L&T Technology Services

GENESIS-Learning Outcome & Mini-project Summary Report

Details

Ver. Rel. No.	Release Date	Prepared By	Module Name	Reviewed By	To Be Approved	Remarks/Revision Details
1.0	16/02/2022	Anusha Upendar Gurram	C Programming on Multiple Platforms			
1.0	02/12/2021	Anusha Upendar Gurram	Essentials of Embedded System			
1.0	16/12/2021	Anusha Upendar Gurram	Applied SDLC and Software Testing			
1.0	23/12/2021	Anusha Upendar Gurram	OOPS with Python			
1.0	31/12/2021	Anusha Upendar Gurram	Applied Model Based Design Module			
1.0	07/01/2022	Anusha Upendar Gurram	Mastering Micro controllers with Embedded Driver Development Module			
1.0	21/01/2022	Anusha Upendar Gurram	Overview of Automotive Systems			
1.0	03/02/2022	Anusha Upendar Gurram	Applied Control Systems and Vehicle Dynamics			

Contents

List of Figures

Mini-project – 1: Tic-Tac-Toe [Individual]

Date: - Nov 15th to 25th.

Team/Individual:-Individual

Project topic:- Tictactoe Game

Modules:
1. C Programming
2. Git

Requirements

4W's and 1 H's

Why:

1. The Project will help student and children to develop with concentration.

2. This is a game anybody can play**.**

3. It can be used by anyone at any place.

4. This is a purely leisure game. Because there are so many different outcomes in this game, businesses can utilise it to design strategies.

Where: A simple tic tac toe game is accessible on a number of websites. In addition, corporations and organisations use it.

Who: It can be played by anyone.

When: This game can be played if you're bored or want to learn more about the game's methods, consequences, and scenarios game.

How: Blocks your opponent from winning as you try to win.

High Level Requirements

ID	Description	Status
HLR_1	Users can use a web browser to obtain the information	Implemented
HLR_2	From the landing page, the user should choose the game's difficulty level and begin playing	Implemented
HLR_3	When a user moves, the game page allows them to move	Implemented
HLR_4	The user can see the opponent's movements in real time on the game page	Implemented
HLR_5	The user can pick up where they left off in a game that isn't yet finished	Implemented
HLR_6	When one player gets three symbols in a row, the game should be over	Implemented
HLR_7	After the game, the user sees the results	Implemented

Low Level Requirements

ID	Description	Status
LLR-1	Players personal details like gender, contact number.	Implemented
LLR-2	After the game the user see the results.	Implemented

Design

• ACTIVITY DIAGRAM:
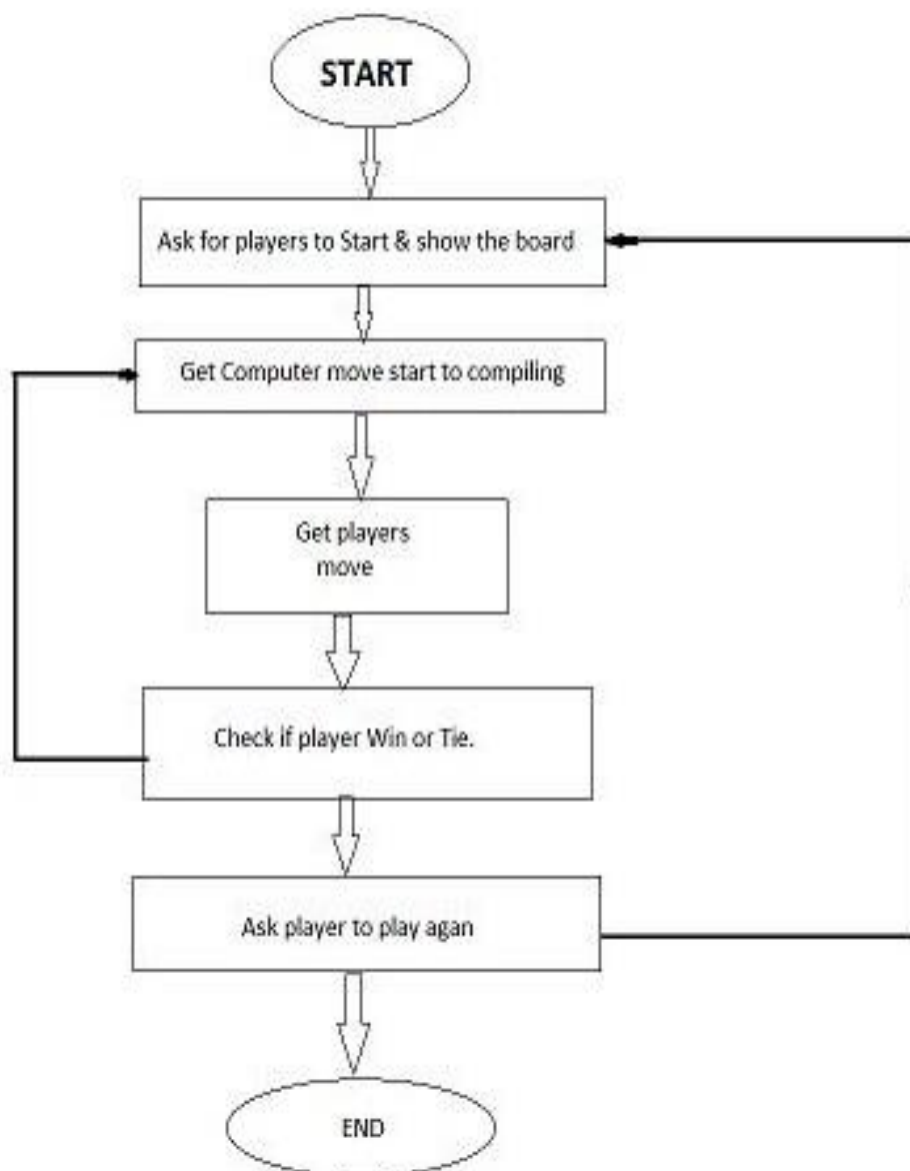
Figure 1 Behavior Diagram

- Structural Diagram:
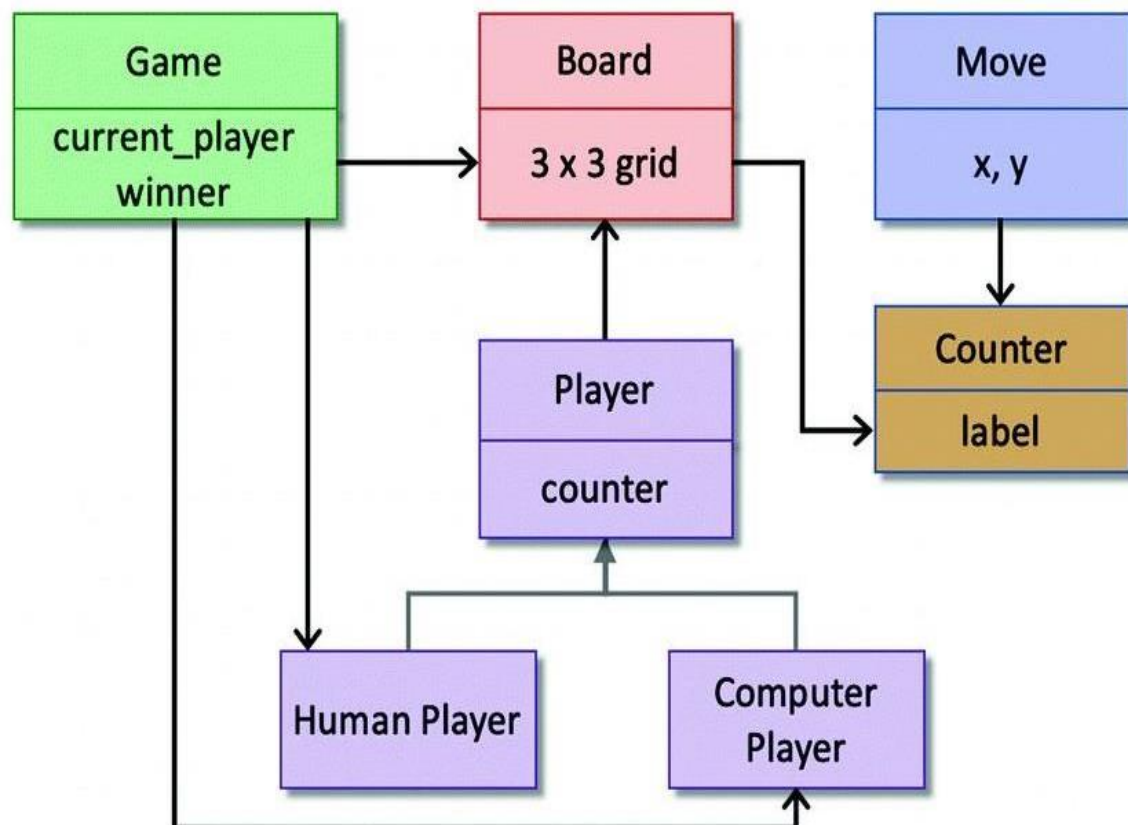
Figure 2 Structure Diagram

Test Plan
High Level Test Plan

HLR-1	Users can use a web browser to obtain the information.
HLR-2	From the landing page, the user should choose the game's difficulty level and begin playing
HLR-3	When a user moves, the game page allows them to move
HLR-4	The user can see the opponent's movements in real time on the game page
HLR-5	The user can pick up where they left off in a game that isn't yet finished
HLR-6	When one player gets three symbols in a row, the game should be over
HLR-7	After the game, the user sees the results

Low Level Test Plan

LLR-1	Name of the player
LLR-2	Players personal details like gender, contact number.

Implementation and Summary
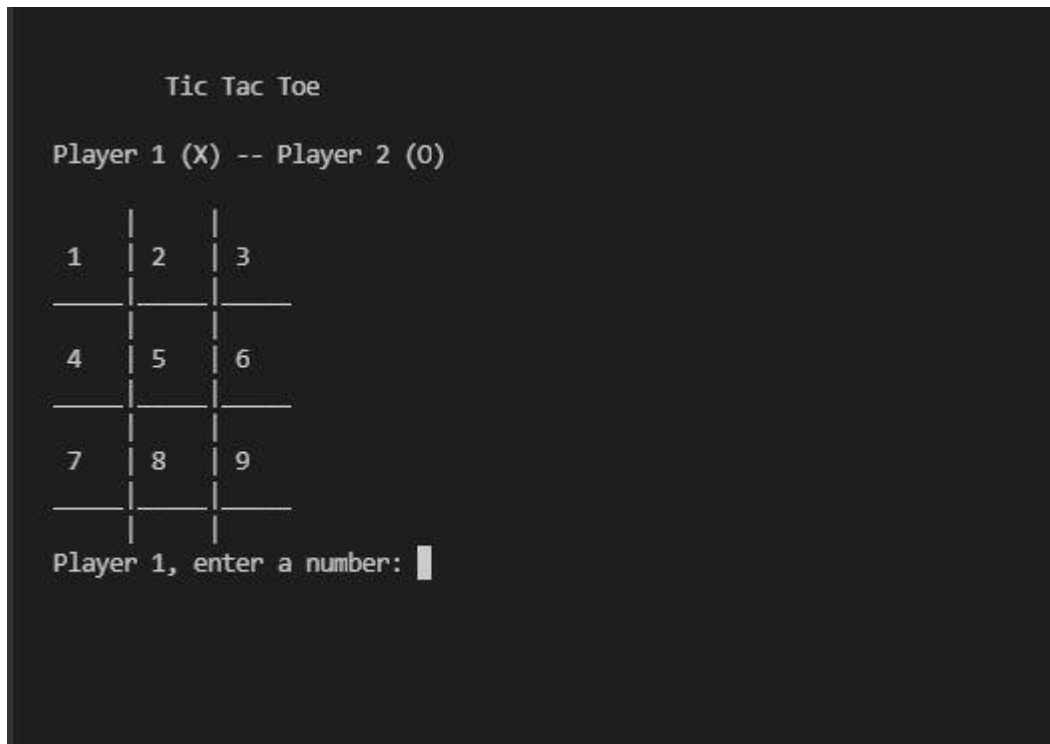
```
        |      |
  1     |  2   |  3
_____|_____|_____
        |      |
  4     |  5   |  6
_____|_____|_____
        |      |
  7     |  8   |  9
_____|_____|_____
        |      |
Player 1, enter a number: 1

           Tic Tac Toe

Player 1 (X) -- Player 2 (O)
        |      |
  X     |  2   |  3
_____|_____|_____
        |      |
  4     |  5   |  6
_____|_____|_____
        |      |
  7     |  8   |  9
_____|_____|_____
        |      |
Player 2, enter a number: █
```

```
        |      |
  X     |  2   |  3
_____|_____|_____
        |      |
  4     |  5   |  6
_____|_____|_____
        |      |
  7     |  8   |  9
_____|_____|_____
        |      |
Player 2, enter a number: 5

           Tic Tac Toe

Player 1 (X) -- Player 2 (O)
        |      |
  X     |  2   |  3
_____|_____|_____
        |      |
  4     |  O   |  6
_____|_____|_____
        |      |
  7     |  8   |  9
_____|_____|_____
        |      |
Player 1, enter a number: 7█
```

Git Link:

Link: https://github.com/GurramAnnu/M1_application_TicTacToe.git

Certification Done: -

- SOLO Learn Certification.
- Linux Certification.
- GitHub Learning Certification.

Miniproject 2 – Embedded Calculator [Individual]

<u>Date</u>: - Nov 26th to 2nd.

<u>Team/Individual</u>:- Individual.

<u>Project topic</u>: - Embedded Object Sensing System

Modules
1. C Programming
2. Embedded System
3. Simul-IDE
4. Git

Requirements
4W's and 1 H's

Who:

The importance of the project is to detect and calculate accurate distance from any obstacle that we want to measure. Ultrasonic sensors are used primarily as proximity sensors. They can be found in automobile self-parking technology, medical applications and anti-collision safety systems

What:

I have made a setup based on a microcontroller in which object detection and real time distance is sensed by an ultrasonic sensor and displays measured distance on an LCD display.

When:

This will be useful to user when they need assistance in dark light and whenever we want to measure the particular distance from the moving object.

Where:

It measures accurate distance using a non-contact technology.

How:

Ultrasonic sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor if obstacle detected. Sensors calculate the time interval between sending the signal and receiving the echo to determine the distance to an object.

High Level Requirements

ID	Description	Status
HLR_1	Interfacing Ultrasonic Sensor with controller	Implemented
HLR_2	Interfacing LCD display with controller	Implemented
HLR_3	Installing required software on the PC/Laptop	Implemented

Low Level Requirements

ID	Description	Status
LLR1	Setting the range up-to 80 cm	Implemented
LLR2	The high level signal is sent to 10ms using Trigger	Implemented

Design

```
           ┌──────────┐
           │  Start   │
           └──────────┘
                │
                ▼
         ┌──────────────┐
         │  Reset LCD   │
         └──────────────┘
                │
                ▼
         ┌──────────────┐
         │ Reset Counter│
         └──────────────┘
                │
                ▼
    ┌────────────────────────┐
    │ Sent driver signal to  │
    │ ultrasonic transmitter │
    │ and begin to count the │
    │        pulses          │
    └────────────────────────┘
                │
                ▼
          ◇ Detect the echo
            signal?          ── No ──┐
                │                    │
               Yes                   │
                ▼                    │
    ┌────────────────────────┐       │
    │ Count stop and calculate│      │
    │     the distance        │      │
    └────────────────────────┘       │
                │
                ▼
         ┌──────────────┐
         │ Display on LCD│
         └──────────────┘
                │
                ▼
           ┌──────────┐
           │   End    │
           └──────────┘
```
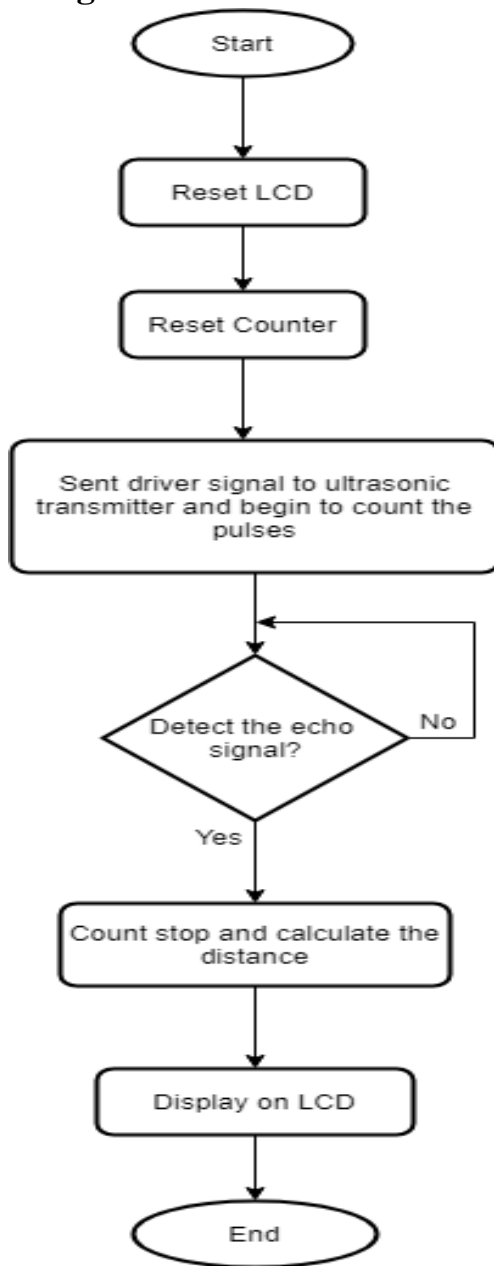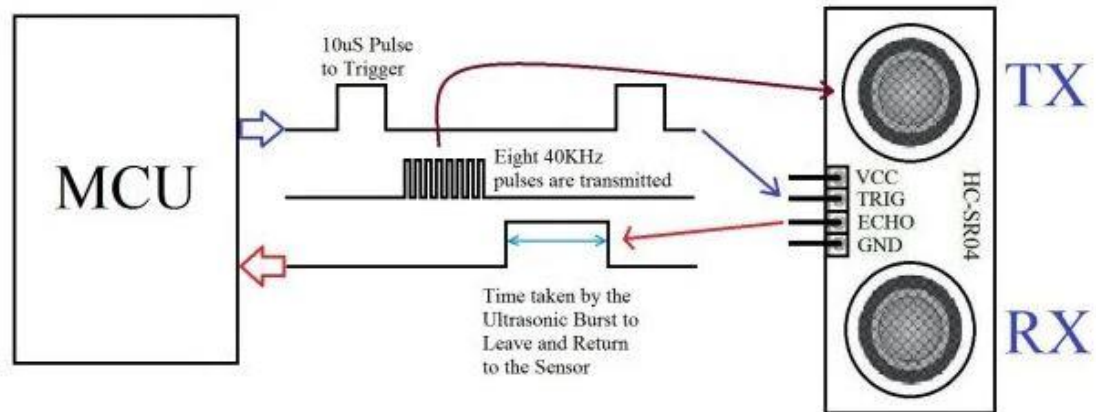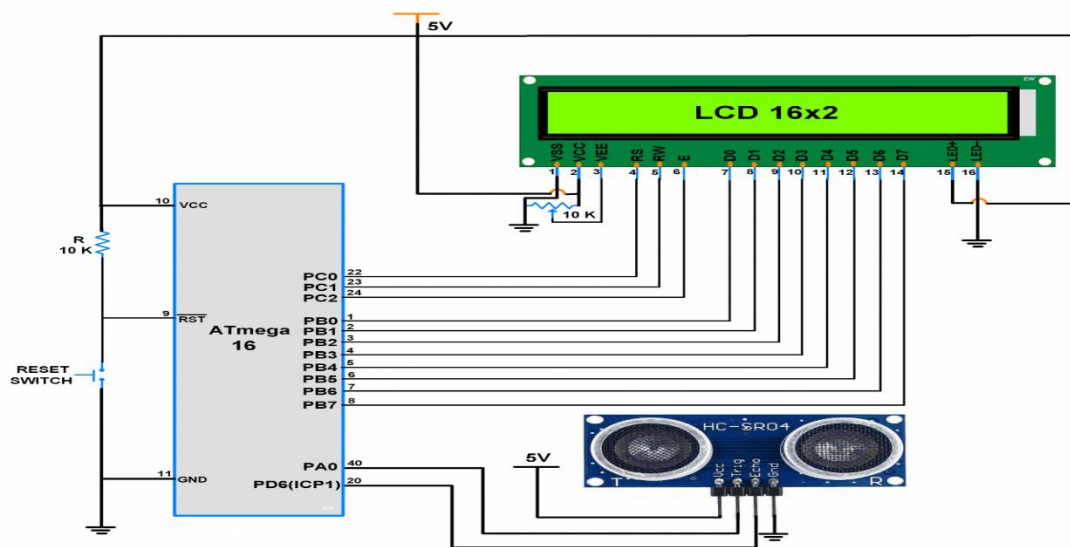
Flow chart

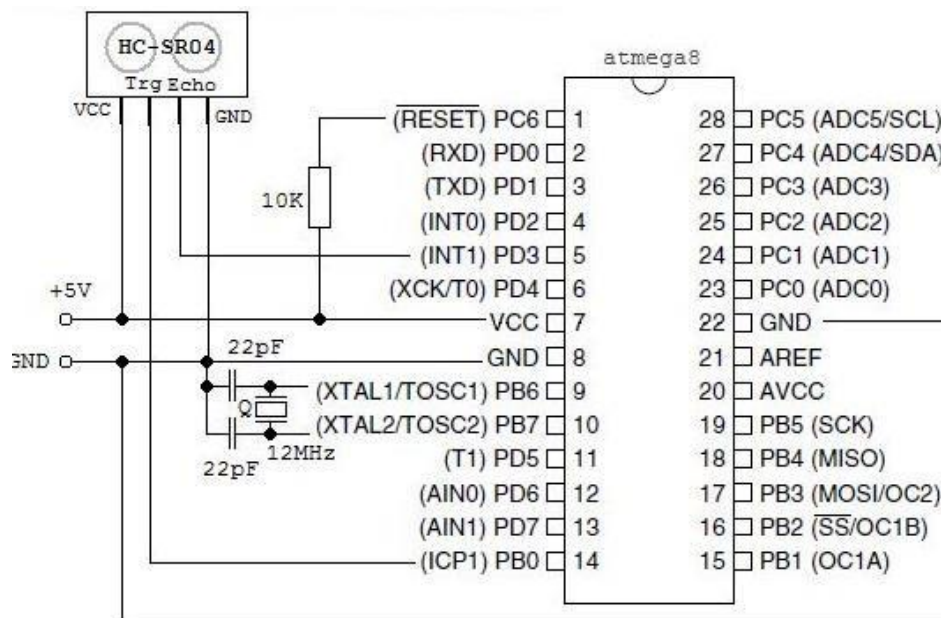Working of HC-SR04 Ultrasonic Sensor

Behavioural Diagram

Block Diagram

Structural Diagram

Circuit Diagram

Test Plan
High Level Test Plan

| ID	Description	Expected I/P	Expected O/P	Actual O/P	Type Of Test
HLTP_1	Sensor Working	Obstacle	Obstacle Detected	SUCCESS	Requirement Based
HLTP_2	High accuracy	Object in the range	Accurate distance from object on Display	SUCCESS	Scenario Based
HLTP_3	Measuring time lapses between the sending and receiving of the ultrasonic pulse	Object in the range	Display	SUCCESS	Requirement based

Low Level Test Plan

ID	Description	Expected I/P	Expected O/P	Actual O/P	Type Of Test
LLTP_1	Detection of clear objects	Obstacle	Display	SUCCESS	Scenario Based

ID	Description	Expected I/P	Expected O/P	Actual O/P	Type Of Test
LLTP_2	Provide multiple range measurements	Moving Obstacle	Display	SUCCESS	Requirement Based

Implementation and Summary
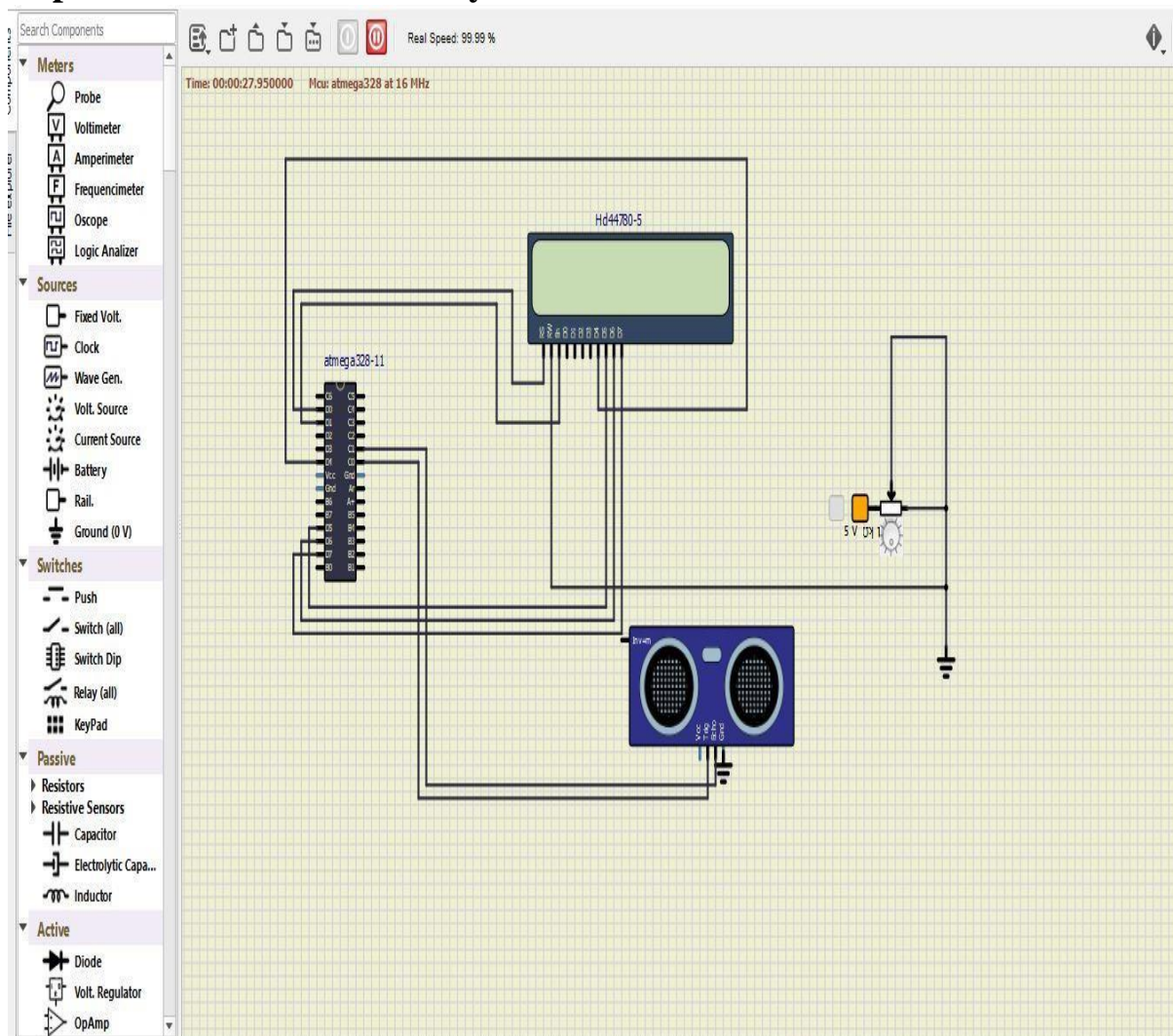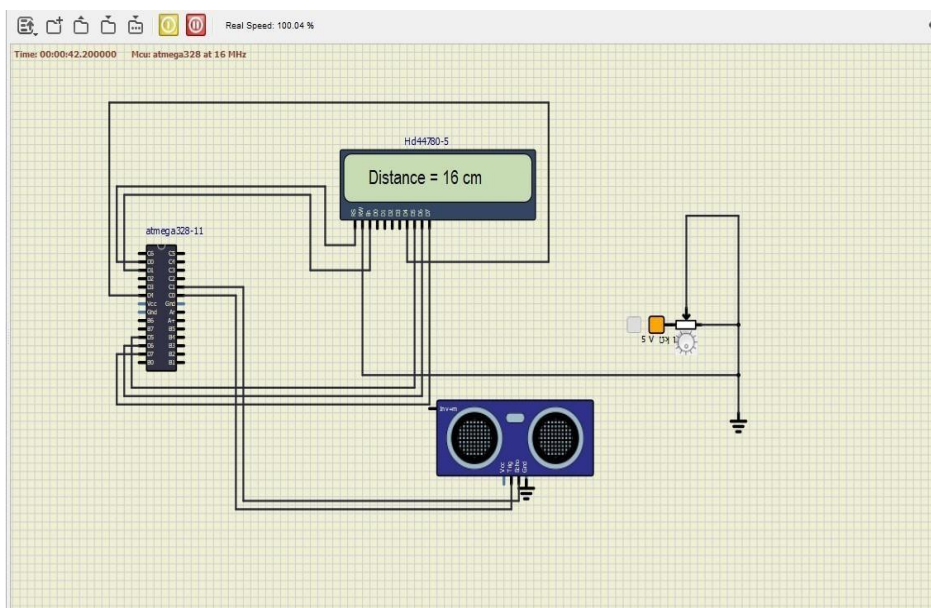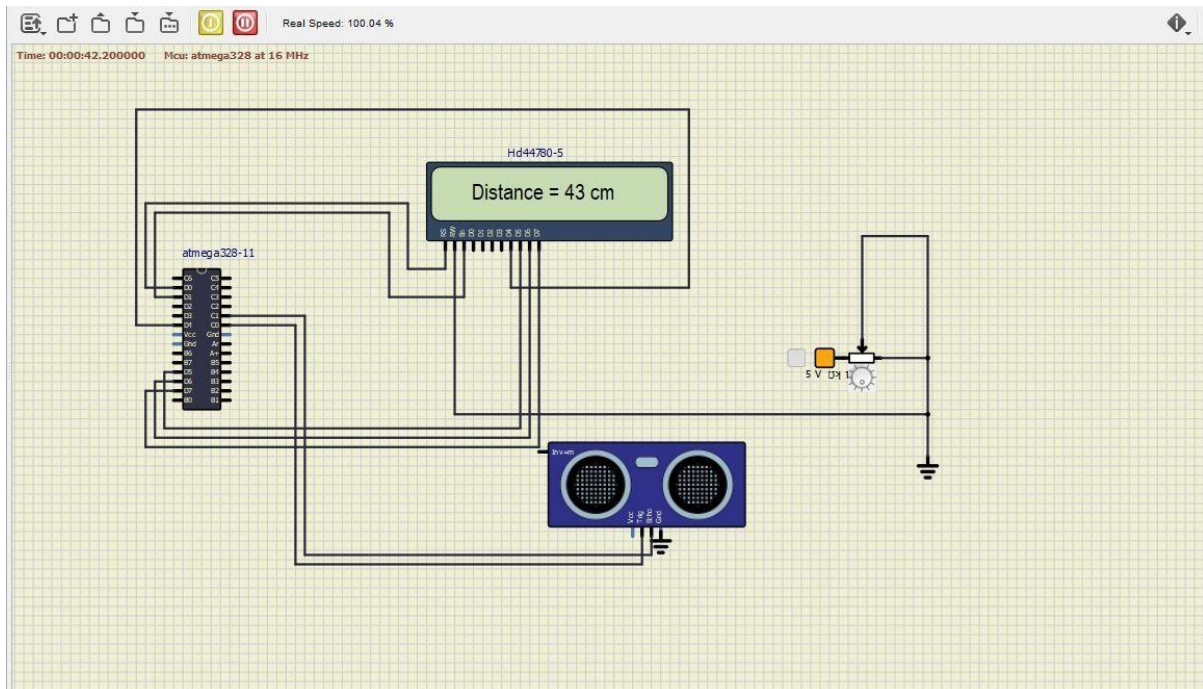
Git Link:

Link: https://github.com/GurramAnnu/M2-Embedded_ObjectSensingSystem.git

<u>Module</u>: - Applied SDLC and Software Testing.

<u>Date</u>: - Dec 10th to 16th.

<u>Team/Individual</u>: - Team.

<u>Project topic</u>: - Food court billing system.

Aim: -

> The main aim of food court billing application is to provide clean and fresh food to the students/employees of the organization. In many organizations, entire mess management and billing calculations are done manually till date. It is very time consuming and increases the chances of performing calculation mistakes. It would be possible to do the same work within a short period of time and without using much efforts and manpower if there existed a software for the same. Thus, there arises a need to create a software for the same. Such a software would make the entire Mess related management an automated system. The software is not only restricted to food items and their billing manipulations, but handling the information of the cadets seeking training in the PTC is also possible in the software. Thus, such a combination in a single software is of great benefits.

Requirements
Introduction

> For simplicity and better understanding of the owner, this software is designed. It would avoid confusion and help operate the software easily. Also, such a software that is easy to use will reduce the work of owner who still maintain all the logs in registers and files. It would be of great benefit as all calculations would be done easily on the click of a button. This reduces the burden on the owner as the paperwork or calculation work is reduce and other essentials to update.

Features:

- For the calculate bills, the user can view their bills after ordering a food.
- For the add orders, the user can add new order of foods.
- For the edit orders, the user can edit their orders information.

- For the display orders, the user can view their orders.
- For the search orders, the user can search their orders.
- For the delete orders, the user can delete their order information.
- For the exit, the user can also exit in the system.

SWOT analysis:

a) Strength:

This system is a keeping track of billing records, menus and extra food items.

a) Weakness:

All the staff needs to be trained on the software. If there is a power failure, thehotel runs a high risk of losing all the stored information.

b) **Opportunity:**

This project can be merged with any major projects in future where meals andtheir monthly calculations need to be done.

c) **Threat:**
If there is a virus attack the stored information might get corrupt.

4W's and 1 H's

Who:

It can be used by the owner of the food court to update and to use it freely.

What:

A user-friendly application for used to check update in food court daily.

When:

As the customers in their recess time use food court inside the company for theirfood consumption they will need a management system to check today's update.

Where:

Used in all mess canter's running inside a company for owner's benefit.

How:

It can be used in a mobile app easily or can login in a PC.

Detail requirements: -
High Level Requirements

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ID	Description
HLR1	Customer should be able to add item via item.
HLR2	Customer should be able to search items from menu function.
HLR3	Customer should be able to see their order on display function.
HLR4	Customer should able to edit their orders.

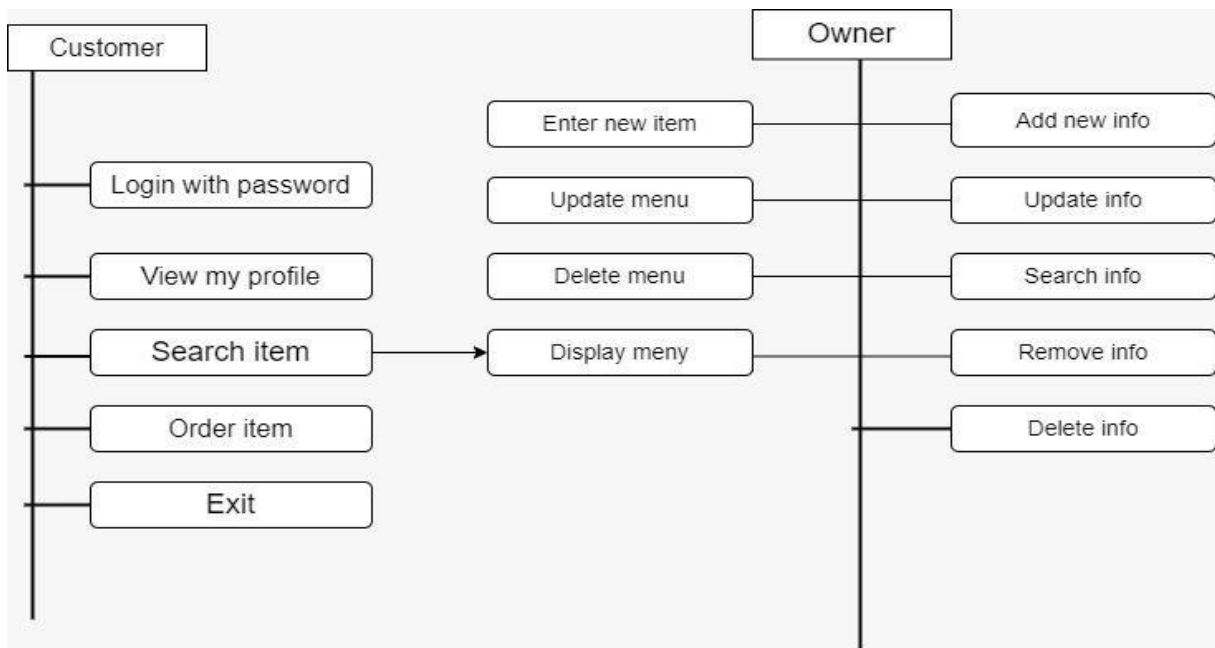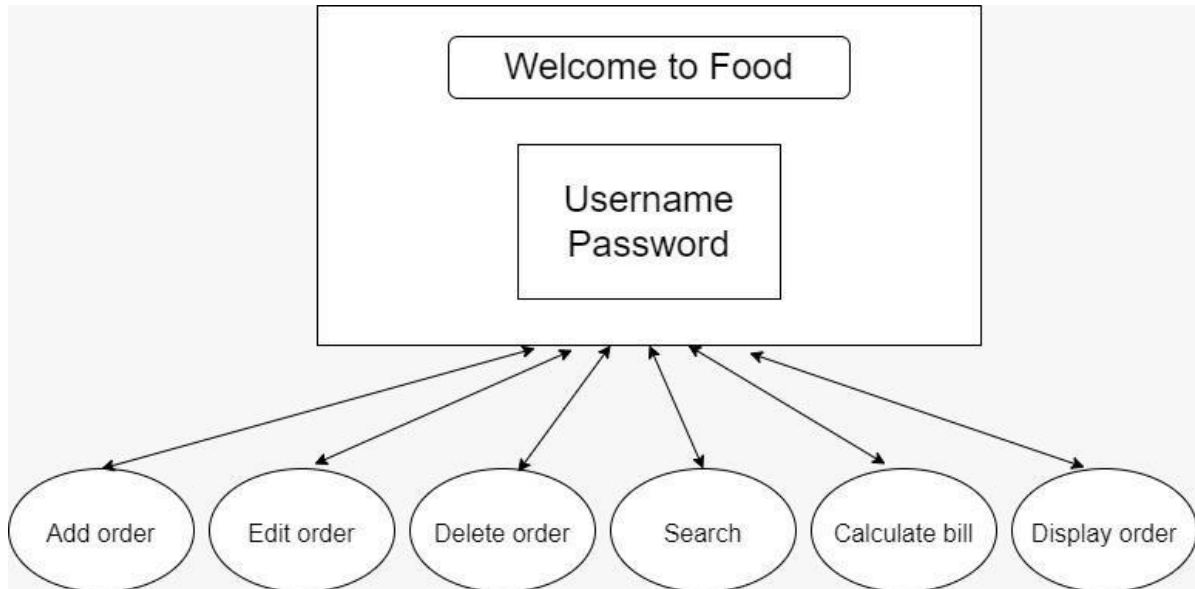| ID	Description
HLR5	Customer should able to search item via name or item code.
HLR6	Application should able to do the all calculation that are required to generate bill amount.
HLR7	Customer should be able to delete the particular item from ordered list.

Low Level Requirements

ID	Description
LLR1	Login Page off Food Court.

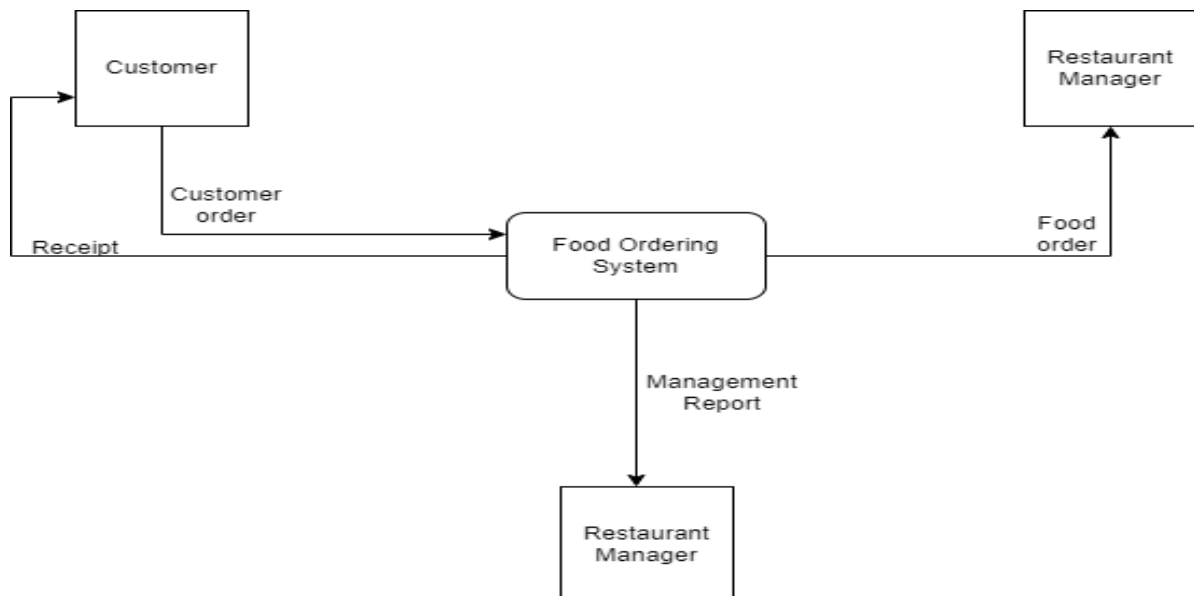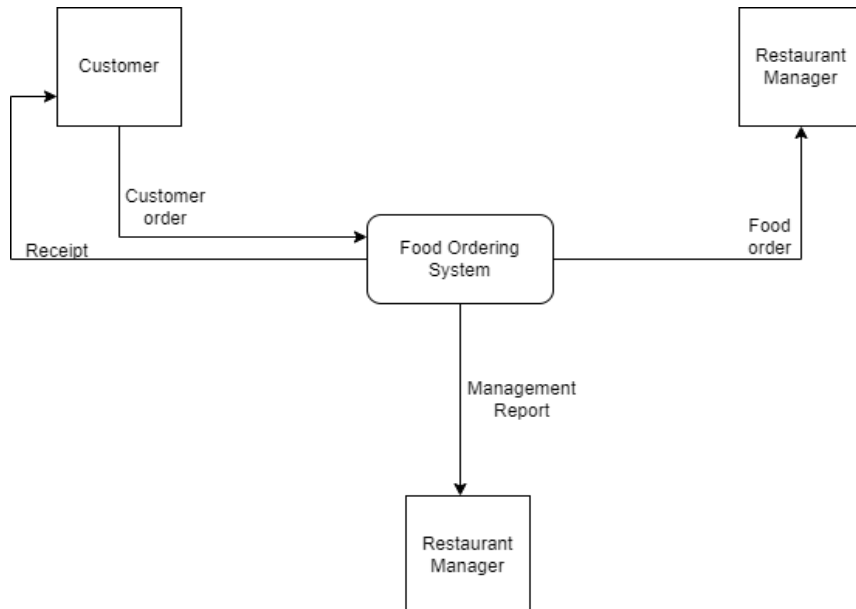| LLR2	Enter user and password.
LLR3	Newly added details should be display.
LLR4	Item name, quantity, rate should be removed.
LLR5	Item name, item number and item rate should be there while generating bill.
LLR6	Application should return exact final bill.

Design:

Block diagram:

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Structural diagram:

Behavioural diagram: Flow chart: 1

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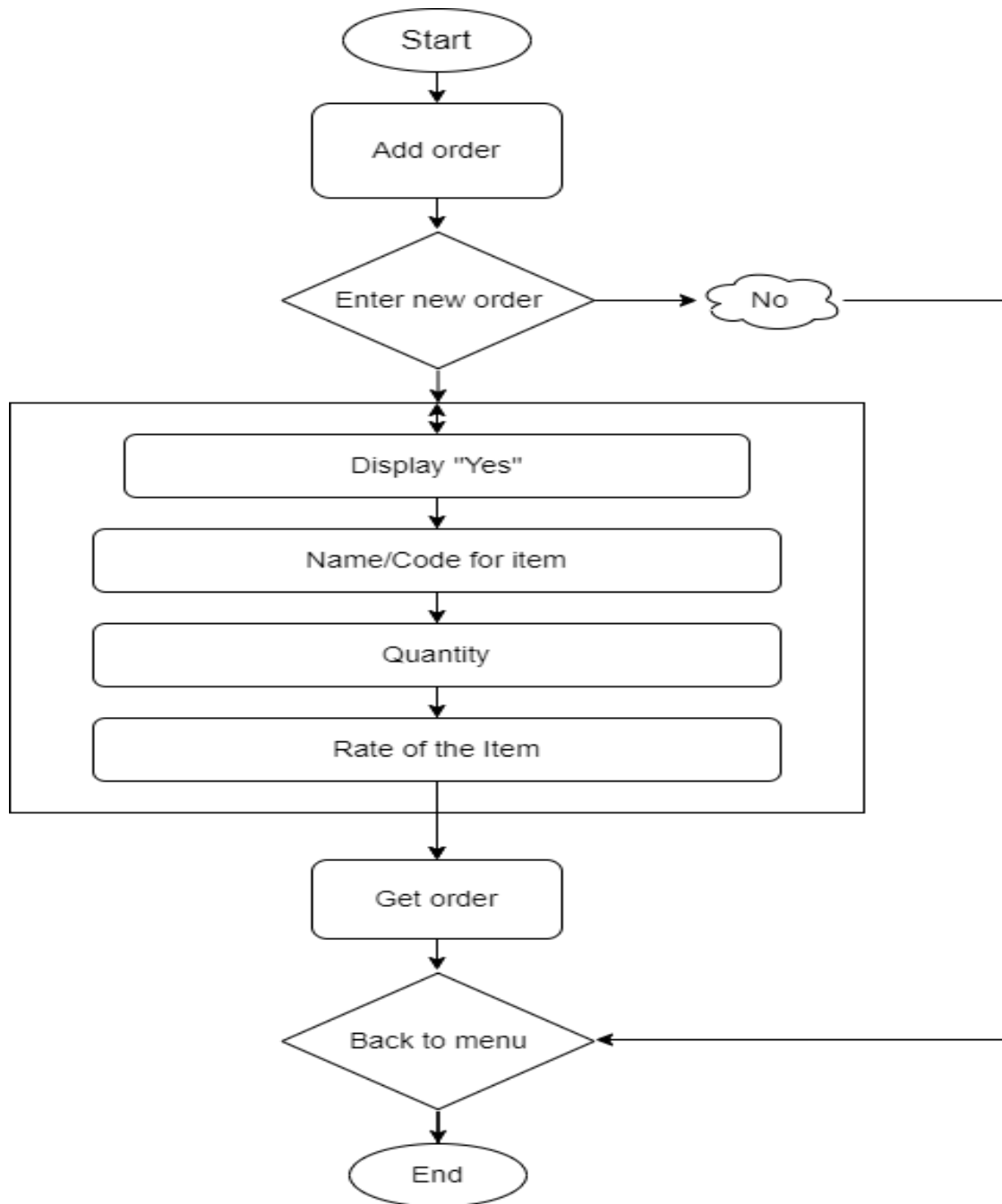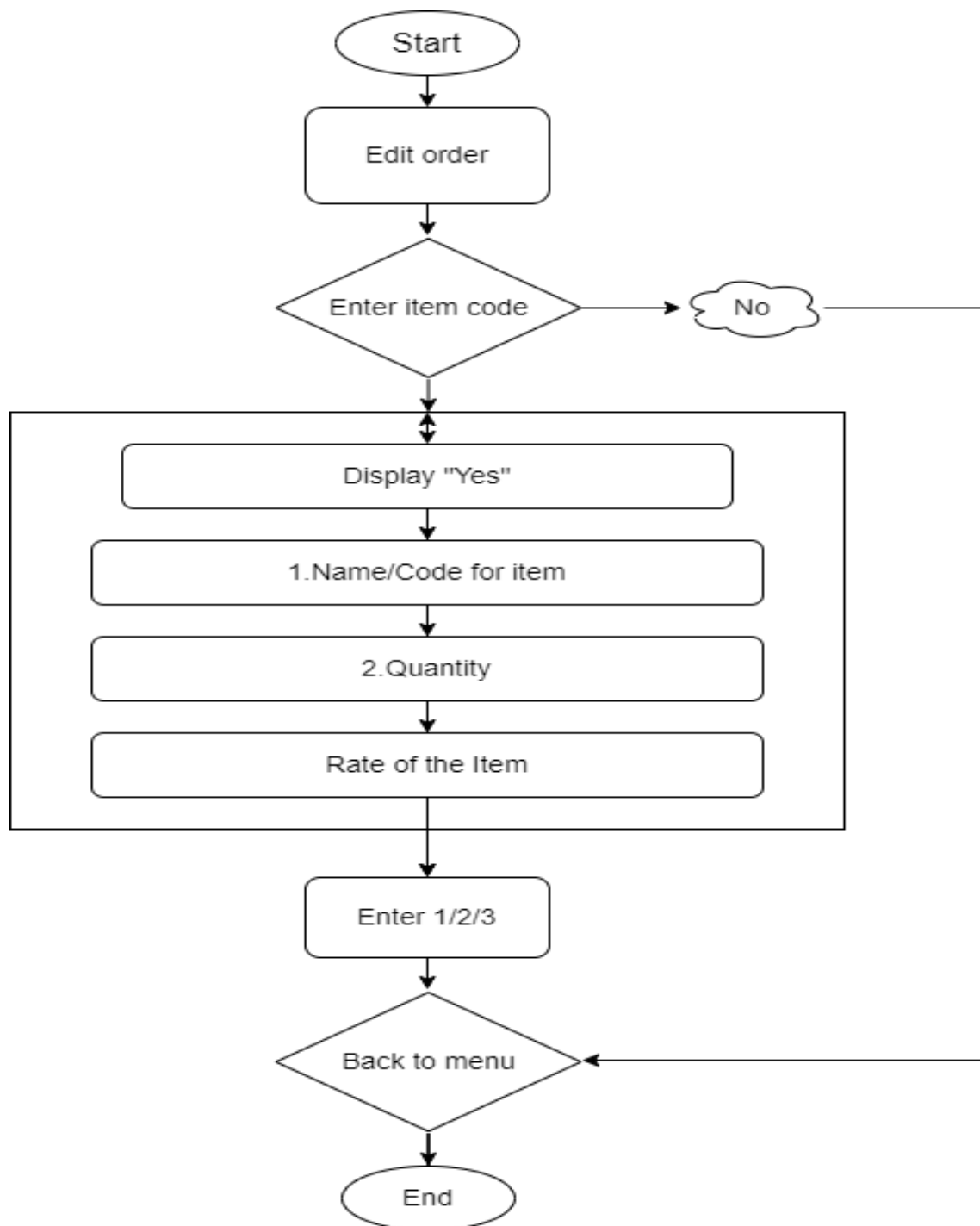
High level diagram:

Low level diagram:

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Test Plan:

High Level Test Plan

TEST_ID	Description	Expected I/P	Expected O/P	Actual O/P	Type Of Test
HLR_1	Login to system	Provide proper Username with character lengthof 10	entered username	entered username	Requirement Based
HLR_2	Login to system	Provide proper password with character lengthof 10	Login successful	Login successful	Requirement Based
HLR_3	Providing items that you wantto add	User Choice	Added Successfully	Added Successfully	Requirement Based

| HLR_4 | Display the menu | ---- | Added Items is Displayed | Added Items is Displayed | Requirement Based |
| HLR_5 | Bill Calculation | Choice | Customer's Bill | Customer's Bill | Requirement Based |

Low Level Test Plan

TEST_ ID	Description	Expected I/P	Expected O/P	Actual O/P	Type Of Test
LLR_1	Login to system	username and password is Incorrect (in case numbers or exceed length)	Login is Unsuccessful	Login is Unsuccessful	Requirement Based
LLR_2	Edit Item	Provide Item code	Item Edited	Item Edited	Requirement Based

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LLR_3	Delete Item	Provide Item	Item Deleted	Item Deleted	Requirement Based
LLR_4	Search Item	Provide Item Code	Item Searched	Item Searched	Requirement Based
LLR_5	exit operation	----	Exit Successfully	Exit Successfully	Requirement Based

Summary

- Add orders
- Edit orders
- Display orders
- Search orders
- Delete orders
- Calculate bill

Git Link:

Link: https://github.com/GENESIS2021Q1/Applied_SDLC-Dec_Team_47

References:

- http://www.organizationaldynamics.upenn.edu/system/files/Ac

Individual Contribution and Highlights

- Requirements
- Folder structure
- Implementation (Add Order in System)
- Created Unity File

Module: - OOPS with Python.

Date: - Dec 17th to 23rd.

Team/Individual: Team.

Project topic: - Calendar Automation

Modules
1. Python
2. Git

Link for template

2 Slots format -

M/A:
https://docs.google.com/spreadsheets/d/1jtKnXV12VE1fH20CG
Do4B3uNWRTAhQCWz-hHUDWUe3I/edit?usp=sharing

4 Slots format -

M1/M2/A1/A2:
https://docs.google.com/spreadsheets/d/1jVheSPZkOtfNKRNo
c_858nwk2UaHCe0gExTNZfZ8vxA/edit?usp=sharing

Requirements
High Level Requirements

ID	Feature	Status
HLR_01	GUI	Not Implemented
HLR_02	Attendance Status	Implemented

ID	Feature	Status
HLR_03	User Details	Implemented
HLR_04	User load sheet	Implemented
HLR_05	Output file generation	Implemented

Low Level Requirements

ID	Feature	High Level ID	Status
LLR_01	GUI should allow user to enter inputs	HLR_01	Not Implemented
LLR_02	Input Files For Different Sessions	HLR_01	Not Implemented
LLR_03	User can get the Attendance Status	HLR_02	Implemented
LLR_04	User can enter status input to get the Attendance Status	HLR_02	Implemented
LLR_05	User can get the user details	HLR_03	Implemented
LLR_06	User will get the details after the successfully attendance entry	HLR_03	Implemented
LLR_07	User can load different sheets	HLR_04	Implemented
LLR_08	User can also modify the existing sheets as it is dynamic	HLR_04	Implemented
LLR_09	Output file gets generated	HLR_05	Implemented

ID	Feature	High Level ID	Status
LLR_10	Multiple files can be generated with different inputs	HLR_05	Implemented

Test Plan
High Level Test Plan

ID	Description	Expected I/P	Expected O/P	Actual O/P	Type Of Test
HLTP_01	Attendance Status	User Input	SUCCESS	SUCCESS	Requirement Based
HLTP_02	User details	User Input	SUCCESS	SUCCESS	Requirement Based
HLTP_03	User load sheet	User Input	SUCCESS	SUCCESS	Requirement Based
HLTP_04	Output file generation	User Input	SUCCESS	SUCCESS	Requirement Based

Low Level Test Plan

ID	HLTP ID	Description	Expected I/P	Actual O/P	Type Of Test
LLTP_01	HLTP_01	User can get Attendance Status	SUCCESS	SUCCESS	Requirement Based
LLTP_02	HLTP_01	User can enter Status input to	SUCCESS	SUCCESS	

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ID	HLTP ID	Description	Expected I/P	Actual O/P	Type Of Test
		get the Attendance Status			
LLTP_03	HLTP_02	User can get the User details	SUCCESS	SUCCESS	Requirement Based
LLTP_04	HLTP_02	User will get the details after the successful attendance	SUCCESS	SUCCESS	Requirement Based
LLTP_05	HLTP_03	User can load different sheets	SUCCESS	SUCCESS	Requirement Based
LLTP_06	HLTP_03	User can also modify the existing sheets as it is dynamic	SUCCESS	SUCCESS	Requirement Based
LLTP_07	HLTP_04	Output file gets generated	SUCCESS	SUCCESS	Requirement Based
LLTP_08	HLTP_04	Multiple files can be generated with different inputs	SUCCESS	SUCCESS	Requirement Based

Implementation and Summary

Git Link:

Link: https://github.com/Pradnya579/GENESIS2021-OOP-Python_Team_46.git

Git Dashboard

Build	Pylint	Pytest	Git Inspector
Python package passing	Code Quality passing	PyTest passing	Git inspector passing

Git Dashboard

Individual Contribution and Highlights

1. Improved implementation of Python Programming
2. Source code management using GitHub

Role in Project Team

1. Programmer: Done Programming for Attendance Automation
2. Integrator: Integrated all the codes
3. Tester: Writing Testcases and testing the integrated code

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Module: - Applied Model Based Design Module.

Date: - Dec 27th to 31st.

Team/Individual: - Scorpio Team.

Project topic: - Air Conditioner System.

Modules
1. Matlab
2. Git

Requirements
We have implemented following features

1. Power Windows
2. Anti-Lock Breaking System
3. Wiper System
4. Air Conditioner
5. Sunroof Control

Design
This project was implemented using Matlab.

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Module: - Mastering Microcontrollers with Embedded

DriverDevelopment Module

Date: - Jan 3rd to 7th.

Team/Individual: - Team.

Project topic: - Wiper Control System Using STM32F407VG.

Modules
1. C Programming
2. STM32

Requirements
4W's and 1'H

Who:

Users who drives the vehicles can use this.

What:

This project is concerned is about automatic wiper system in vehicles.

When:

When there is a change in the weather the wipers work automatically.

Where:

This projects helps the users to achieve the clear path when there is a change of weather.

How:

The wiper system is controlled using rain sensor, temperature sensor and SMT32 microcontroller

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High Level Requirements

ID	Description	Status
HLR_1	Press and hold the button to put the Ignition key position in ACC mode	Implemented
HLR_2	Different wiper frequencies to be set (1Hz, 4Hz & 8Hz)	Implemented
HLR_3	Hold the button to put the system in Idle state	Implemented

Low Level Requirements

ID	Description	HLTP ID	Status
LLR_1	Hold the button for 2 sec to bring the ignition key position at ACC mode	HLR_1	Implemented
LLR_2	Hold the button for 2 sec to go back to the Idle state	HLR_1, HLR_3	Implemented
LLR_3	Press the button one time to set frequency to 1Hz	HLR_2	Implemented
LLR_4	Press the button second time to set frequency to 4Hz	HLR_2	Implemented
LLR_5	Press the button third time to set frequency to 8Hz	HLR_2	Implemented
LLR_6	Press the button fourth time to turn OFF the wiper action	HLR_2	Implemented

ID	Description	HLTP ID	Status
LLR_7	Hold the button for 2 sec to bring ignition key position at Lock state	HLR_3	Implemented

Design
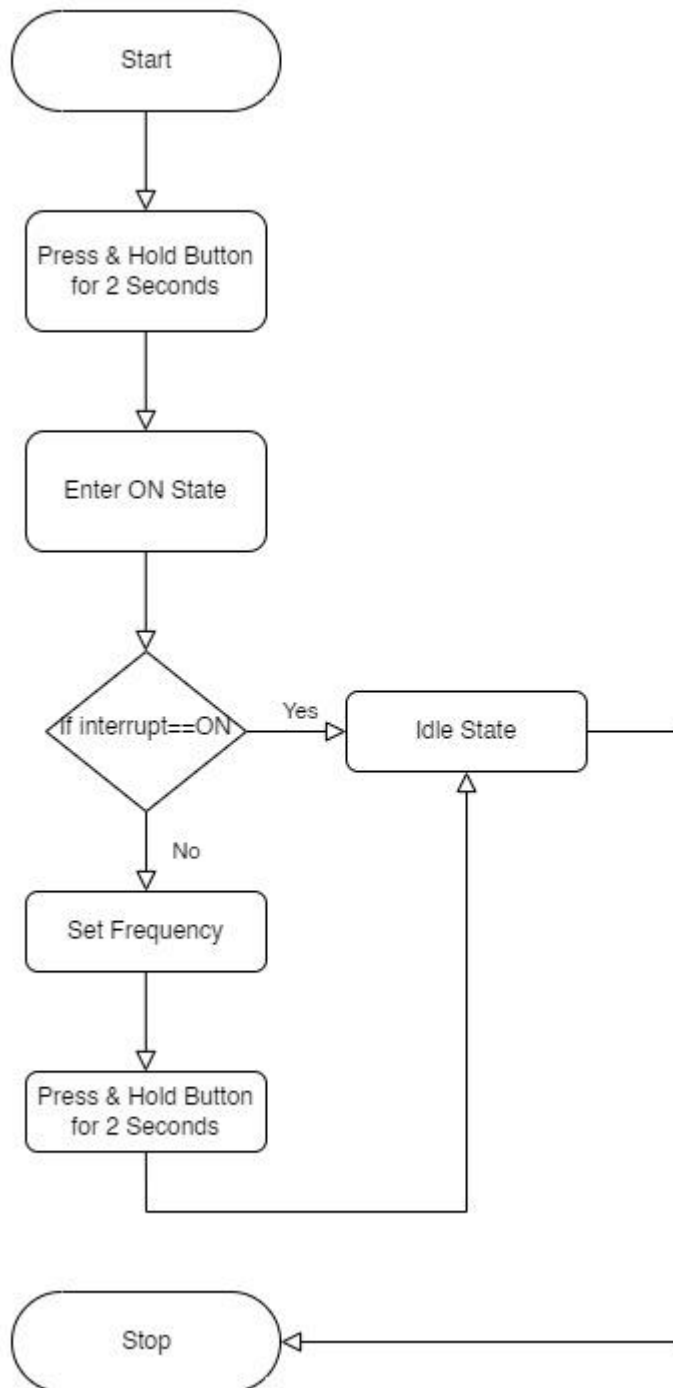
Figure 3 Structure Diagram
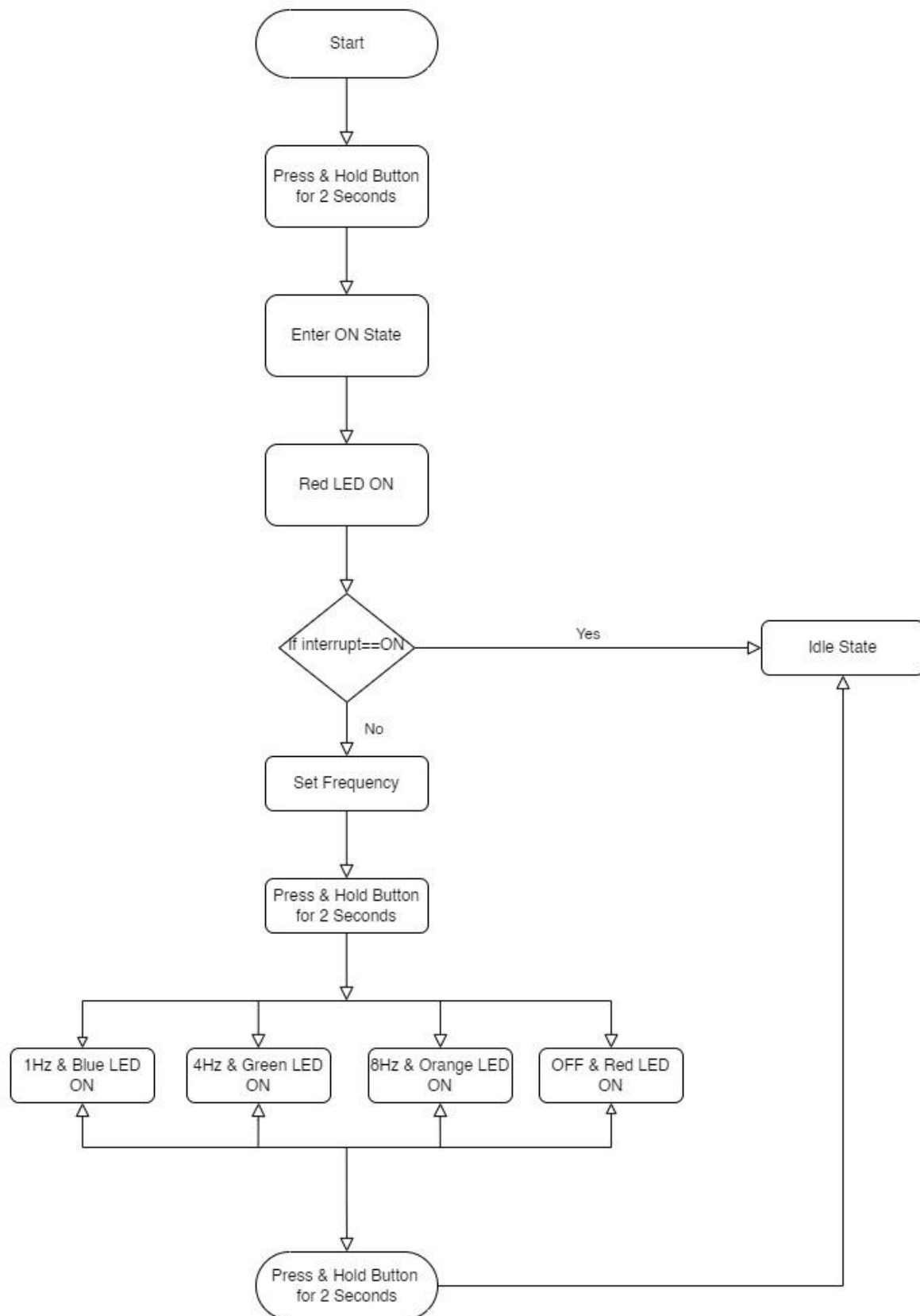
Figure 4 Behavior Diagram

Test Plan
High Level Test Plan

ID	Description	Output	Type of Test
HLTP_1	Press and hold the button to put the Ignition key position in ACC mode	System Enters ACC State	Requirement Based
HLTP_2	Different wiper frequencies to be set (1Hz, 4Hz & 8Hz)	Responds Based on Input	Requirement Based
HLTP_3	Hold the button to put the system in Idle state	Enters Idle State	Requirement Based

Low Level Test Plan

ID	Description	Output	HLTP ID	Type of Test
LLTP_1	Hold the button for 2 sec to bring the ignition key position at ACC mode	Red LED-ON	HLTP_1	Requirement Based
LLTP_2	Hold the button for 2 sec to go back to the Idle state	Red LED-OFF	HLTP_1, HLTP_3	Requirement Based
LLTP_3	Press the button one time to set frequency to 1Hz	Blue LED-ON	HLTP_2	Requirement Based
LLTP_4	Press the button second time to set frequency to 4Hz	Green LED-ON	HLTP_2	Requirement Based

ID	Description	Output	HLTP ID	Type of Test
LLTP_5	Press the button third time to set frequency to 8Hz	Orange LED-ON	HLTP_2	Requirement Based
LLTP_6	Press the button fourth time to turn OFF the wiper action	All LED OFF except Red	HLTP_2	Requirement Based
LLTP_7	Hold the button for 2 sec to bring ignition key position at Lock state	Red LED-OFF	HLTP_3	Requirement Based

Implementation and Summary

Git Link:

Link: https://github.com/GENESIS-2022/MasteringMCU-Team17.git

Individual Contribution and Highlights

1. Wiper System using C Programming
2. Source code management using GitHub

Role in Project Team

1. Programmer: Done Programming for Wiper System
2. Integrator: Integrated all the codes
3. Tester: Writing Testcases and testing the integrated code

Module: - Overview of Automotive Systems.

Date: - Jan 18th to 21st.

Team/Individual: - Team.

Project topic: - MahindraXUV500.

Modules
1. Automotive Systems
2. Git

Requirements

In this Mahindra project we have taken following features. I have contributed to Door Lock System

Name	Ps No.	Topic
Tharageshwari Babu	40021061	Anti-Lock Braking System
Tamildurga Pari	40021023	Wiper Control System
Monisha Guruchandiran	40021054	Climate Control System
Anusha Upendar Gurram	40021029	Door Lock Control System

Design
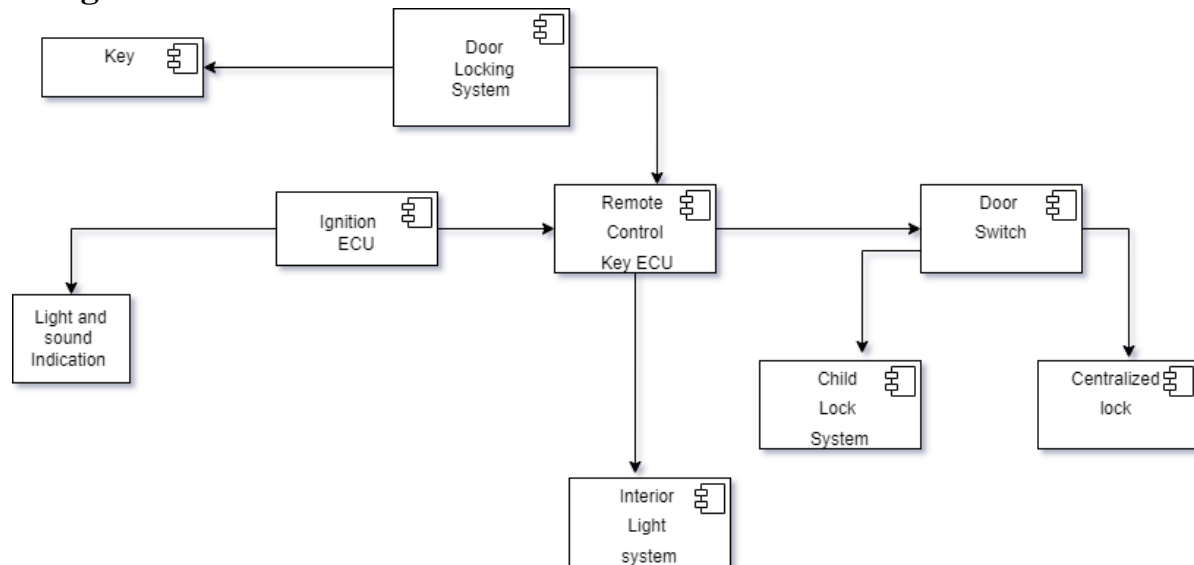
Figure 5 Structure Diagram

Implementation and Summary
Git Link:
Link: https://github.com/Tamil-durga-Pari/M1_Automotive-System-MahindraXUV500.git
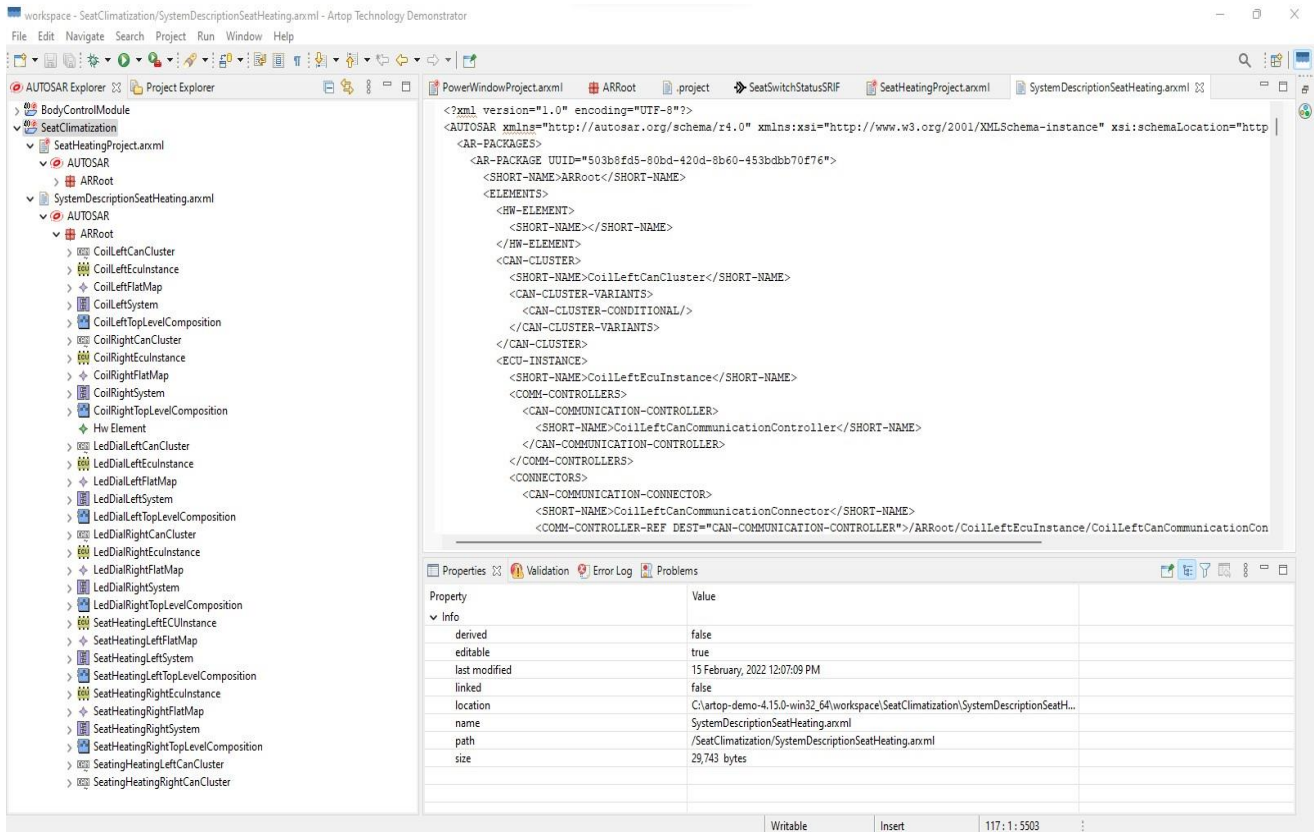
Individual Contribution and Highlights
1. Central Door Lock System case study
2. Source code management using GitHub

Role in Project Team

1. Designer: Done Designing for Project
2. Researcher: Done case study for Central Door Lock System

ASSESSMENT:-

Seat Climatization:-

Module: - Applied Control Systems & Vehicle Dynamics.

Date: - Feb 1st to 3rd.

Team/Individual: - Team.

Project topic: - GOLF CART.

Modules
1. Mat lab
2. Applied Vehicle dynamics

Requirements

EZGO marathon Vs YAMAHA UMAX rally 2+2:

Motor Specifications:

Component	EZGO marathon	Y- UMAX rally 2+2
Engine Type	350cc twin cylinder unit 18 cubic inches	402cc low-emission single cylinder 60 degree incline OHV
Fuel Tank Capacity	Twin cylinder unit	5.2US GAL (20 LITERS)
Top speed	12-14 Nm	15 mph (24.1 km/hr)
Minimum Turning Radius	4.24m	3.98m
Maximum Forward Speed	12mph (19.3 km/h)	15mph (24.1 km/h)

Battery Specifications:

Component	EZGO marathon	Y- UMAX rally 2+2
Battery Type	Works on gas cylinder	Lithium-ion
Range	25-30 miles	35 miles
Battery Charging Time	Works on gas cylinder	4 Hours
Battery Capacity	Works on gas cylinder	2 kWh
No of Cells	Works on gas cylinder	20,500

Wheel Specifications:

Wheel Type	EZGO marathon	Y- UMAX rally 2+2
Front Wheel Size	10 inches	12 inches
Rear Wheel Size	11 inches	12 inches
Front Tyre Size	22*9-11*10.5 - ply monitor k272	23*10.5-12*4- ply monitor k389

STRUCTURE AND SPECIFICATIONS

Whole structure:
① top roof
② sand box
③ cool box
④ rear tire cover
⑤ side mirror
⑥ windshield
⑦ windshield frame
⑧ head light/R
⑨ front bumper
⑩ front cover
⑪ head light base/L
⑫ side cover sheet
⑬ rear body cover
⑭ steering wheel
⑮ steering column
⑯ combination switch
⑰ power indicator
⑱ brake padel
⑲ key switch
⑳ switch F/R
㉑ accelerator pade
㉒ armrest
㉓ front tire
㉔ rear tire
㉕ tail light/L
㉖ rear bumper
㉗ tail light/R
㉘ Bag Strap Holde
㉙ ball washer

Range

Vehicle Model	Buggy
Colour	Wide range of Colour options
Usage/Application	Eco-friendly drive within enclosed campuses.
Seating Capacity	4-12 persons

Running Distance	40 Km/Charge
Maximum Speed	11KM/Hour
Brand	Maini
Material	Powder coated tubular steel Chassis,
Body frame	dent proof ABS
Number Of Battery	6 no, 8 Volt each, 150AH
Voltage	48V
Motor Rated	48 Volt AC Motor
Power	4 Kw Continuous
Speed	11KM/Hour
Seater	2-14 seater
Capacity Kg	200-1100 KG

Battery

Brand	Trojan
Capacity	@20Hr - 170Ah
Model Name/Number	Trojan Motive T-875 with Bayonet Cap
Voltage	8V
Battery Type	Deep-Cycle Flooded/Wet Lead-Acid Battery
Dimensions	10.27 x 7.10 x 11.14 Inches
Weight	29 Kg
Material	Polypropylene
Application/Usage	Golf cart, Low Speed Electric Vehicle

Report

STRUCTURE AND SPECIFICATIONS

(LT-A627·4)Whole car specifications (standard) :
detailed specification refers to actual contract

Electric system	controller	Curtis controller 1266A-5201/275A (USA Brand)
	battery	Lead acid battery 8V x 6pcs　140AH 5Hr Rate
	Motor	High efficient Sepex ADC 3.7 KW motor
	charger	Intelligent charger48V,20A
	Accelerator	Electrical accelerator 48V input, Hall output 0-5V

Body configuration	Wind shield	Organic glass	Top roof	ABS plastic vacuum forming
	Seat	Leather	Floor	Rubber sliding proof mat
	Side mirror	L & R side mirrors	Steering system	Two way positioning system,automatically backlash compensation
	Light&signal	48V/12-300W Front light, turning light, rear combo lights, horn, reverse buzz		
	Body	PP plastic injection	chassis	High tensile steel welding structure, electrophoresis treatment for anti-rust
	Dash board	PP plastic injection, power indicator, head light switch, turning light switch, key switch, F/R switch		
	Brake	rear drum + combo brake pedal parking		
	Front Suspension	Spring+hydraulic shock absorber, independent suspension		
	Rear suspension	Excellent transaxle, gear ratio 12.31:1, half independent suspension + hydraulic shock absorber		
	Wheel & tire	Steel wheel　18x8, 50-8+tire(452mm)		
	Loading staff	4 persons (including driver)		

1. specification
1.1dimension:L*W*H　　3160*1200*1800mm
1.2 wheelbase　　2410mm
1.3weight(including batter)　　510kg
1.4load capacity　　300kg
1.5max speed　　22-24km/h
1.6mileage　　70-90km/h (level road)
1.7min turning radius　　4m
1.8max climbing ability　　25%
1.9min clearance　　100mm
1.10brake distance　　<6m
1.11tread　　front900mm/rear 1000mm

2.battery specification
2.1battery type　　lead acid battery
2.2volume　　140Ah
2.3 voltage　　48V

3.motor specification
3.1motor type　　DC series motor
3.2rated power　　3.7kw
3.3rated rotating speed　　2500r/min
3.4 rated voltage　　48V
3.5rated currency　　105A
3.6ration　　15min

STRUCTURE AND SPECIFICATIONS

(LT-A627·4+2)Whole car specifications (standard) :
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	Front Suspension	Spring+hydraulic shock absorber, independent suspension		
	Rear suspension	Excellent transaxle, gear ratio 12.31:1, half independent suspension + hydraulic shock absorber		
	Wheel & tire	Steel wheel　18x8, 50-8+tire(452mm)		
	Loading staff	6 persons (including driver)		

1. specification
1.1dimension:L*W*H　　3520*1200*1800mm
1.2 wheelbase　　2410mm
1.3weight(including batter)　　590kg
1.4load capacity　　450kg
1.5max speed　　22-24km/h
1.6mileage　　70-80km/h (level road)
1.7min turning radius　　4m
1.8max climbing ability　　20%
1.9min clearance　　100mm
1.10brake distance　　<6m
1.11tread　　front900mm/rear 1000mm

2.battery specification
2.1battery type　　lead acid battery
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PRE OPERATION

Pre-operation checks should be made each time you use your golf car. Get in the habit of performing the following checks in the same way so that they become second nature.

⚠ WARNING

Be sure that the main switch key is removed before performing the pre-operating checks to prevent accidental starting, and apply the parking brake to keep the car from moving.

PRE-OPERATION CHECKLIST

Before each use, please check the following

√ Batteries
√ Tire condition
√ Steering system
√ Back-up buzzer
√ Pedal operation
√ Body and chassis

SEAT

Opening the seat for checking and servicing

PRE OPERATION

BATTERY

Charge batteries before every use. See charging steps in chapter 6.
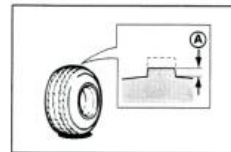
Check that the batteries are held securely in place to prevent the batteries from vibration or jarring. Also check that no prevent battery acid from spilling from the battery. Check the battery terminals for corrosion.

TIRE CONDITION

Check the tire air pressure before the operation of car.
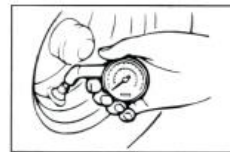
Tire pressure
25PSI grass/dirt
36 PSI road

Tire wear limit
Check the tire surface for damage, cracks or embedded objects. When tire tread wears down to 0.04(1mm), replace the tire.

Ⓐ Wear limit

OPERATION AND CONTROL

Turning On Main Switch
1,Shifting the switch to RUN position then can turn on the power supply of car.
2,Shifting the switch to OFF position then can turn off the power supply of car.

Key Switch
1、Plugging in the key and turn right then can turn on the key switch(Note:Shifting the F/R switch to the middle position before turning on Main switch).
2、Turning left and then can turn off the switch.Switch can be removed only at this state.

Forward/Reverse Switch
The Forward/Reverse Switch is used to shift the car to forward,reverse or stop.Forward for upward,Reverse for downward,Park for middle.When choosing reverse switch,the reverse buzzer sounds.

Completely stopping car before shifting F/R switch.When shifting F/R switch,please turn switch to middle positon for 2s at first,then choosing Forward switch or Reverse switch.Don't shifting F/R switch in a hurry in case that the sensor will be burnt or switch will be out of use.

OPERATION AND CONTROL

Voltage Indicator
Voltage Indicator is to show the electricity and remains custom to charge on time.The voltage will shows fulled charged when charing enough time.
1、Electricity display reduce with the consumption of electricity during working;
2、When electricity is close to little electricity warning,it was showed by moving between first space and second space;
3、When electricity enters into under-electricity warning,it was displayed by flashing of first space in left.

Head light switch

Turning light switch

Accelerator pedal
Turn on the key switch, choose forward or backward, release brake, put your right foot on the accelerator pedal, soft step down the pedal to start the car.
Attention: don't step down the pedal to the end in rush.

Implementation and Summary

Submission: Submitted in GEA Learn

Individual Contribution and highlights

1. Done in Matlab Script

L&T Technology Services

Module: - Autosar basic to Intermediate.

Date: - Feb 1st to 15th.

Team/Individual: - Individual.

Project topic: - MahindraXUV500.

Modules
1. Autosar
2. Git

Requirements

| S.NO	Function	Description
1	Engine	The Engine Should be ON to Use the Parking System
2	Reverse Gear	Car Should be in Reverse Gear to Enable Parking System
3	Assistive Mode	Assistive Mode Can Be Enabled or Disabled
4	Assistive Mode ON	If Assistive Mode is ON the Sensor Assists
5	Assistive Mode OFF	If Assistive Mode is OFF the Sensor Will not Assist
6	Sound Frequency	Sound Frequency Varies Based On The Object Distance

Design
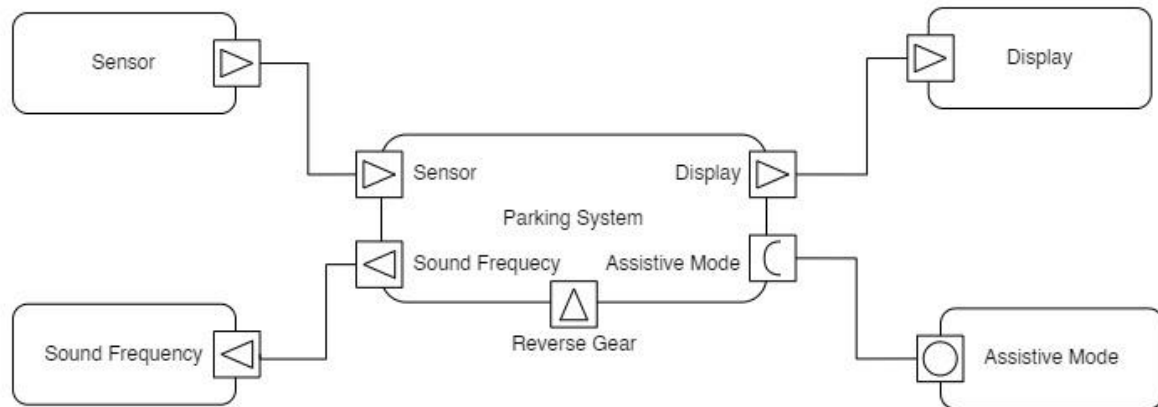
Figure 6 VFB Diagram

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Individual Contribution and Highlights

Tharageshwari Babu	40021061	Anti-Lock Braking System
Tamildurga Pari	40021023	Wiper Control System
Monisha Guruchandiran	40021054	Climate Control System
Anusha Upendar Gurram	40021029	Door Lock Control System