POLITEKNIK MALAYSIA
SULTAN SALAHUDDIN ABDUL AZIZ SHAH

DEE40082 PROJECT

PROJECT PROPOSAL

TITLE :

OPEN LOOP AND CLOSED LOOP TRAINER

SESSION JUN 2019 | DJK4A

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CHAPTER 1
INTRODUCTION

1.1 Introduction

An open-loop control system is one in which the control action is independent of the output. Meanwhile, Closed-loop control systems are more commonly called feedback control systems. Feedback is the characteristic of closed-loop control systems which distinguishes them from open-loop systems. It is the property of closed-loop control systems which permits the output to be compared with the input of the system so it may form the control action as a function of the output and input. Feedback is said to exist in a system when closed sequence of cause-and-effect relation exists between system variables.

1.2 Background Research

The main difference between an open-loop system and a closed-loop system is that the closed-loop system has the ability to self-correct while the open-loop system doesn't. Consequently, closed-loop systems are often called feedback control systems while open-loop systems are also known as non-feedback controls.

1.3 Problem Statement

The purpose of this project is to help all students involved in the control system topics to facilitate their understanding of the concept of open loop and closed loop. Student don’t get the impression and don’t understand what open loop and closed loop system. some students cannot understand what their teacher is teaching and cause them to misunderstand what their teacher is saying.Another that,student cannot compare the type of control system between open loop system and closed system because students do not understand what control system they do not know how to distinguish the open loop and the closed loop system until they are confused about what the machine is using.

1.4 Research Objectives

The main objective of this project is to help students understand the loop control system. In addition, it also aims to help lacturers teach on this topic.

More specifically the principle objective of this research are:

1. To design a circuit that works and is suitable for the learning system and can serve as a trainer.
2. To implement a machine that can help students understand the control system
3. To develop a machine that can serve as a learning aid that facilitates the learning system..

1.5 Scope of Research

This project is focusing about software and hardware

The emphasis is controller and programming .

The main controller is using ARDUINO UNO R3

1.6 Project Significance

This project has been done by several people before, so what we can see is the difference between this project and they are the IoT project to turn on and off the supply.

1.7 Chapter Summary

To summarize, the project aims to help students understand basic control topics related to open loop and closed loop. In addition, this project can help teachers teach more easily. This project has two circuits. The first is the open loop and the second is a closed loop.This project is focusing in two main part which is one is hardware part and the other one is software part.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The purpose of this project is to help all students involved in the control system topics to facilitate their understanding of the concept of open loop and closed loop. In addition,this project will also help teachers teach this topic. In addition,the project will also help them identify whether the machine is using an open loop system or closed loop system.Finally,it can also provide students with insights to help students use both systems in future year-End Projects.

2.2 control System

Control System theory has played an important role in formulating the theoretical basis for understanding how a system work. A control system is an interconnection of components forming a system configuration that will provide a desired system response. The basis for analysis of a system is the foundation provided by linear system theory, which assumes a cause-effect relationship for the components of a system

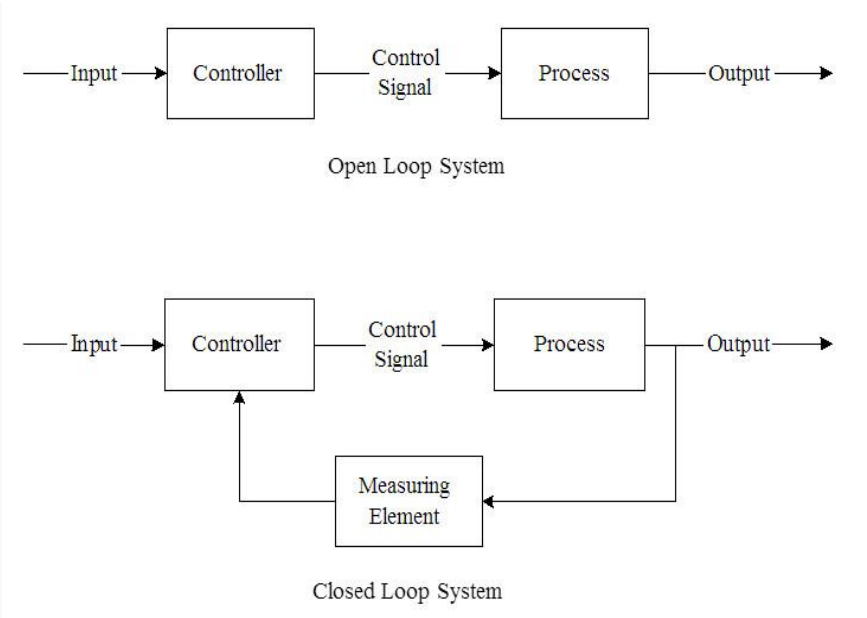


Figure 2. 1: Block diagram of open loop and closed loop system

2.2.1 Microcontroller

A microcontroller is a computer present in a single integrated circuit which is dedicated to perform one task and execute one specific application.It contains memory, programmable input/output peripherals as well a processor. Microcontrollers are mostly designed for embedded applications and are heavily used in automatically controlled electronic devices such as cellphones

2.2.2 Arduino

Arduino refers to an open-source electronics platform or board and the software used to program it. Arduino is designed to make electronics more accessible to artists, designers, hobbyists and ayone interested in creating interactive objects or environments. An Arduino board can be purchased pre-assembled or, because the hardware design is open source, built by hand. Either way, users can adapt the boards to their needs, as well as update and distribute their own

CHAPTER 3

RESEARCH METHODOLOGY

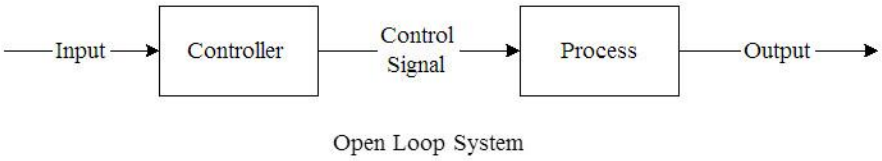
3.1 Introduction

In order to realize this project as a product that ready to use with safety characteristic, a very comprehensive plan is undertaking. A step by step procedure is done so that the project can be completed in time. This include collecting data of sample children finger, design the mechanical part, circuit design testing and verification.

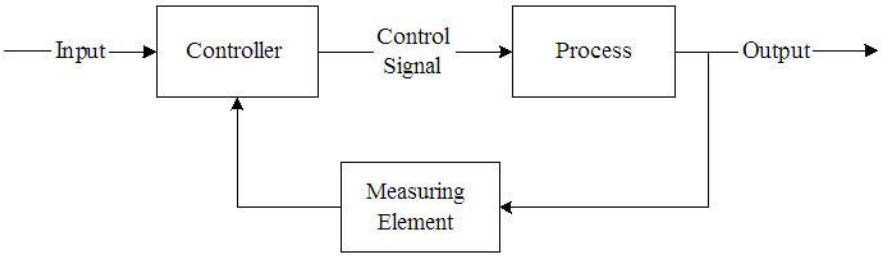
3.2 Project Design and Overview.

As mentioned in the previous chapter, the main controller is using Arduino. The design of the controller circuit using Arduino realizes using Proteus Software to make sure it runs the circuit as we desired.

3.2.1 Block Diagram of the Project



Open Loop System



Closed Loop System

3.2.2 Schematic Circuit

Figure 3. 1shows the overall circuit diagram of this project

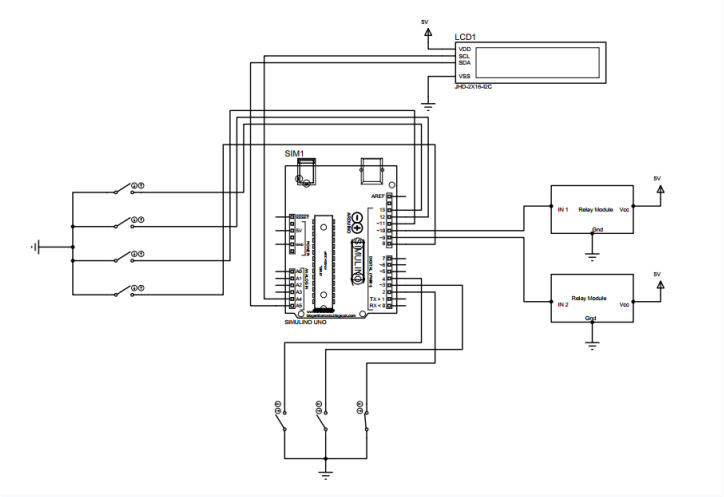


Figure 3. 1: Circuit Diagram

*Images may be subject to copyright

3.2.3 Description of Main Component

The Arduino Uno R3 is a microcontroller board based on a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs). Programs can be loaded on to it from the easy-to-use Arduino computer program.

3.2.3.1 Component 1: THERMISTOR

Elements of a Thermistor. A thermistor is an electrical resistor whose resistance is greatly reduced by heating, and it is used for temperature measurement and control. Thermistor elements vary in both form factor and in their resistance versus temperature characteristics

3.2.3.2 Component 2 :LED

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device.

3.2.4 Circuit Operation

When the power supply is connected and the thermistor heated the LED will turn on and the LED will become brighter as the temperature on the thermistor increases. IoT is used to close the current flow if students forget to turn off the trainer.

3.3 Project Software

The software that is use in this project is Proteus 8 software.This software is being used to simulate the circuit of our project to make sure the circuit is successfully work and can be run in this software.The other one is arduino software.The applications is being used as a platform to give command.

3.4 Prototype Development

For prototype development,we have done some part in our mini project.In this mini project the components that included PIR sensor ,arduino, and LED.

3.4.1 Mechanical Design/Product

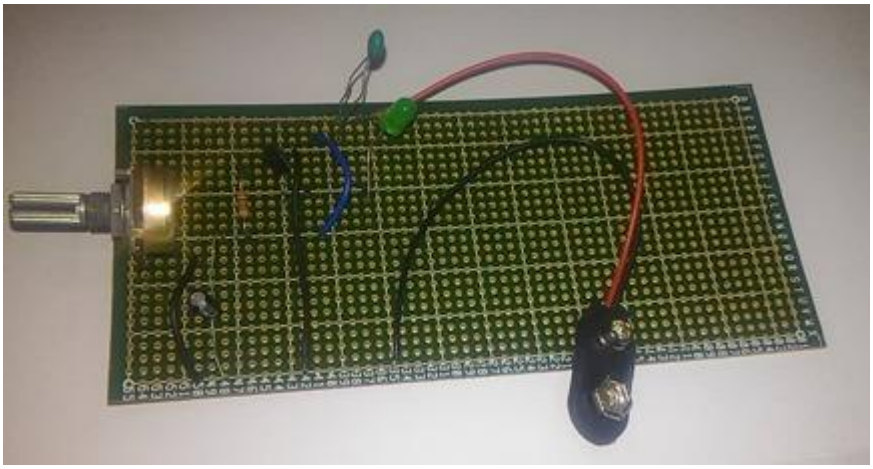


Figure 3. 2: Front view of the project

3.5 Sustainability Element in The Design Concept

In this sub-topic student should elaborate on the design criteria of their project either environmental design criteria, social design criteria use of sustainable design tool or economic design criteria.

3.6 Chapter Summary

In this chapter we are more focusing more to the project design and overview over flowchart and block diagram of the project plus the prototype of the project.Besides,in this chapter is focus on the the point of the components that is being used in the project.

CHAPTER 4

PROJECT MANAGEMENT AND COSTING

4.1 Introduction

In this attachment we are more focusing more to costing and management which is the cost and budget and the cost that is being used and calculated in this project and the time taken is taken to complete all the assesment that is needed in this project in gant chart plus to cleared see the process it can be seen in milestone section.There the costing and the time taken will be shown in milestone

4.2 Gant Chart and Activities of the Project

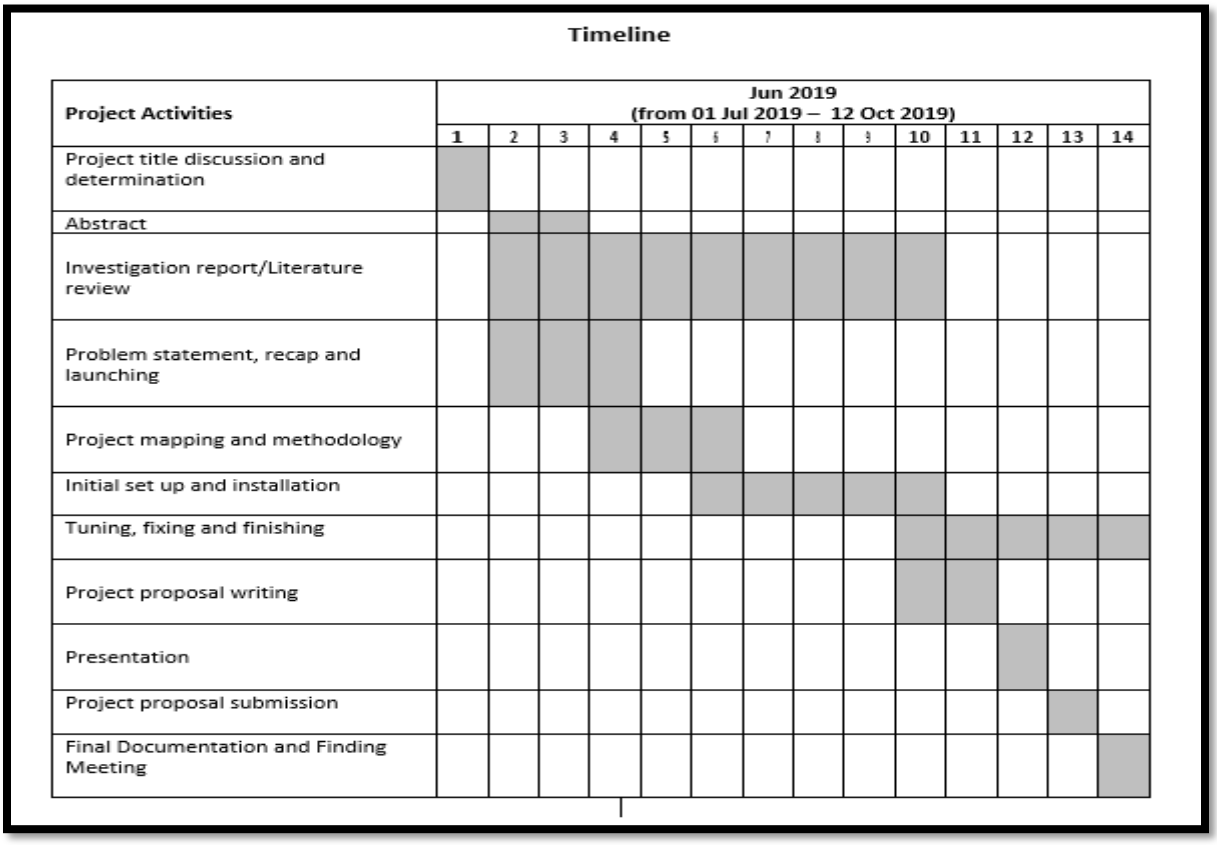
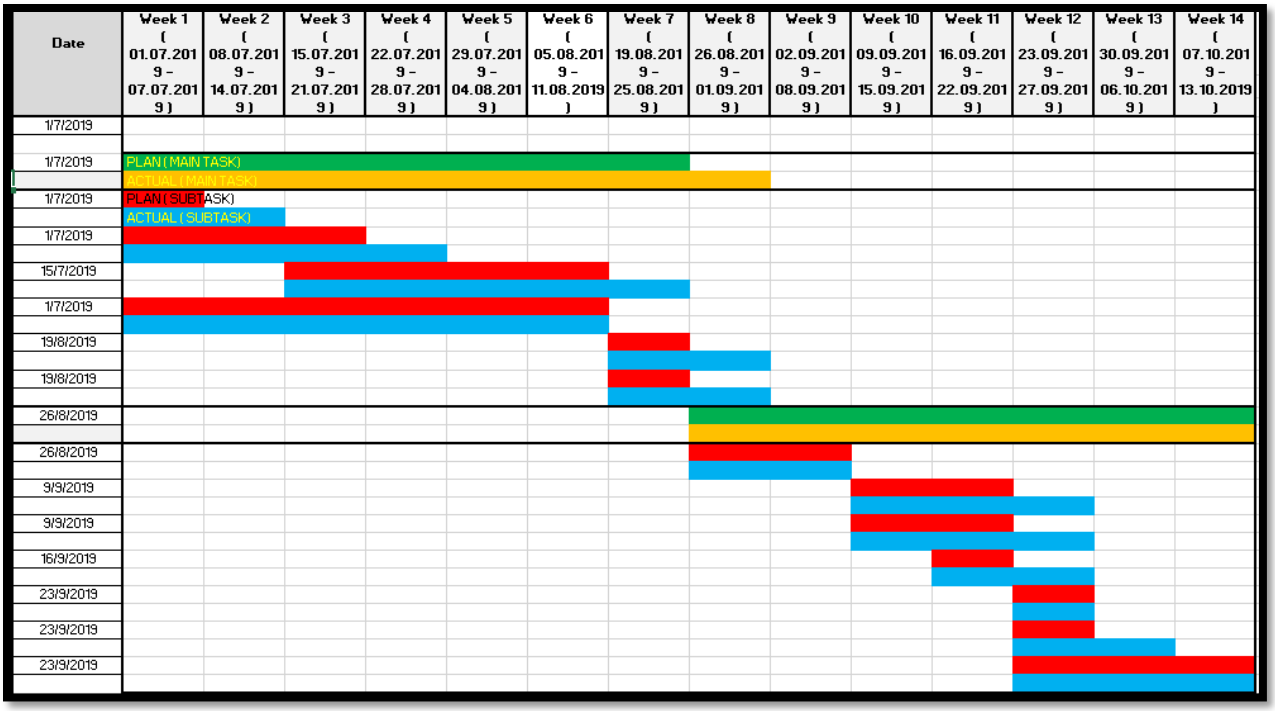


Table 2. 1: Gant Chart

4.3 Milestone

Course	No	Task Name	Implementation	Duration (Days)	Cost (RM)	Date
DEE40082 PROJECT 1	1	**TEMPERATURE AND HUMIDITY MONITORING SYSTEM USING IOT**	**Plan**	**98**	**50.00**	
			Actual		**73.00**	
	2	START	**Plan**	0 days	0.00	1/7/2019
			Actual			
	3	**INVESTIGATION REPORT**	**Plan**	**49**	**0.00**	1/7/2019
			Actual	**56**	**0.00**	
	4	FIND INFORMATION ABOUT A PROJECT THAT RELATED TO INDUSTRY AND IR 4.0	**Plan**	7	0.00	1/7/2019
			Actual	14	0.00	
	5	PRESENT 3 SELECTED PROJECTS TO LECTURER	**Plan**	21	0.00	1/7/2019
			Actual	28	0.00	
	6	SEARCH ONLINE THE LITERATURE REVIEW	**Plan**	28	0.00	15/7/2019
			Actual	35	0.00	
	7	DRAW A FLOWCHART OF PROJECT FLOW	**Plan**	42	0.00	1/7/2019
			Actual	42	0.00	
	8	DRAW THE SCHEMATIC CIRCUIT OF THE PROJECT	**Plan**	7	0.00	19/8/2019
			Actual	14	0.00	
	9	PREPARE AND SUBMIT THE INVESTIGATION REPORT	**Plan**	7	0.00	19/8/2019
			Actual	14	0.00	
	10	**PROJECT PROGRESS(DESIGN,FABRICATE,INSTALL,TESTING)**	**Plan**	**49**	**50.00**	26/8/2019
			Actual	**49**	**73.00**	
	11	PURCHASE COMPONENTS AND MATERIALS	**Plan**	14	50.00	26/8/2019
			Actual	14	73.00	
	12	CONSTRUCT GRAPHICS/ TABLES/ DIAGRAM FLOWCHART/ALGORITHM/PROGRAMMING/CODING	**Plan**	14	0.00	9/9/2019
			Actual	21	0.00	
	13	PRODUCE CIRCUIT SCHEMATIC AND CIRCUIT SEMULATION	**Plan**	14	0.00	9/9/2019
			Actual	21	0.00	
	14	PRODUCE PCB DESIGN LAYOUT	**Plan**	7	0.00	16/9/2019
			Actual	14	0.00	
	15	PRODUCE PCB USING ETCHING OR CNC MILING	**Plan**	7	0.00	23/9/2019
			Actual	7	0.00	
	16	SOLDERING TOOLS AND TECHNIQUE	**Plan**	7	0.00	23/9/2019
			Actual	14	0.00	
	17	COMPONENT AND CIRCUIT TESTING	**Plan**	21	0.00	23/9/2019
			Actual	21	0.00	
	18	**DOCUMENT WRITING REPORT(FINAL PROPOSAL& LOGBOOK)**	**Plan**	**91**	**0.00**	8/7/2019
			Actual	**91**	**0.00**	
	19	WRITING THE FINAL PROPOSAL	**Plan**	42	0.00	2/9/2019
			Actual	42	0.00	
	20	WRITING THE LOGBOOK	**Plan**	70	0.00	8/7/2019
			Actual	77	0.00	

Table 2. 2: Milestone



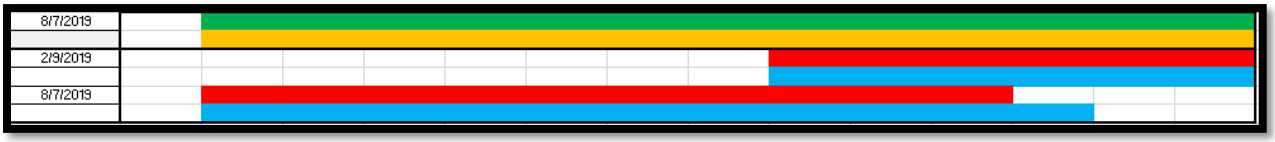


Table 2. 3: Milestone Bar

4.4 Cost and Budgeting

My project estimation involves the purchase of goods or components either to test the circuit before it has a live circuit. The goods purchased are as follows ...

Component/item	Price(Rm)	quantity	Total
Arduino uno	30	1	30
NodeMcu	20	1	25
Wire jumper	3	3	8
breadboard	12	1	12
Wifi module ESP8266	15	1	15
Led	0.30	4	1.20
capacitor	1	1	1
resistor	1	1	1
Battery 9V	5	2	10
			103.20

Table: Cost estimation of project

4.5 Chapter Summary

To summarise in this section it shows how many week does it takes to complete all the assesment above and to complete the project .It took for over 14 weeks to complete the project and all the costing that is used in this project is an about RM103.20.

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