Mastering Embedded System

Online Diploma

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First Term Project 1

High Pressure Detection System

BY :

Eng. Mohamed Kamel Aly

My Profile : No progess page created,

Email: mohamed.kamel.m73@gmail.com

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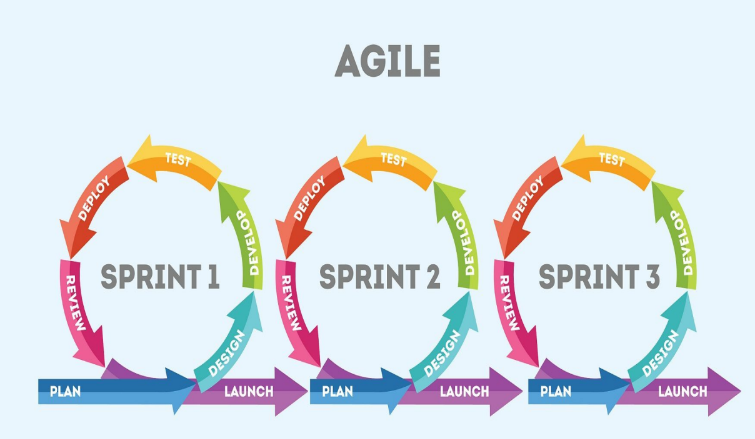
# Business Analysis (Case Study)

This case study describes a pressure detection system which lights an LED alarm when triggered:

1. A pressure sensor reads pressure values each 60 seconds
2. The system checks if the pressure is above a threshold of 20
3. If the pressure is above the threshold, an LED alarm is turned on
4. The alarm duration equals 60 seconds
5. Optional: the system keeps track of the measured pressure values.

# Methodology

Agile methodology is an iterative and incremental approach to software development that prioritizes flexibility, collaboration, and customer satisfaction. It emerged as a response to the shortcomings of traditional waterfall methodologies, which often resulted in lengthy development cycles and a lack of adaptability to changing requirements.



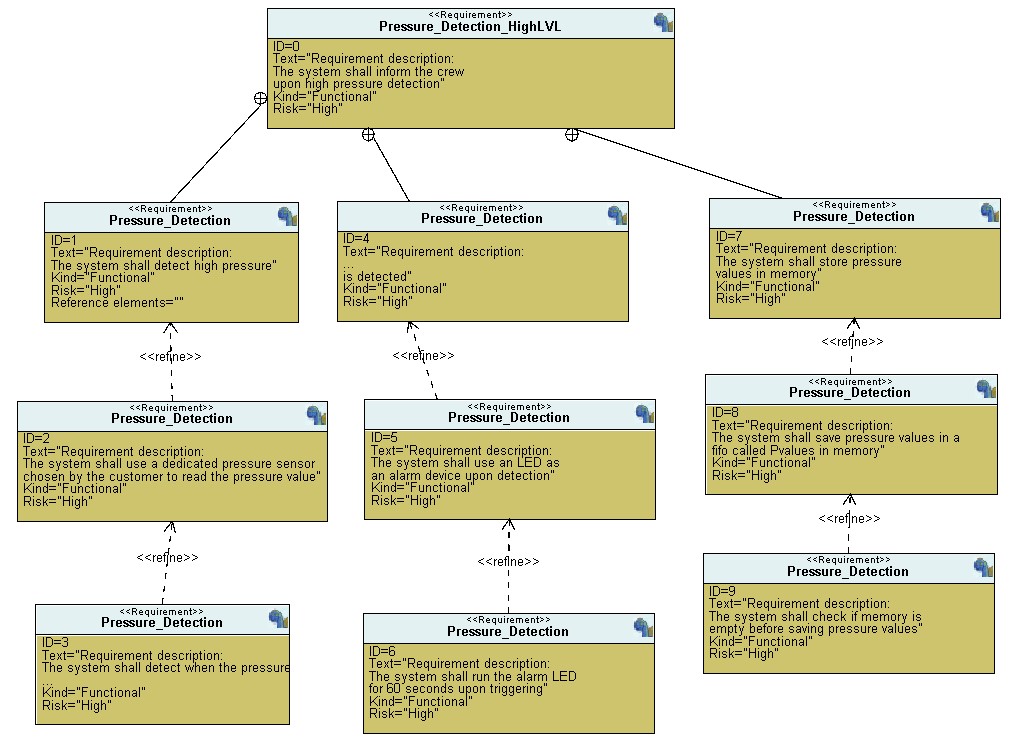
# Requirements

A ”client” expects 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

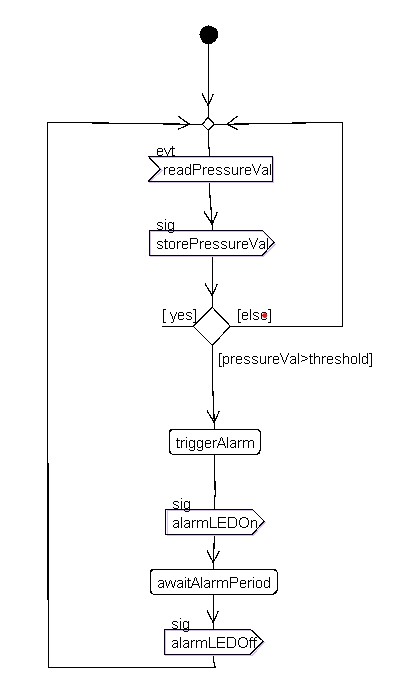
alarm duration equals 60 seconds.



# System Analysis

## Use Case Diagram

## Activity Diagram

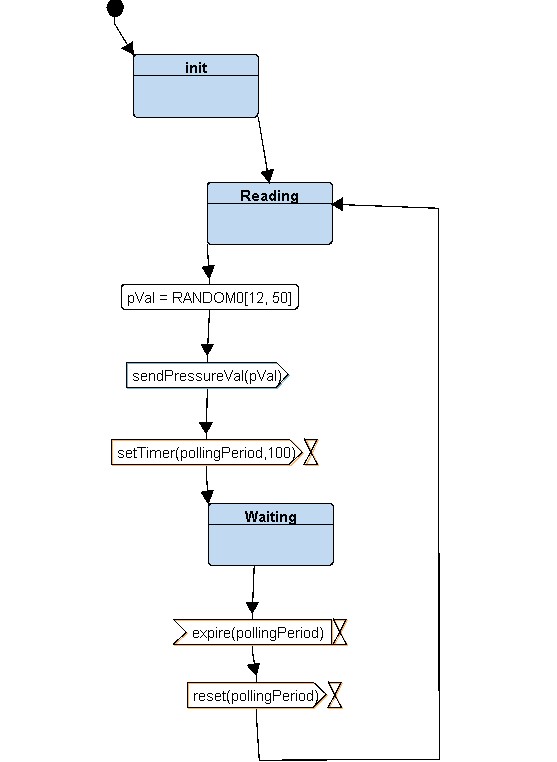


## Sequence Diagram

# System Design

## Block Diagram

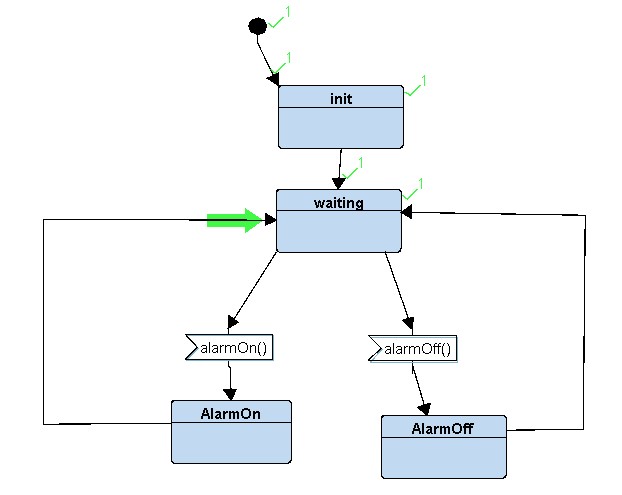
## Pressure Sensor State Machine



## Alarm Monitor State Machine

## Main Algorithm State Machine

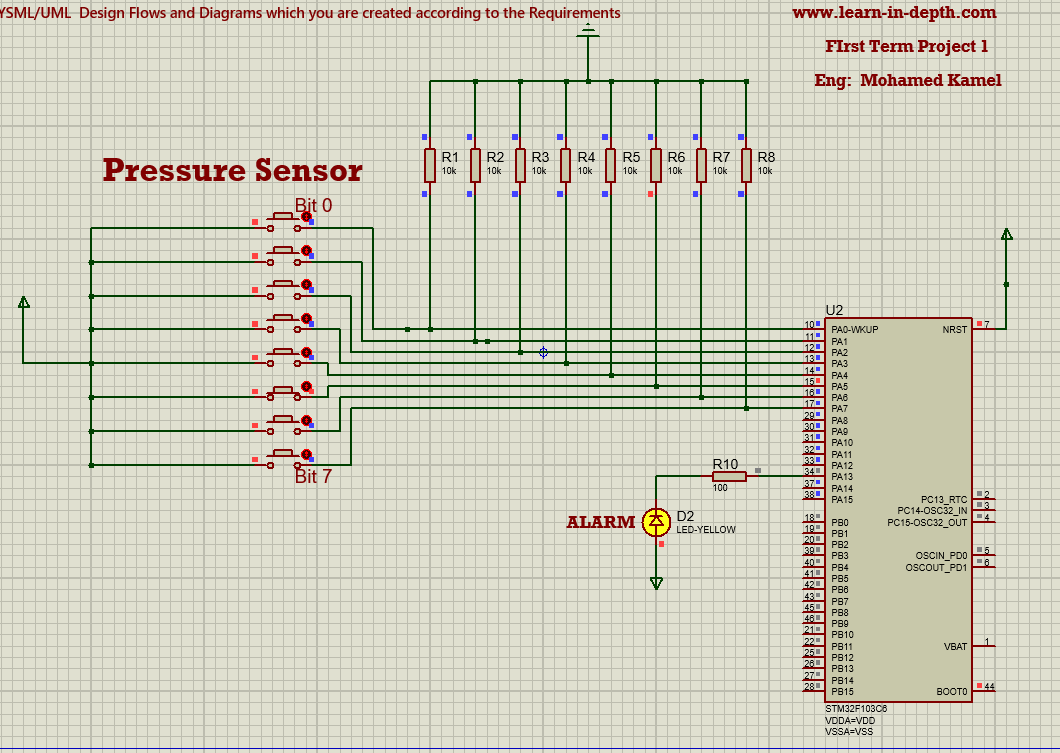
## Alarm State Machine

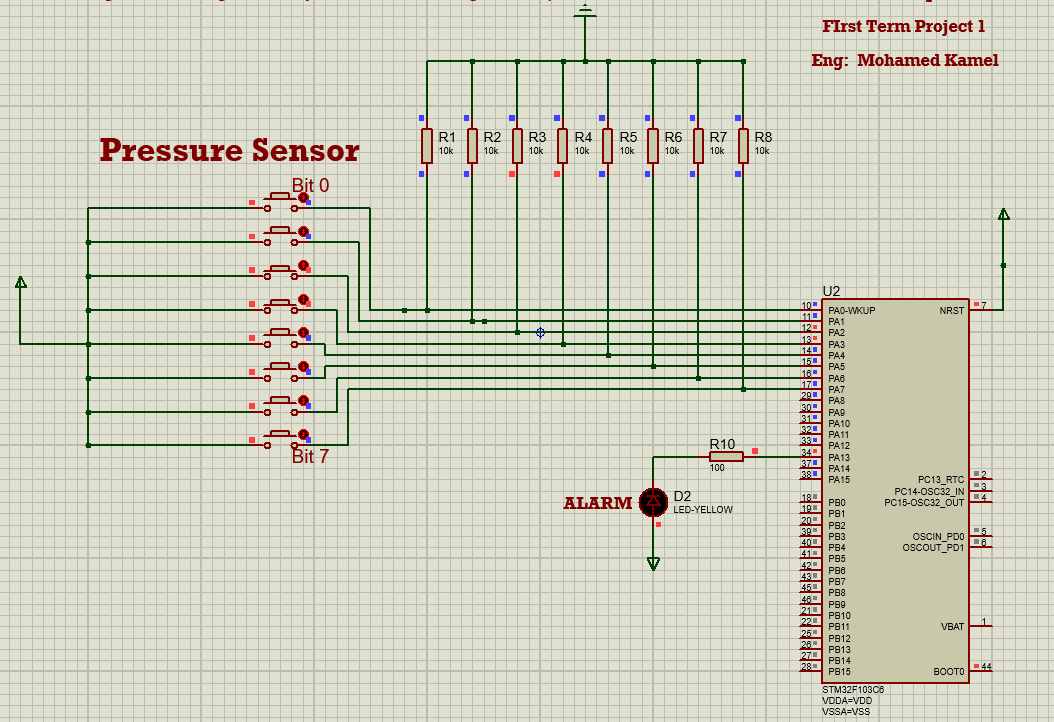


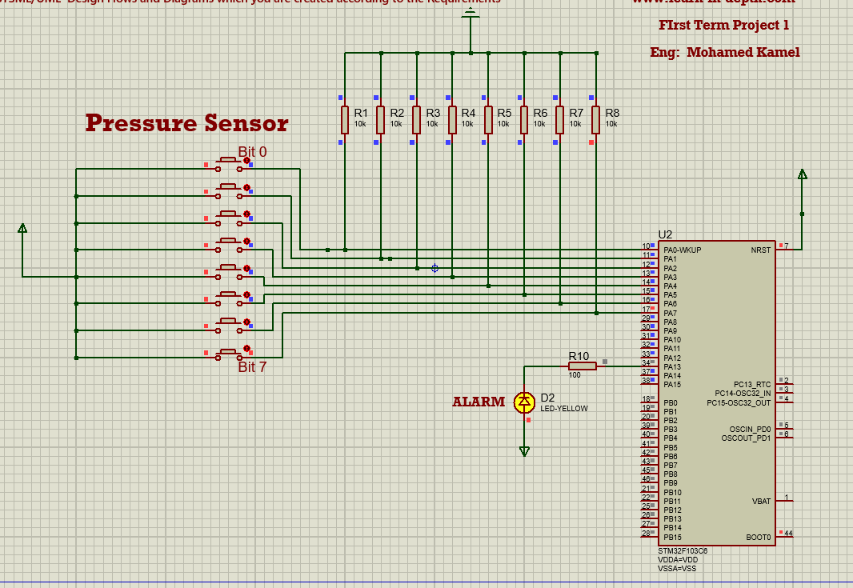
# State Machines’ Simulation

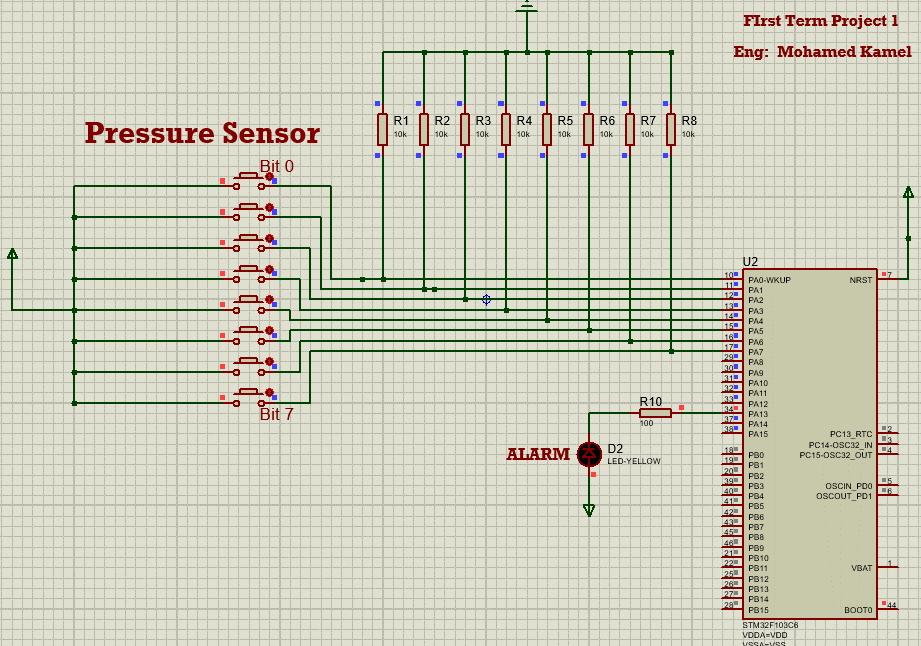
# Proteus Simulation

Test Cases:

Pressure Input Value:32

****Pressure Input Value:12

Pressure Input Value:128

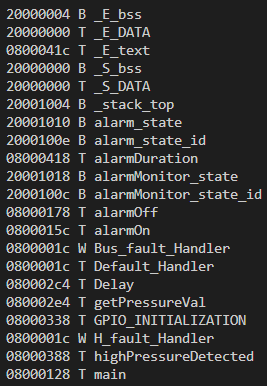
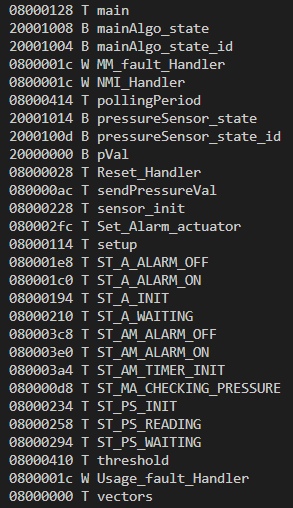
Pressure Input Value:0

# Code Analysis

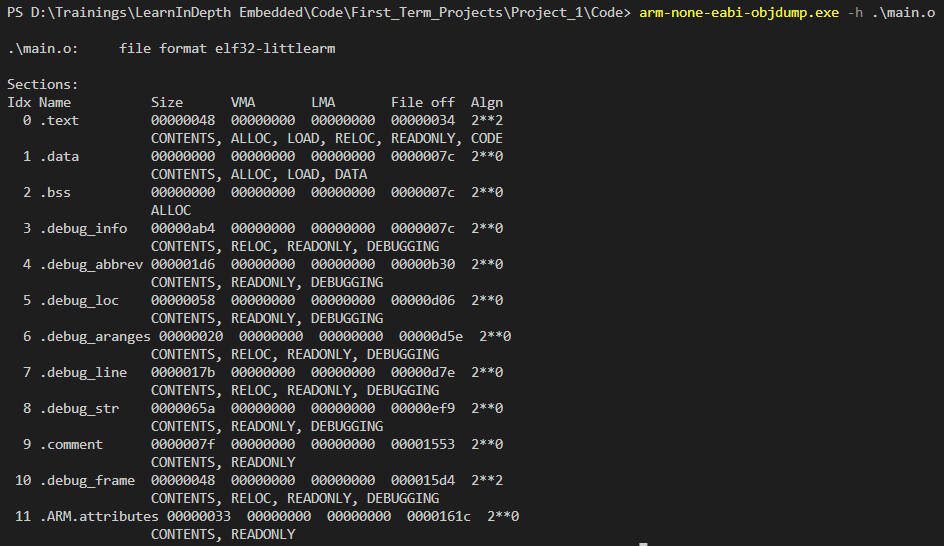
Repo:

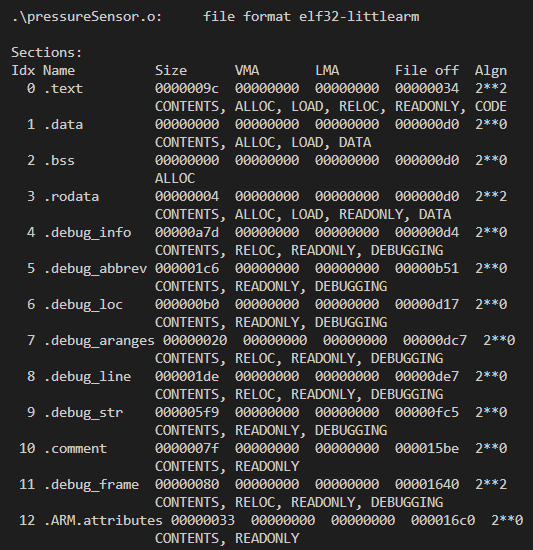
<https://github.com/Kamelz70/LID_Diploma/tree/main/First_Term_Projects/Project_1>

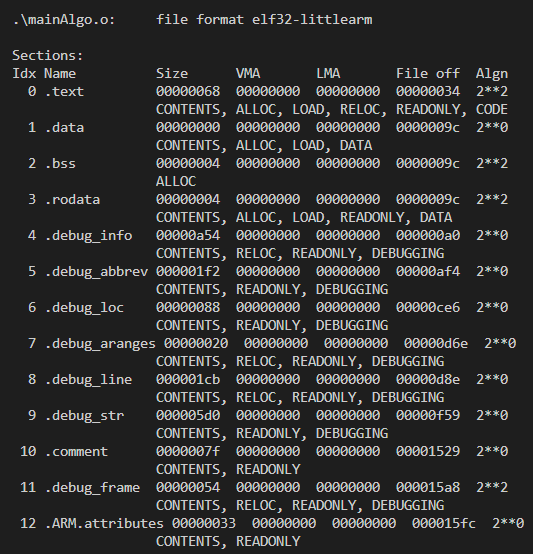
## Symbol Table

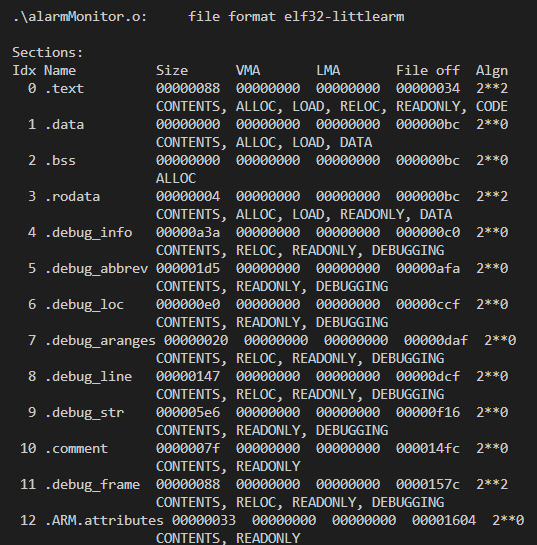


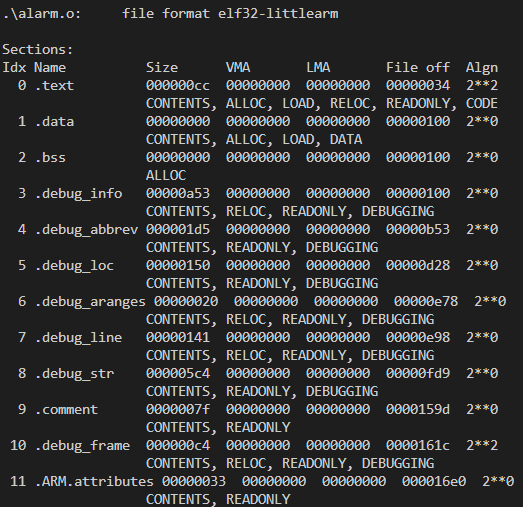
## Relocatable code Sections

main:

pressureSensor.o:

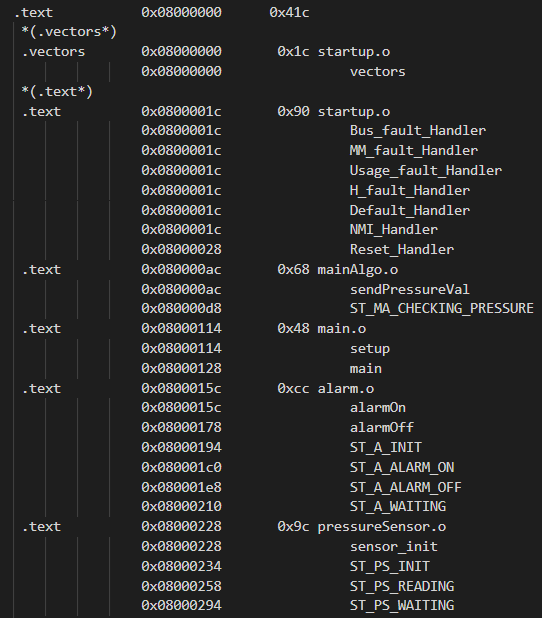
mainAlgo.o:

alarmMonitor.o:

alarm.o:

## Full Code Sections

## Map File Sample:

This is a map file sample showing section/symbol locations in memory