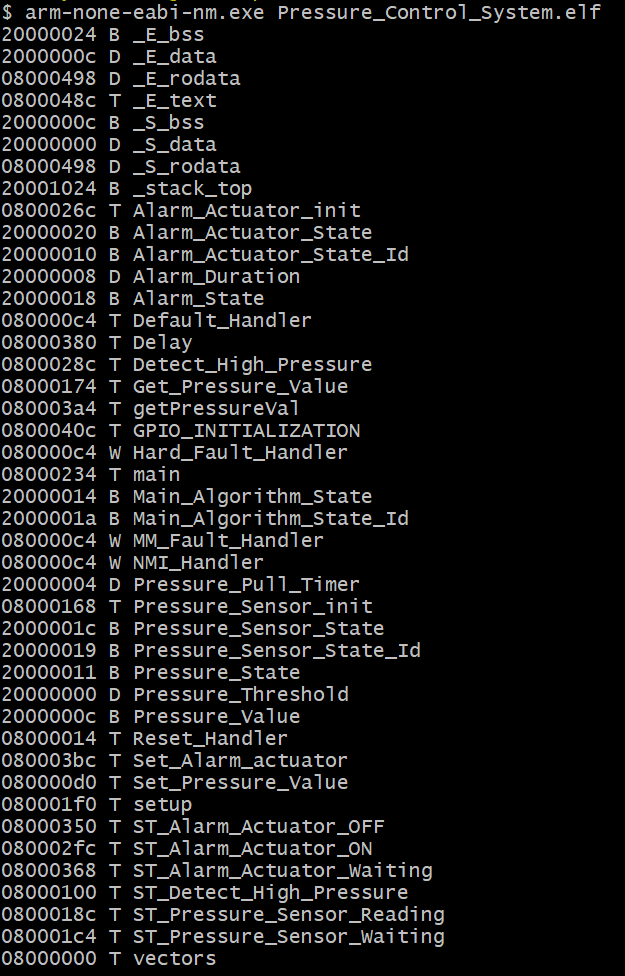
**Build the project by using Makefile:**

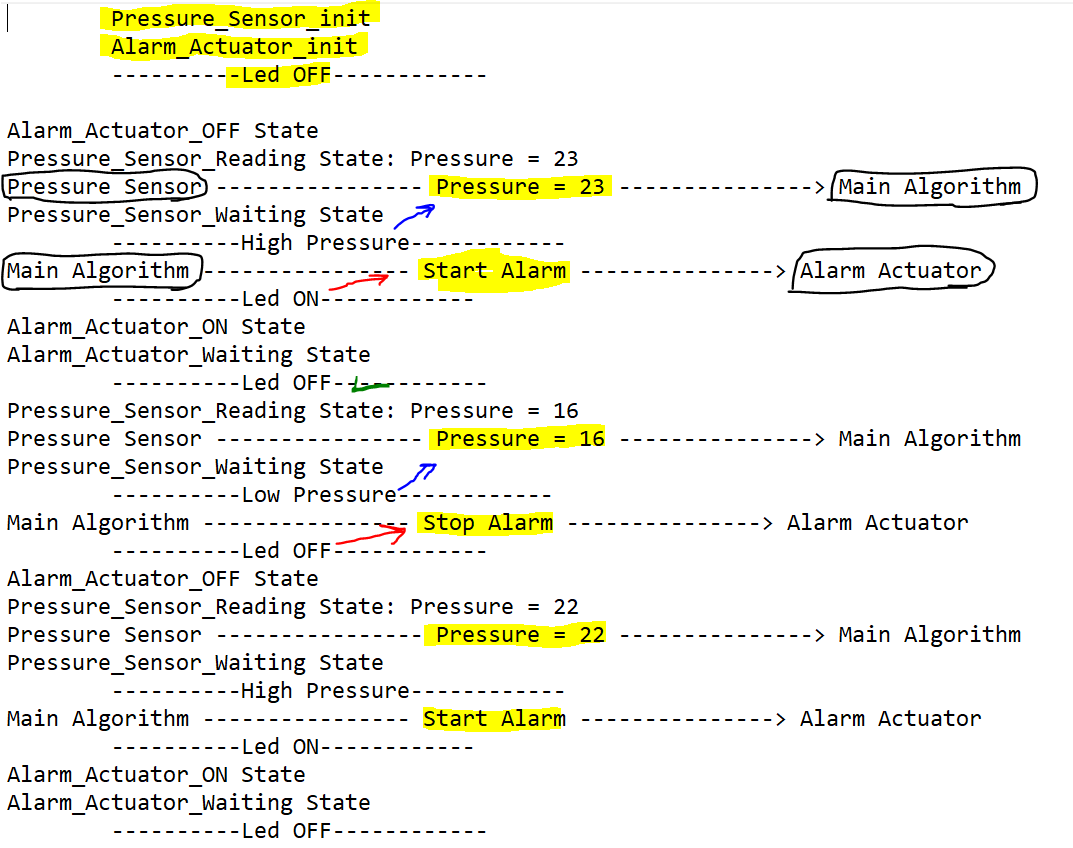
**Link of GitHub Repository:**

[GitHub](https://github.com/MostafaEdrees11/Mastering_Embedded_System_Online_Diploma/tree/master/Unit5_First%20Term%20Projects/Pressure%20Control%20System)





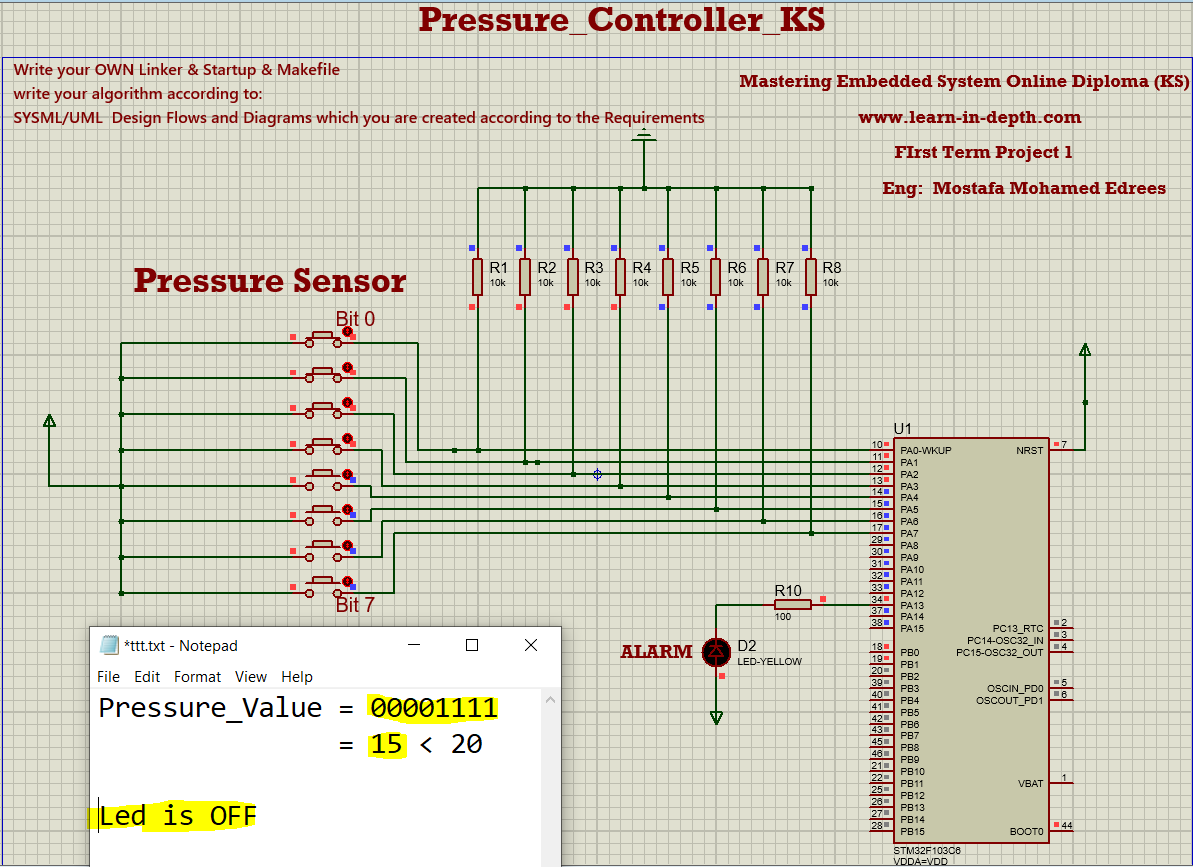
**Symbols Table of executable file:**



We will enter the pressure value by 8 switch buttons and these implement the binary number of pressure value.

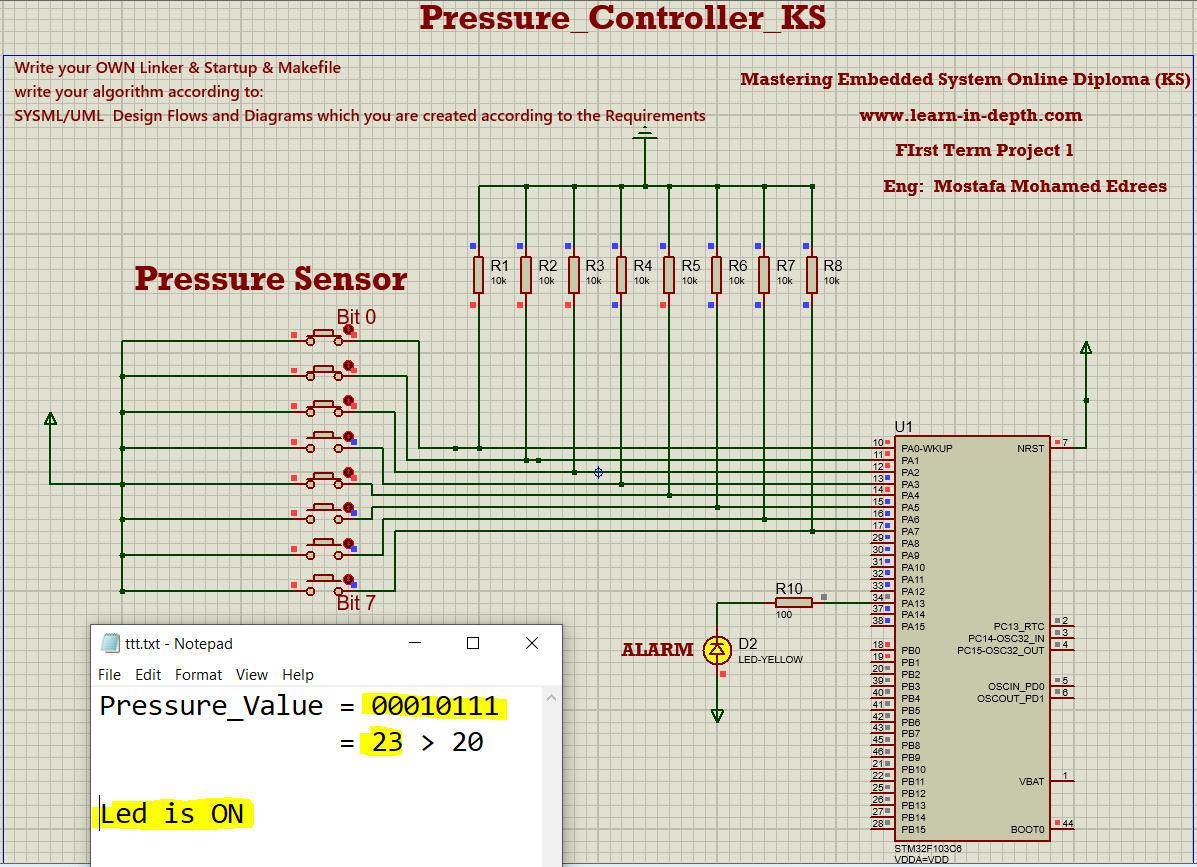
**Case1:**

The Pressure Value is less than Threshold (20).



**Case2:**

The Pressure Value is more than Threshold (20).



**You can see run of the project from here:**

[**Running Video**](https://drive.google.com/drive/u/2/folders/1-ubtekjkARF5dU45Q_bx7X0dgZyz0bcY)