



AUTOMATIC CENDOL DISPENSER MACHINE

REPORT FINAL YEAR PROJECT

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We confirm that the project report is submitting are entirely of our own work and that any material used from other sources has been clearly identified and properly acknowledged and referenced.

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ABSTRACT

Cendol is the one of the famous traditional food in Malaysia. During a hot day, cendol get the highly demand from the customer. The traditional method is use by the villages to produce cendol. And this traditional method unable to fill many requests from customer in the same time. Therefore, this project was proposed to develop the Automatic Cendol Dispenser Machine that can prepared cendol automatically control by the controlling system. This machine will develop by using Mega Arduino to control the timer of motor and sensor. In this project the obstacle sensor and DC pump motor has been used in the filling process. The specific container contained with section. All the ingredient automatically dropped as it controlled by the timer. This project which is Automatic Cendol Dispenser Machine also will be able to help the cendol seller in this country to increase their cendol production at the same time can be reduce the human power. Among other aspects it is also can help seller they do not need to hire people to expand their business with this machine.

Key word: Mega Arduino, Obstacle Sensor and DC Pump Motor, Timer

ABSTRAK

Cendol adalah salah satu makanan tradisional yang terkenal di Malaysia. Pada musim panas, cendol mendapat permintaan yang sangat tinggi daripada pelanggan. Kaedah tradisional digunakan oleh penjual untuk menghasilkan cendol. Dan kaedah tradisional ini tidak dapat memenuhi banyak permintaan dari pelanggan pada masa ke sama. Oleh itu, projek ini dicadangkan untuk membangunkan Mesin Dispenser Automatik Cendol secara automatik oleh sistem pengawalan cendol. Mesin ini akan dibangunkan dengan menggunakan Mega Arduino untuk mengawal masa motor dan sensor. Dalam projek ini, sensor halangan dan motor pam DC telah digunakan dalam proses pengisian. Mesin ini juga mempunyai bekas khusus yang mengandungi seksyen. Semua bahan secara automatik jatuh ke dalam mangkuk dan dikawal oleh pemasa. Mesin Automatik Cendol Dispenser juga akan dapat membantu penjual cendol di negara ini untuk meningkatkan pengeluaran cendol mereka pada masa ke sama dapat mengurangkan tenaga manusia. Antara aspek lain, ia juga boleh membantu penjual kerana mereka tidak perlu lagi mengupah pekerja untuk mengembangkan perniagaan mereka dengan adanya mesin ini.

Kata kunci : Mega Arduino, Obstacle Sensor and DC Pump Motor, Timer

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CHAPTER 1

INTRODUCTION

1.1 Background

Semi-auto Cendol Maker is an alternative machine that capable to help the cendol seller in Malaysia. In this country, cendol seller faced a lot of problem to produce a cendol. There are many problems that they faced for an example, they have to produce cendol by manual. From that, they need to hire people to meet customer demand in one period of time. Due to that, this project was proposed to develop the Semi-auto Cendol Machine that will prepared cendol automatically control by the controlling system. Among the features of this machine was we use the sensor to fill the ingredients of cendol. The ingredients such as cendol, bean, corn, coconut milk and gula melaka. This machine is able to automatically fill the cendol ingredients directly. This machine will develop by using Mega Arduino to control the timer of motor and sensor.

In this project also we used the stepper motor and servo motor to fill the ingredient of cendol to fill in specific container and it will be drop automatically according to the timer that control by Mega Arduino. So that the ingredient will fill smoothly to the bowl. In other words, this machine is created to facilitate the process of filling the cendol ingredients, saving time and producing cendol with cleanliness more assured. We have obtained information from several cendol entrepreneurs where they still use the traditional way to fill the ingredients of cendol. The way they are used is hard. This is because the process of filling this cendol was requires more attention during the execution. In addition, we have also conducted an observation by looking their own way produce cendol and fill the cendol ingredients in a traditional way. Some aspects such as the time and energy consumption in producing cendol is not professional and difficult.

1.2 Problem Statement

From our observations and questionnaires that we already done. We found many problems that faced by cendol seller in particular to running their business. Among the problems that often faced by some cendol entrepreneurs is when the filling ingredients process. It is because the filling process that they use is a manual process. In other words was they need to fill all the ingredient by themselves. It's become worst when they were facing a lot of customer in one period of time. Sometimes, they unable to full fill the customer demand toward their cendol. Customer also needs to wait for such a long time until it done.

Due to that, the filling process by manual requires at least two people to do the process. One person needs to grind the ice and the other person needs to fills the cendol ingredients in a bowl. Time taken too long enough to prepare the cendol. In fact, requires a lot of human energy. What we can conclude was a long period of time taken can make a small quantity of cendol .

1.3 Objective

There several objectives should be achieved at Automatic Cendol Dispenser Machine. The objectives as follows;

- i. To develop the Automatic Cendol Dispenser Machine
- ii. To create a controller system using sensor and mega arduino
- iii. To analyze the performant machine

1.4 Scope Of Project

Our main project is for;

- i. Cendol Seller
- ii. The person who want to make many cendol

1.5 Significant Project

The significant of our project is;

- i. Able to detect a bowl.
- ii. Able to grinding ice by automatic using DC Motor
- iii. The process of filling ingredient did by automatic

1.6 Overview

The purpose for this project is developing the Automatic Cendol Dispenser Machine for cendol seller that able to fill and grinding ingredient and ice by automatic. We already collect all information about cendol seller and also customer in Malaysia and get the result by interview themselves. After the product done develop, testing the product on cendol seller and get the result. Then, the analysis was done basis on the result and make a graph. If the graph shows positive response, so that, this result is validated.

1.7 Outline of Project

Chapter 1 gave an introduction about the project as well as problem statement, objective and project scope for project.

Chapter 2 is a literature review where the main part of Blindness Shoes will be describes and understanding all components that will be used for this project. The purpose of this chapter is to provide an overview the scope of study for this project.

Chapter 3 is methodology section where the methods or steps that have been used to approach to water monitoring system will be explained thoroughly.

Chapter 4 is the result and discussion where all the result of the analysis will be shown. Discussion and observation of the outcome of the research in relation to evidence obtained from project and theories will be made in this chapter.

Chapter 5 is conclusion for this project, which describe the overall project based on the observation of the result obtained and summarize the entire project. This chapter also discuss the recommendation for future planning.

CHAPTER 2

LITERATURE REVIEW

2.1 Background

Automatic Machine is defined a machine or machine tool (such as a spinning machine or lathe) that after once being set operates automatically except for applying the power, lubricating, supplying material, and shutting off the power . **Dispenser** is defined as The actual meaning of the word dispenser in mechanics may refer to-an automatic machine or container which is designed to release a specific amount of something

2.2 Long queues for durian cendol in Shah Alam... but it's worth it! BY LEE KHANG YI



Figure 2.1.1: the bowl of cendol

SHAH ALAM, May 6 — The queue for Rojak & Cendol Shah Alam’s durian cendol started at 5.30pm even though people had been hovering around from as early as 4.30pm.

This is about one and a half hours before the stall opens for business at 6pm! By the time the stall opened, there was a snaking queue of around 30 people at the food court.

Some like Nor Akma who had come all the way from Titiwangsa read about it on Facebook. She arrived about 3pm thinking that she would get a head-start but unfortunately the stall only starts business from 6pm onwards. By the time she got her takeaway durian cendol order, it was about 6.30pm. Three and a half hours later.

The durian cendol is famous as you are guaranteed real durian fruit in your cendol since it’s placed whole (with the seeds) into each bowl. The combination works well with the green cendol strands, shaved ice doused with the stall’s own gula merah syrup and santan sawit. A dollop of creamed corn is added into every bowl since it’s a more popular choice versus red beans, the usual ingredient paired with cendol.



Figure 2.1.2: Cendol seller prepared cendol with their employee

Opened about two years ago by Mohd Hafez Hamed and Khairul Fahmy Md Yasin, the stall offers more than 100 varieties of cendol, rojak and tauhu bakar. They offer “cendol moden”, their take on the traditional dessert with unusual toppings like cereals Koko Krunch and Honey Stars, marshmallows, raisins and chocolate.

Then there is “cendol fruity” where the popular choices are durian, sea coconut, lychee and mango.

Previously, they used to sell tauhu bakar at the Ramadan Bazaar in Section 18 Shah Alam, In mid-March, they launched their durian cendol.



Figure 2.1.3: The customers need to queue to buy cendol

On a daily basis, Jufri Masril from Ejop Durian Corner located at Jalan Raja Alang will deliver the durians. In the beginning, they were supplying 200 kilograms on a daily basis. With the good response, it's been increased to 270 kilograms each day.

On weekends, the order goes up to a whopping 300 kilogrammes! According to Hairul Khalifah Jamal, the brother-in-law of Mohd Hafez Hamed who is in charge of the takeaway counter, they want to ensure there's enough supply of durians as many customers come from as far as Penang, Johor and even Pasir Mas to try their durian cendol and they don't want them to return disappointed.

To cater to the stall's demand, Ejop Durian Corner makes trips to Thailand every few days to bring down their supply. In June when the durian season starts, you may find local variants like D24, Musang King and Udang Merah in your bowl of cendol; these will be charged according to the market prices.

Complementing the cendol is the usage of santan sawit or palm oil based "santan." Unlike coconut santan, according to research by the Malaysian Palm Oil Council, santan sawit is touted to be healthier since it's got lower levels of saturated fatty acids and it's trans-fat free.

2.3 CENDOL HISTORY

BY NAJIB ABDULLAH

cendol is the popular cold dessert from South East Asia- Malaysia, Indonesia, Philippines, Vietnam, Southern Thailand and Singapore. It is believed that this cold dessert derives its name from a word “jendol”. The word jendol in Javanese, Indonesian and Sundanese means “bulging” or “bumping”. Cendol, lives to up to its name in recreating the bumpy sensations that arises in the stomach when green-worm like jellies are swallowed. The Indonesians consider it as a refreshing drink.

Cendol Recipes- History

There is not much information about the origin or birth of this recipe. But the mention of cendol appears for the first time in the Malay concordance project which was published in 1932.

Cendol Recipes- Commonly Used Ingredients

Cendol is prepared using coconut milk and green worm-like jelly. The green worm- like jelly is prepared using the rice flour and green food coloring and the dish actually refers to the jelly. Some other ingredients such as creamed corn, red beans, grass jelly and glutinous rice may also be added. Different variations of cendol are popular around Southwest Asia. In Singapore you can enjoy cendol topped with durian or a scoop of vanilla ice cream. In Sunda at Indonesia the variant is greener than its Malaysian counterparts. The cendol in Sunda is prepared from syrup of areca sugar, coconut milk and rice flour worms or sago worms. The palm sugar, cendol and coconut milk mixture is called dawet in Javanese tongue.

Cendol Recipes- Serving and Eating Suggestions

In Malaysia Cendol is served in small bowl of rich coconut milk and shaved ice. The dessert is sweetened using thick brown colored sugar syrup derived from palm sugar. Alkaline water is added to cendol to make it smooth and bouncy.

Cendol Recipes - Types

Various types of cendol are enjoyed in South East Asia. Some of the famous varieties are:

- Cendol biasa (normal): This is a normal cendol recipe with coconut milk and green-worm jellies.
- Cendol pulut (glutinous rice): Cendol pulut is prepared using coconut milk and glutinous rice. The light green color of worm-like jellies comes from Pandan leaves.
- Cendol kacang: Cendol kacang is prepared using cendol, red bean and coconut milk.
- Cendol bandung: • Cendol jagung (sweet corn): Cendol jagung is prepared using cendol, sweet corn and coconut milk.
- Cendol campur (assorted): Cendol campur is prepared using cendol, pulut, sweet corn and red bean.

Cendol Recipes- Health and Nutrition Facts

Cendol gives you proteins, but it is quite high in fat, carbohydrates and calories. The coconut milk and condensed milk used in the preparation of cendol is rich in fats and sugar. Normally cendols are topped with palm sugar syrup which further adds to the fats, sugar and calories. It is not recommended for diabetic.

Cendol - Miscellaneous Facts

In Malaysia cendol is sold on carts by the Indian Muslim vendors.

2.4 Standard of food grade

FOOD GRADE PACKAGING

Because packaging and containers used to store food are in direct contact with the food, they need to be suitable and 'food grade'. If the packaging is made from inappropriate materials there is potential for it to make the food unsafe.

Suitable for intended use

The Food Standards Code details specific requirements for surfaces in contact with foods, including containers and packaging in which food is processed or stored. They must be:

- adequate for the production of safe and suitable food
- fit for their intended use.

For a food contact surface to be considered food grade it must be able to be effectively cleaned, and must be made from a material that will not migrate into, contaminate or taint the food. The requirements for a plastic to be considered food

levels in foods for certain compounds commonly used in making food packaging (e.g. tin in canned foods, acrylonitrile and vinyl chloride – used in the production of plastics – in any food).

The US Food & Drug Administration (FDA) maintains a database listing the approved food contact substances that have been demonstrated to be safe for their intended use.

Most containers will outline on the label whether or not it is food grade and what it is suitable for (such as the labels below). If no such indication is made on the label or you are unsure whether or not the

and effectively cleaned and, where necessary, sanitised.

Any container or packaging used to store food should be smooth, and free of cracks, chips, crevices, ridges or grooves that could harbour bacteria and hinder attempts to easily and effectively clean it. Any defects in a food contact surface can allow the build-up of food scraps, and harbour bacteria which can contaminate the food.

A food business must ensure that any food container or packaging they use is designed and constructed to withstand the effects of detergents, hot water and sanitising chemicals – this may limit the ability to reuse some types of containers.

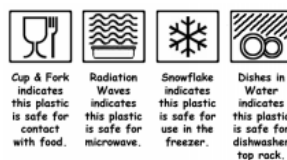
Cardboard or wood containers used as fruit and vegetable packaging should not be reused for unpackaged, potentially hazardous, ready-to-eat foods because these

grade are listed in the Australian Standard for Plastics materials for food contact use (AS2070-1999).

This Standard applies to manufacturers of plastics materials for food contact and specifies procedures to be used during the various stages of production. The requirements apply to such items as packages, domestic containers, wrapping materials, utensils or any other plastics items intended to come into contact with food.

The Food Standards Code also specifies the maximum allowable

container is food grade, either contact the manufacturer or assume the container is not food grade.



Can be effectively cleaned

Any surface that comes into contact with food must be able to be easily

ready to eat foods because these containers cannot be cleaned and sanitised effectively.

Made from suitable materials

Food contact surfaces must be made of material that will not contaminate food and are impervious to grease, food particles and water.

Containers and packaging must be made from materials that will not contaminate food by allowing chemicals to migrate from the packaging into the food, or by giving



Department of
Primary Industries
Food Authority

More resources at foodauthority.nsw.gov.au



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CHAPTER 3

METHODOLOGY

3.1 Background

The methodology is the method or procedures used for carrying out project in more specific. These methods are very important to ensure the completion of the project. The methods that are used including the project planning flow chart and collecting data components.

In this study, the information of Automatic Cendol Maker Machine has been collected according to the method through various kinds of journal, books and internet which is related to the project. This information has been used in developing the Automatic Cendol Maker Machine and complete final report appropriately

3.2 Planning of Project Automatic Cendol Dispenser Machine

In ensuring the Automatic Cendol Dispenser Machine can be done appropriately, a project is planning by using a Gantt charts has been prepared. In this Gantt chart, schedule of plan and subsequently report progress within the project environment has been stated clearly. Initially, in this project, the scope is defined with the appropriate methods for completing the project are determined.

3.2.1 GANTT CHART

This Gantt charts are used in this Automatic Cendol Dispenser Machine project to illustrate the start and finish dates of the terminal elements and summary elements of a project. A Gantt chart is used for project management, it is the most popular and useful ways of showing activities, task or events displayed against time. This Gantt chart has shown the task that need to be completed within the dateline. Every task need to mark on which number of week the task done will.

Table 3.1 and 3.2 shows a Gantt chart for two semesters which is semester 4 and semester 5. It shows the activities need to do every week. In the table, for the pink color for planning and the yellow color is when the activities has been do. As can see in semester 4 there are seven activities need to do in 15 weeks while in semester 5 it has seven activities in 15 weeks. In semester 5 more focus in build the PIPR project while in semester 4 it more to planning and design the Blindness Shoes project. There are few activities that had been done in the planning date and few activities are not. From this Gantt chart, it make every student to be more punctual in time when doing the work.

Table 3.2.1.1 : Gantt Chart Semester 4

WEEK/ ACTIVITY	LW 1	LW 2	LW 3	LW 4	LW 5	LW 6	LW 7	LW 8	LW 9	LW 10	LW 11	LW 12	LW 13	LW 14	LW 15
PROJECT															
BRIEFING															
GROUP															
FORMATION															
SUBMISSION OF															
PROJECT TITLE															
PROPOSED PAPER															
PREPARATION															
PRESENTATION															
PROGRES OF THE PROJECT															
REPORT															
PRESENTATION AND SUBMISSION PROJECT															

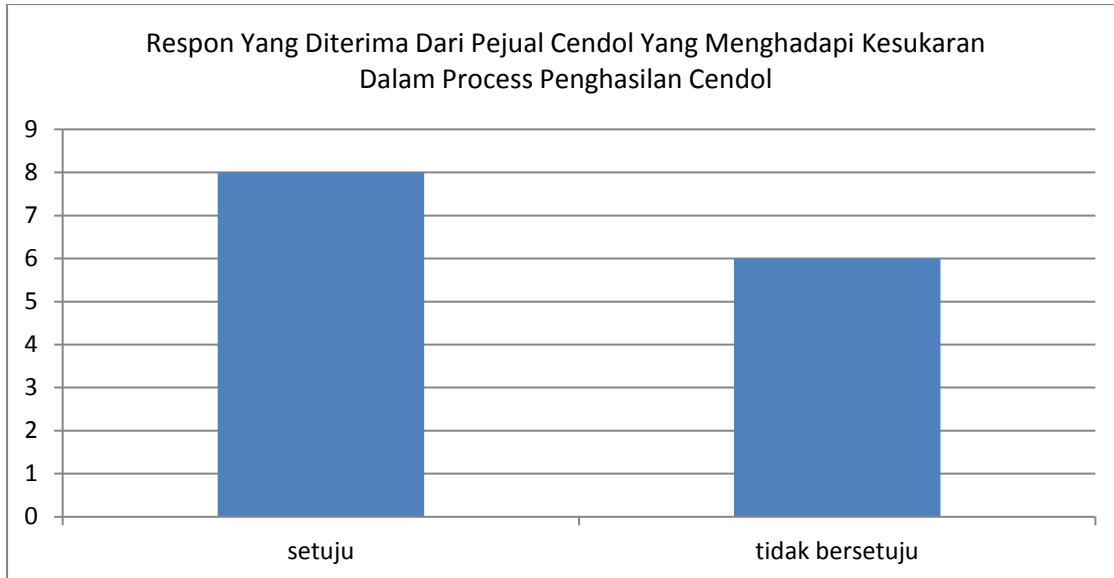
Table 3.2.1.2 : Gantt Chart Semester 5

WEEK/ ACTIVITY	LW 1	LW 2	LW 3	LW 4	LW 5	LW 6	LW 7	LW 8	LW 9	LW 10	LW 11	LW 12	LW 13	LW 14
DISCUSSION AND GUIDANCE														
BUILD THE MODEL														
TESTING AND TROUBLESHOOTING														
IMPROVING THE PROJECT														
PROJECT PRESENTATION														
SUBMIT LOG BOOK														
SUBMIT FINAL REPORT														

3.2.2 SURVEY AND INVESTIGATION

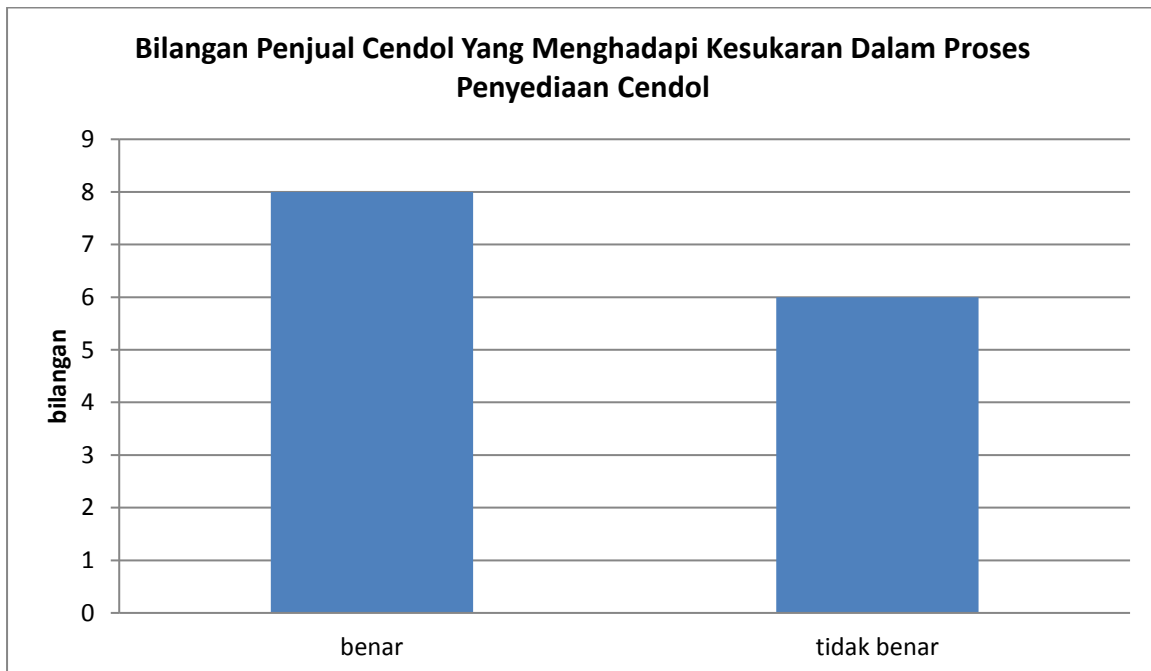
RESULT FROM FIRST QUESTIONNEIR

Q1: Berapa lama anda telah bekerja sebagai pejual atau pengusaha cendol?



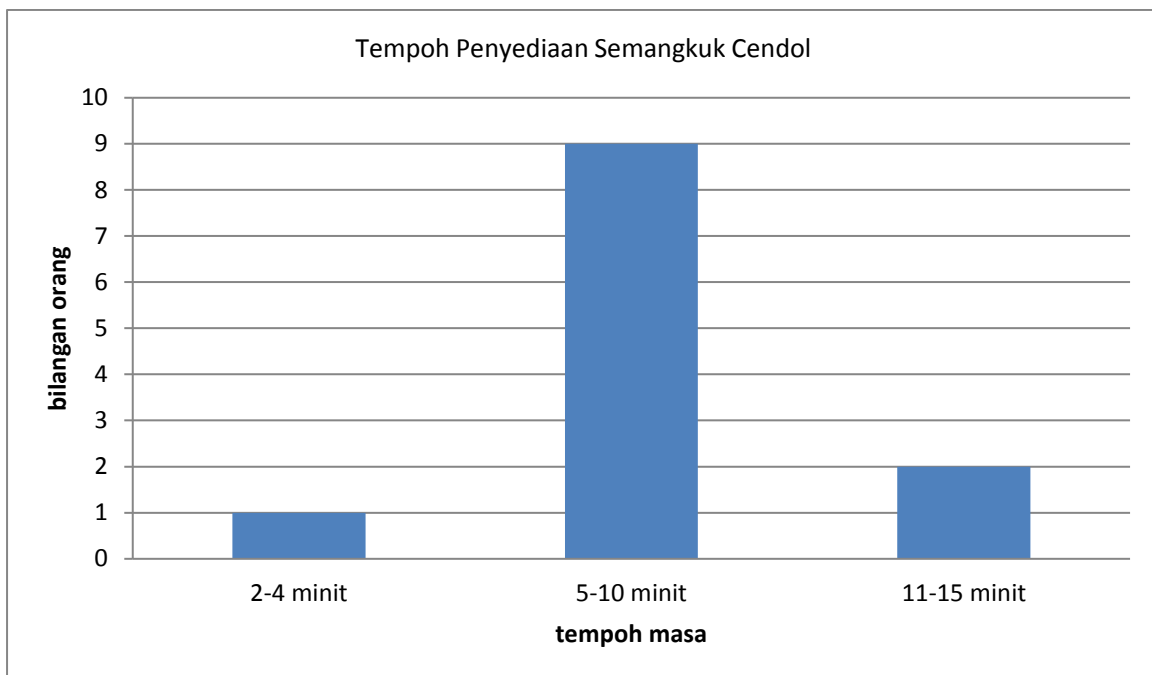
The bar graph shown that there are eight of our respondent who have stated that they faced a difficulty by preparing one bowl of cendol and another six of them didn't faced any difficulty to prepare a cendol.

Q2: Adakah tuan/puan menghadapi kesukaran dalam proses penyediaan cendol?



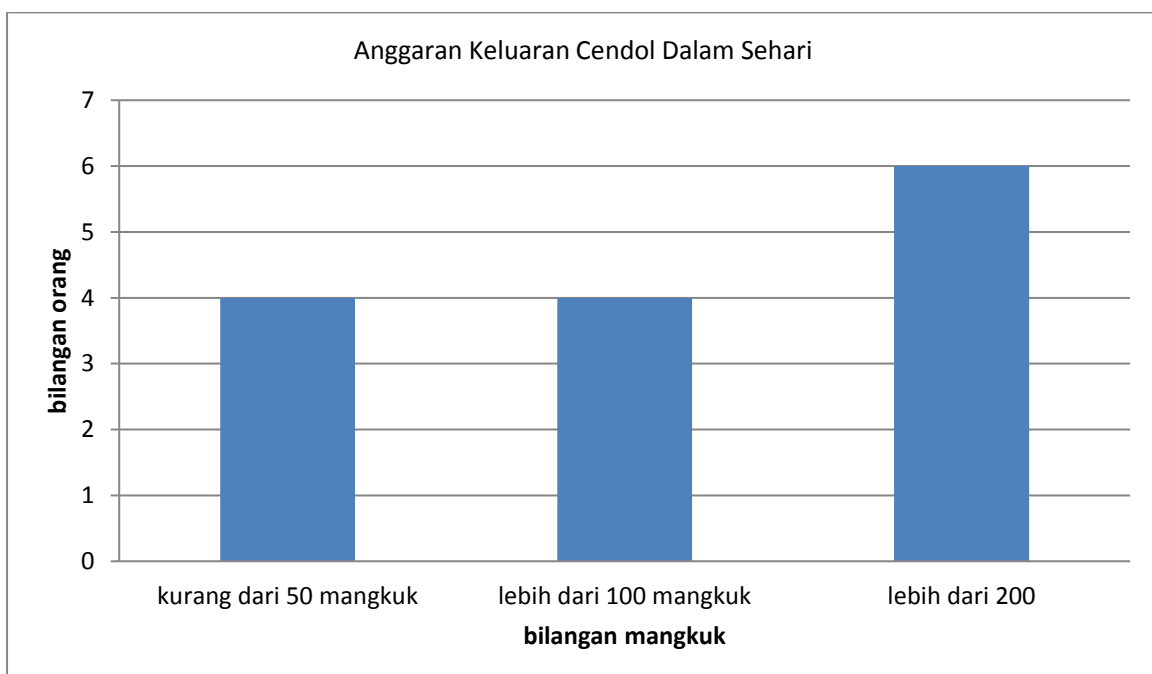
From the graph there are eight of our respondent who have stated that they have a difficulty by preparing one bowl of cendol and another 6 did not have any difficulty by preparing a cendol.

Q3: berapa lama anda mengambil masa untuk menyediakan semangkuk cendol?



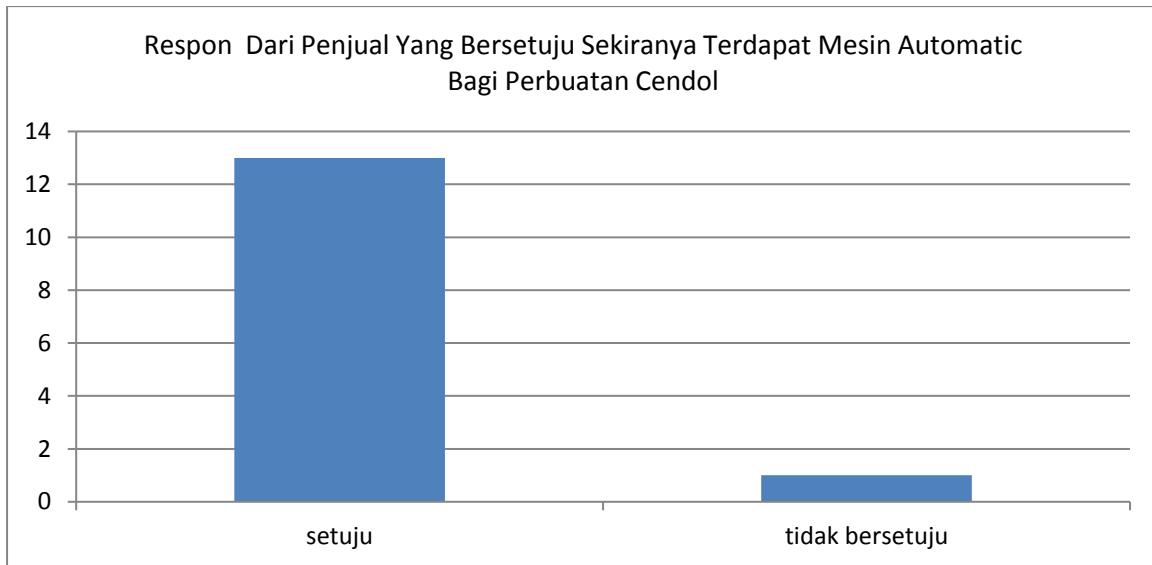
The bar graph shown there are only one of our respondent took only 2-4 minutes to prepare one bowl of cendol and 2 people took very long time which is 11-15 minutes . Futhermore, there are majority of them which is 9 people took 5-10 minutes.

Q3: berapa anggaran keluaran cendol dalam sehari?



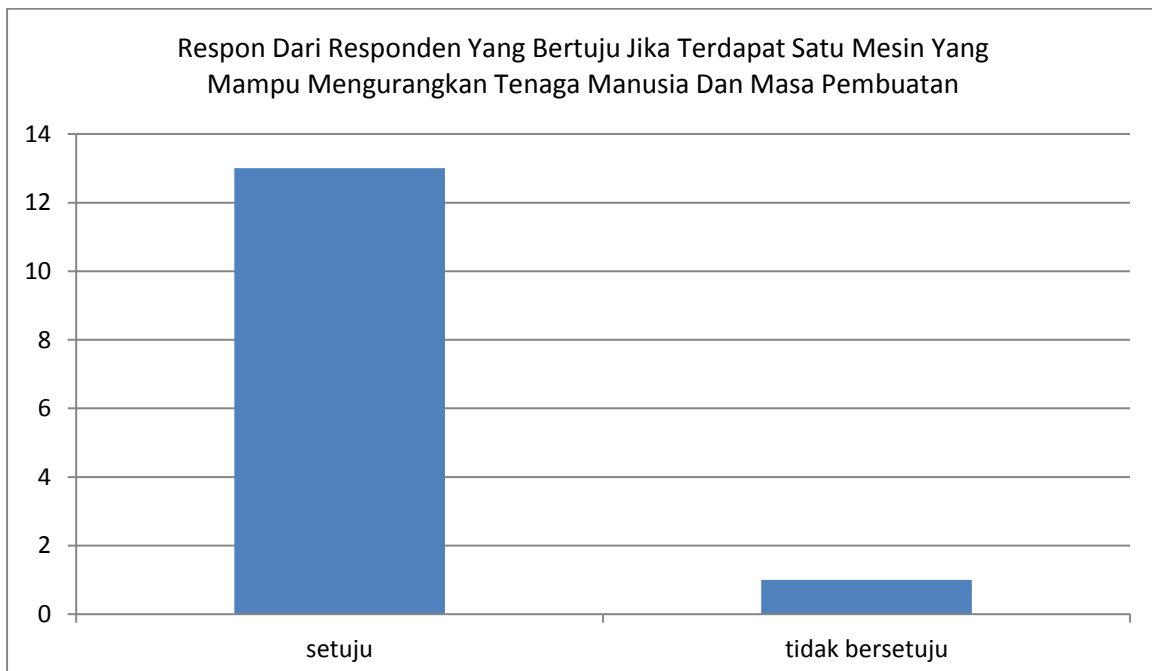
The graph shown that there are four of our respondent stated that they produce less than 50 bowl per day and also four of them stated that they produce more than 100 bowl per day . Majority choose more than 200 bowl per day

Q4: adakah anda bersetuju sekiranya anda disediakan dengan mesin pembuatan cendol secara automatik?



The graph shown that there are 13 people of our respondent really agree if there is one automatic machine that can produce cendol in the market and only one of them didn't agree because of afraid of the cost

Q5: Adakah anda bersetuju jika terdapat satu mesin pembuatan cendol secara automatik yang mampu mengurangkan tenaga manusia dan menjimatkan masa?



The graph shown that there are 13 people of our respondent really agree if there is one automatic machine that can produce cendol in the market that reduce human power and time and only one of them didn't agree.

3.3 Flowchart

Planning flow chart is an important elements in developed Automatic Cendol Dispenser Machine. It may be included of sequence of actions, materials or services entering or leaving the process (inputs and outputs), decisions that must be made, people who become involved, time involved at each step and/or process measurements.

The process described can be a manufacturing process, an administrative or service process and a project plan. This is a generic tool that can be adapted for a wide variety of purposes. This flowchart consist of the flow for overall of Blindness Shoes

3.3.1 Overall Flowchart

The overall flowcharts state the flow of making the Automatic Cendol Dispenser Machine. The flowchart consists of from the starting ideas to choose the main project until the finishing of Automatic Cendol Dispenser Machine. Several test had been done from assembling the components until finishing the project. The main purpose is to test the components or to avoid short circuit when running the Automatic Cendol Dispenser Machine. The Automatic Cendol Dispenser Machine had been tested. While tested there is some unwanted problem occur. The problem needs to overcome by troubleshooting and fix the problem.

The flowchart can be adapted when configure the machine as Automatic Cendol Dispenser Machine using the mega arduino that need to be configure. The process described can be a manufacturing process, an administrative or service process and a project plan. This is a generic tool that can be adapted for a wide variety of purposes. This flowchart consist of the flow for overall of Automatic Cendol Dispenser Machine.

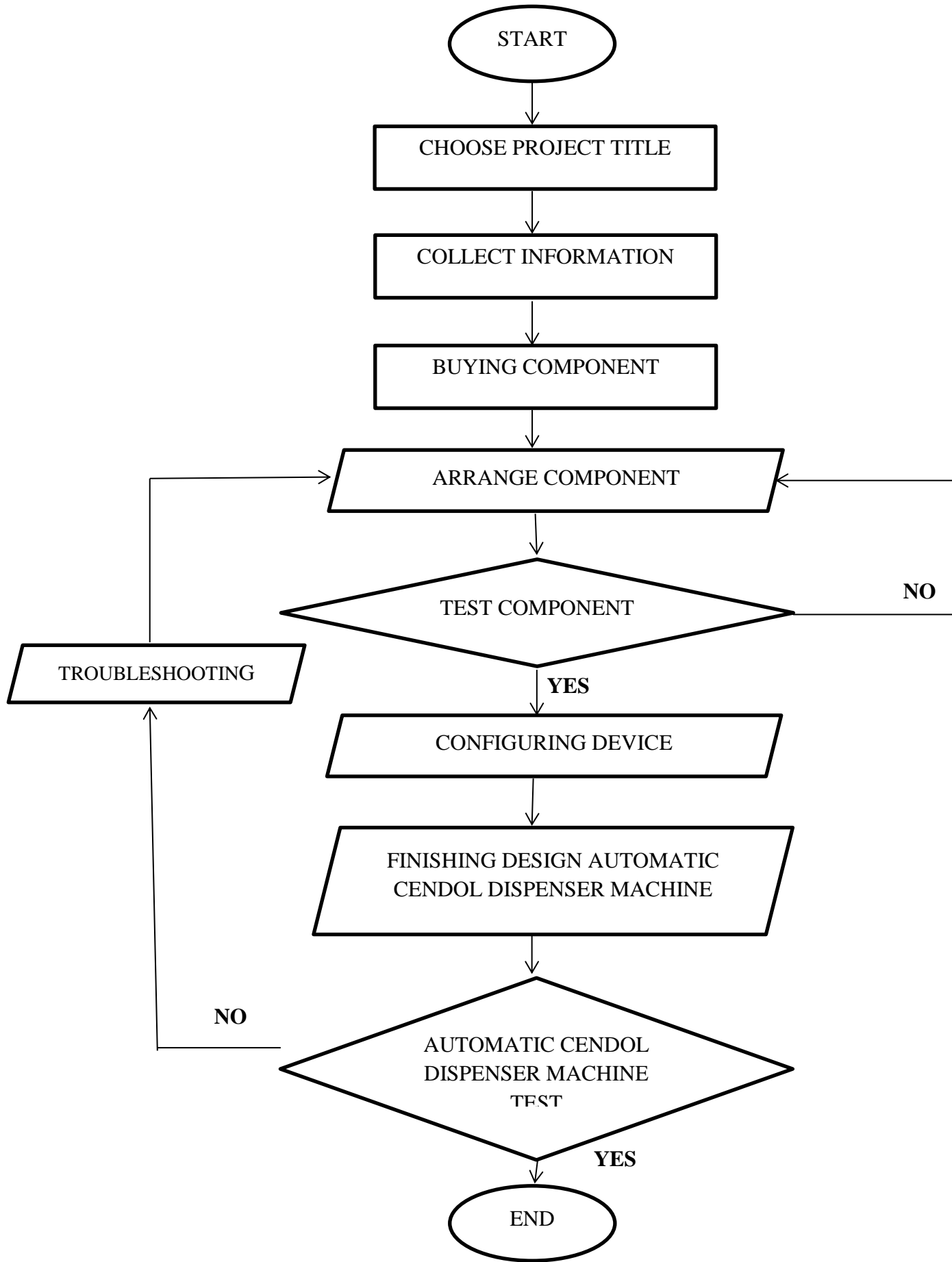


Figure 3.3.1.1: Overall Flowchart

Figure 3.3.1.1 shows the overall flowchart of Automatic Cendol Dispenser Machine project. First step is choosing a project title. Then collect information and start buying a component. After arrange the component. Test the functionality of the component. If the component is failed when test it, buy or test another component. If all the component are functionality, go to next step which is configuring device and finishing design the Automatic Cendol Dispenser Machine. After finishing, do again test for Automatic Cendol Dispenser Machine. If there are no failed no need to do troubleshooting. If there are failed, the Automatic Cendol Dispenser Machine need to do some troubleshooting.

3.3.2 Circuit Flowchart

This flowchart is to determine the flow when making the circuit. There are several steps that need to be done before running the circuit. The circuit mainly needed to run the Automatic Cendol Dispenser Machine. **Figure 3.3.2.1** shows a circuit flowchart. First of all must start with choose a software to make a circuit for Automatic Cendol Dispenser Machine. Then after finish doing a circuit, make a pcb layout. Next do a uv process on pcb and then etching it to trace the route. After finish an etching process, check the connection whether it true or not. If yes, proceed to next step which is drilling and soldering the component. If not must go back to previous step which is etching process. After done drilling and soldering process, go to next step which is configuring circuit and test the circuit. If the circuit failed, do a troubleshooting. If the connection is good, so can start to do the Automatic Cendol Dispenser Machine.

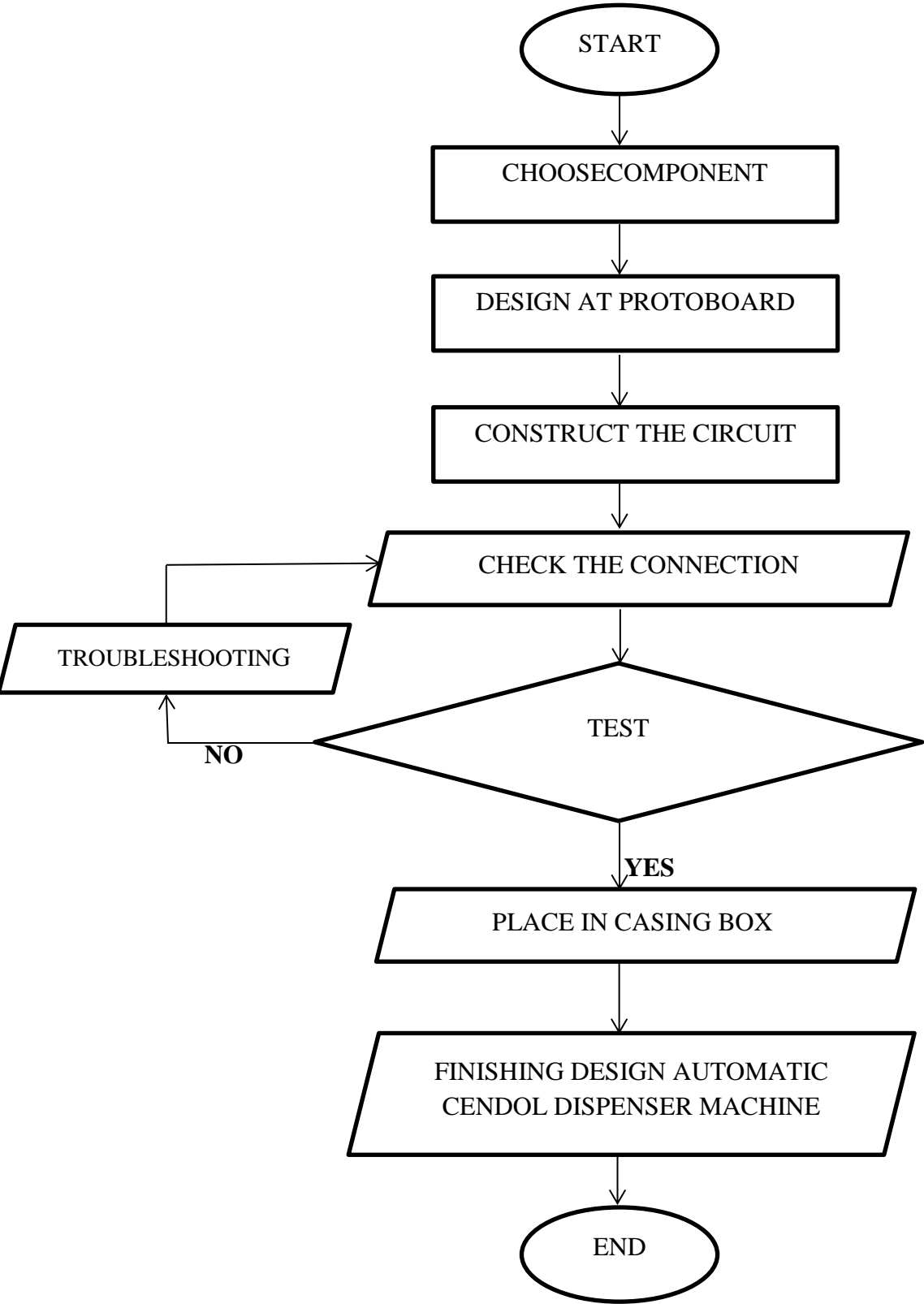


Figure 3.3.2.1: Circuit Flowchart

3.4 Block Diagram

A block diagram is a diagram of a system for Automatic Cendol Dispenser Machine in which the principal parts or functions are represented by blocks connected by lines. It shows the relationships of each block. They are heavily used in engineering in hardware design, electronic design, software design, and process.

Block diagrams are used for higher level, less detailed descriptions that are intended to clarify overall concepts without concern for the details of implementation. Contrast this with the schematic diagrams and layout diagrams used in electrical engineering, which show the implementation details of Blindness Shoes components and Blindness Shoes physical construction.

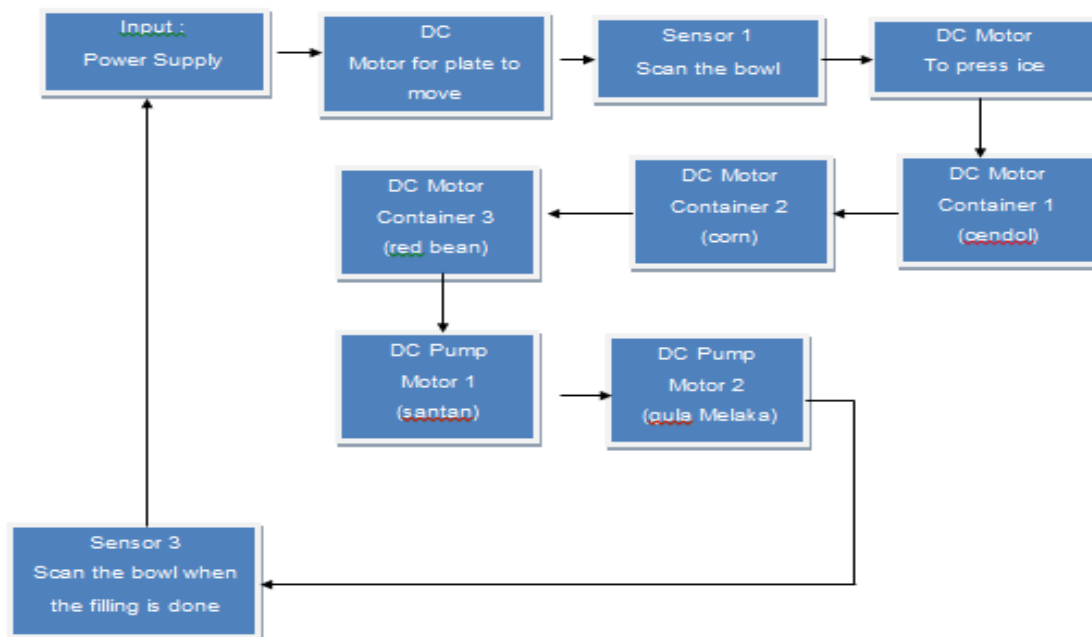


Figure 3.4.1 : Automatic Cendol Dispenser Machine Block Diagram

Figure 3.4.1 shows the Automatic Cendol Dispenser Machine block diagram. From the power supply to the DC motor to move plate and scan with obstacle sensor detect any bowl. Then, the DC motor to press ice was activated as start to grinding ice . A sequence of ingredient is followed after ice was in the bowl start form cendol , corn , red bean , santan and also gula Melaka . when all process is done obstacle detect tge bowl again and cendol is ready to serve .Data will transfer to the Mega Arduino and then transfer to the and the timer was coded.

3.5 Circuit Diagram

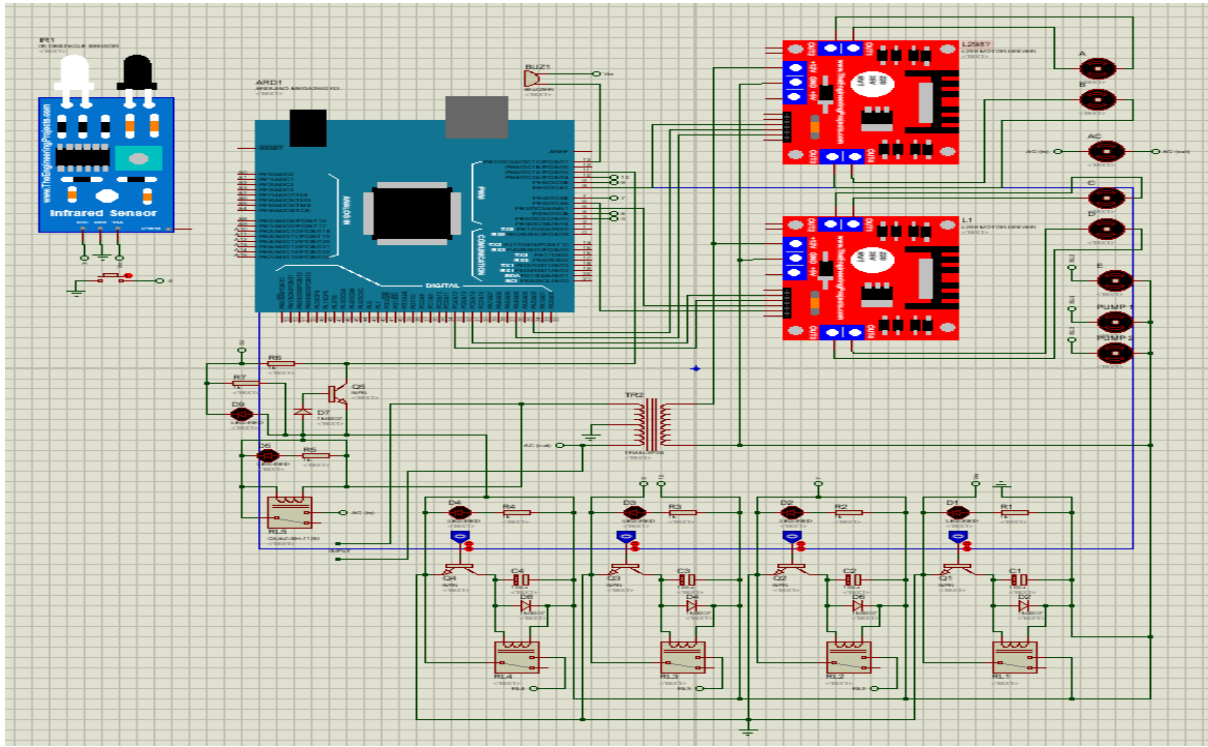


Figure 3.5.1: The circuit diagram of our machine

3.6 Schemetic Layout

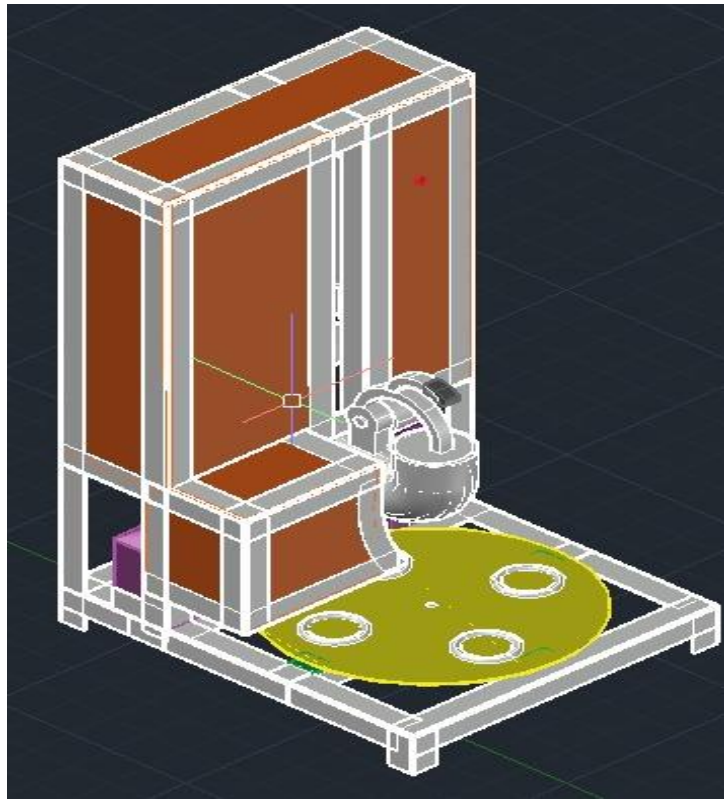


Figure 3.6.1: From the overall sketches

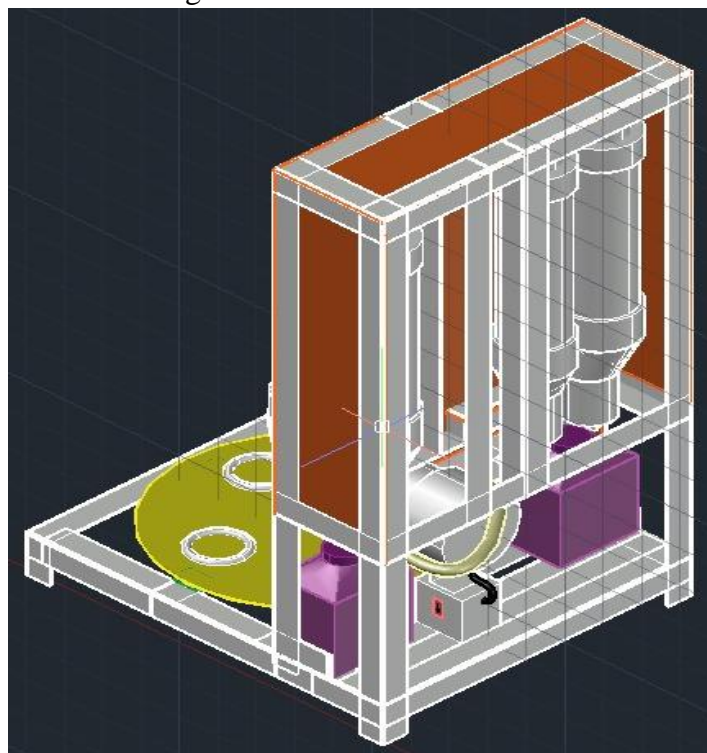


Figure 3.6.2: From the edge view

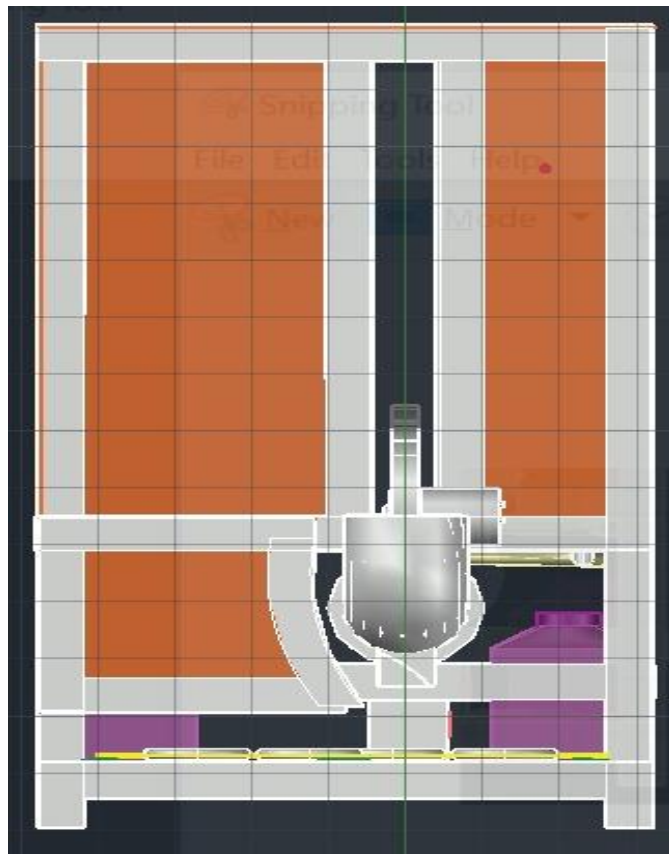


Figure 3.6.3: the front view

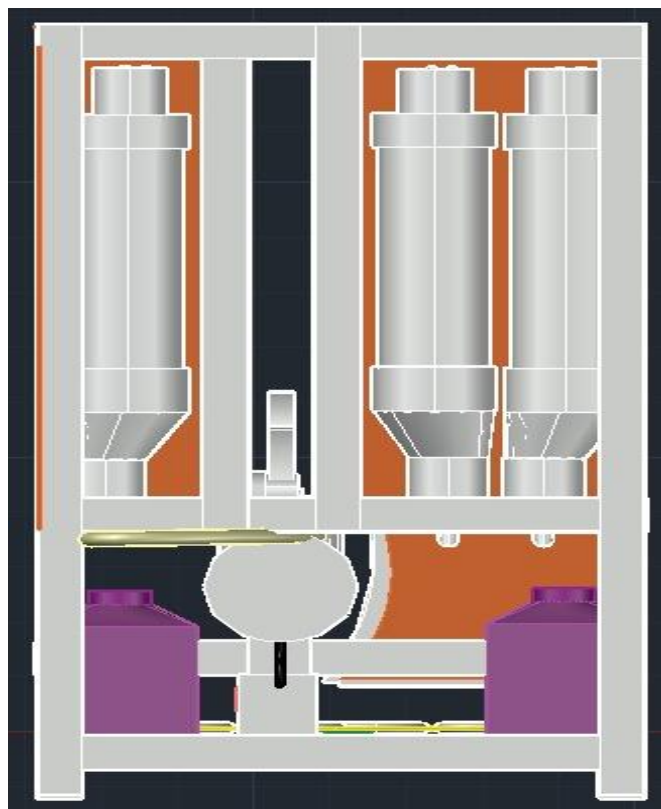


Figure 3.6.4: the back view

3.7 The Collecting Data Component

3.7.1 Mega Arduino

The Arduino Mega is used to control the timer of this machine. This Arduino Mega is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analogue inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila.

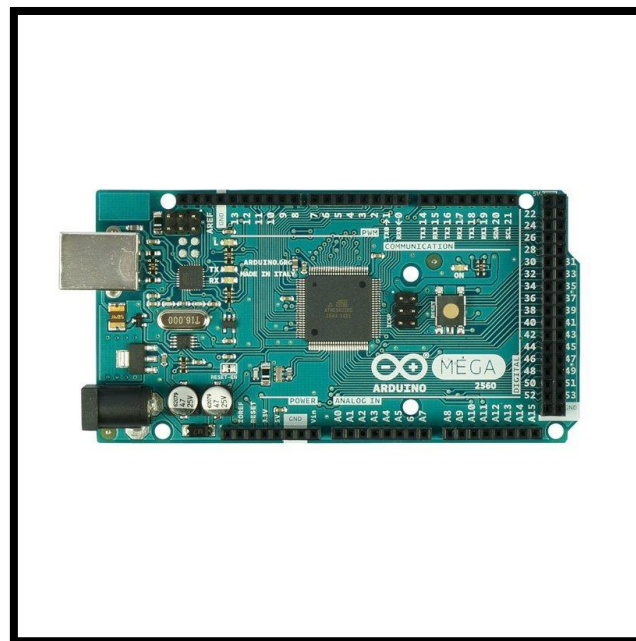


Figure 3.7.1: Mega Arduino

3.7.2 Obstacle Sensor

Obstacle Sensor to detects obstacles and correspondingly changes its direction to avoid collisions. Obstacle detection is applicable to anything that moves, including robot manipulators and manned or unmanned vehicles for land, sea, air, and space; for brevity. These are all called *vehicles* here. Obstacle detection and hazard detection are synonymous terms, but are sometimes applied in different domains.



Figure 3.7.2: Obstacle Sensor

3.7.3 DC Motor

DC Motor to converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor. DC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings.



Figure 3.7.3: DC Motor

3.7.4 DC Pump Motor

DC Pump Motor is a device that moves fluids (liquids or gases), or sometimes slurries, by mechanical action. Pumps can be classified into three major groups according to the method they use to move the fluid: direct lift, displacement, and gravity pumps. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power, come in many sizes, from microscopic for use in medical applications to large industrial pumps.



Figure 3.7.4: DC Pump Motor

3.7.4 Relay

relay because relay can switch that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. As relay diagrams show, when a relay contact is normally open (NO), there is an open contact when the relay is not energized. When a relay contact is Normally Closed (NC), there is a closed contact when the relay is not energized. In either case, applying electrical current to the contacts will change their state.

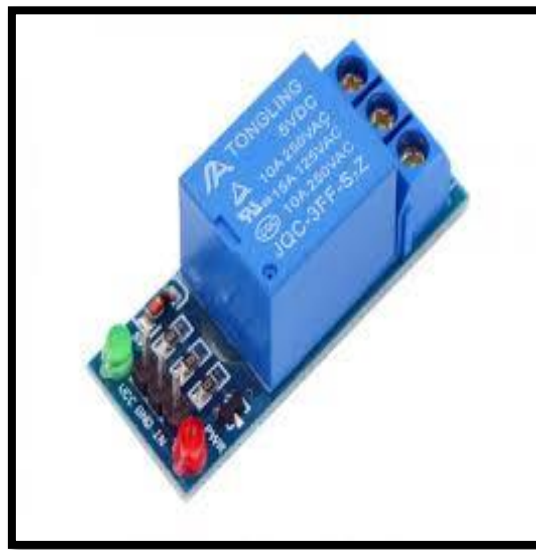


Figure 3.7.5: Relay

CHAPTER 4

ANALYSIS & RESULT

4.1 Analysis of Project

After we done the process of designed and programmed the Automatic Cendol Dispenser Machine, this product was test functionally and successfully. First, we test all the function of component that we use. We also checked the process of filling the ingredient and process of grinding ice by using the real ingredients which is corn , bean , gula Melaka , cendol and also santan. The process are really smooth. The timer of the machine was checked to avoid delay. This Automatic Cendol Dispenser Machine was functioning well.

Furthermore, we also had chance to show and demo our machine to cendol seller in our area to get some advice and comment. There are many of them interested to our machine and want to buy to pursue their business. We also make an analysis toward Automatic Cendol Dispenser Machine by comparing the time taken between manual methods and our machine.

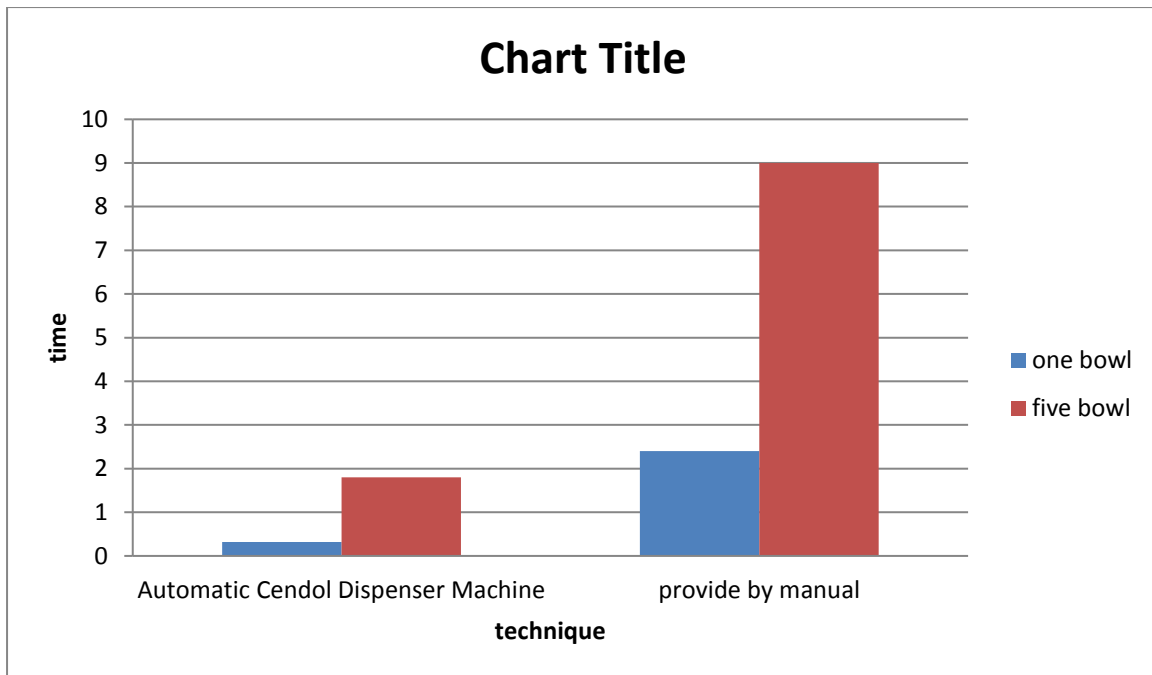


Figure5.1.1:Comparing manual method with our machine

Due to the analysis it shown that automatic cendol dispenser machine is took less than one minutes to produce one bowl of cendol and less than two minutes for five bowl . Furthermore, for manual is taken more than two minutes for one bowl and nine minutes for five bowl. From the result shown that automatic cendol dispenser machine is more faster to produce cendol compare by manual. It is because human power is enable to be in the same level with our product. Our product is more consistent to produce cendol , more faster and didn't need a lot of energy.

4.1.1 Layout Specification



Figure 5.1.1: In left view of Automatic Cendol Dispenser Machine



Figure 5.1.2: In front view of Automatic Cendol Dispenser Machine



Figure 5.1.3: In right view of Automatic Cendol Dispenser Machine

4.3 Survey Result and Analysis



NAMA : MUHAMMAD KAMARUDDIN BIN ISHAK

UMUR : 31 TAHUN

STATUS : SUDAH BERKAHWIN

PEKERJAAN : PENJUAL CENDOL

RESPOND : PRODUK INI MAMPU MEMBANTU
DAN MEMUDAHKAN PENJUAL CENDOL

SOAL SELIDIK SEMI – AUTOMATIC CENDOL MAKER MACHINE

Kami adalah pelajar Politeknik Sultan Salahuddin Abdul Aziz Shah . Tujuan soal selidik ini adalah untuk mengumpul maklumat yang berkaitan dengan projek tahun akhir kami iaitu Semi-Automatic Cendol Maker Machine. Projek ini bertujuan untuk membantu mengurangkan tenaga manusia untuk meletakkan bahan-bahan cendol seperti kacang merah , jagung dan lain-lain ke dalam semangkuk cendol . Selain itu , projek ini juga direka bentuk supaya dapat menjimatkan masa perbuatan cendol . kami akan gembira jika tuan / puan meluangkan masa untuk menjawab soal selidik kami. Sila baca semua dengan teliti , Jawapan anda amatlah berharga bagi kami . Terima kasih.

RESPONDEN DEMOGRAFI

JANTINA : LELAKI/PEREMPUAN

UMUR :

1. Berapa lama anda telah berkerja sebagai penjual cendol ?

kurang dari 5 tahun lebih dari 5 tahun

2. Adakah anda bersetuju ‘Automatic Cendol Dispenser Machine’ mampu berfungsi dengan baik untuk menghasilkan semangkuk cendol?

ya tidak

3. Adakah anda bersetuju ‘Automatic Cendol Dispenser Machine’ mampu menolong penjual cendol untuk meningkatkan keluaran mereka di negara kita?

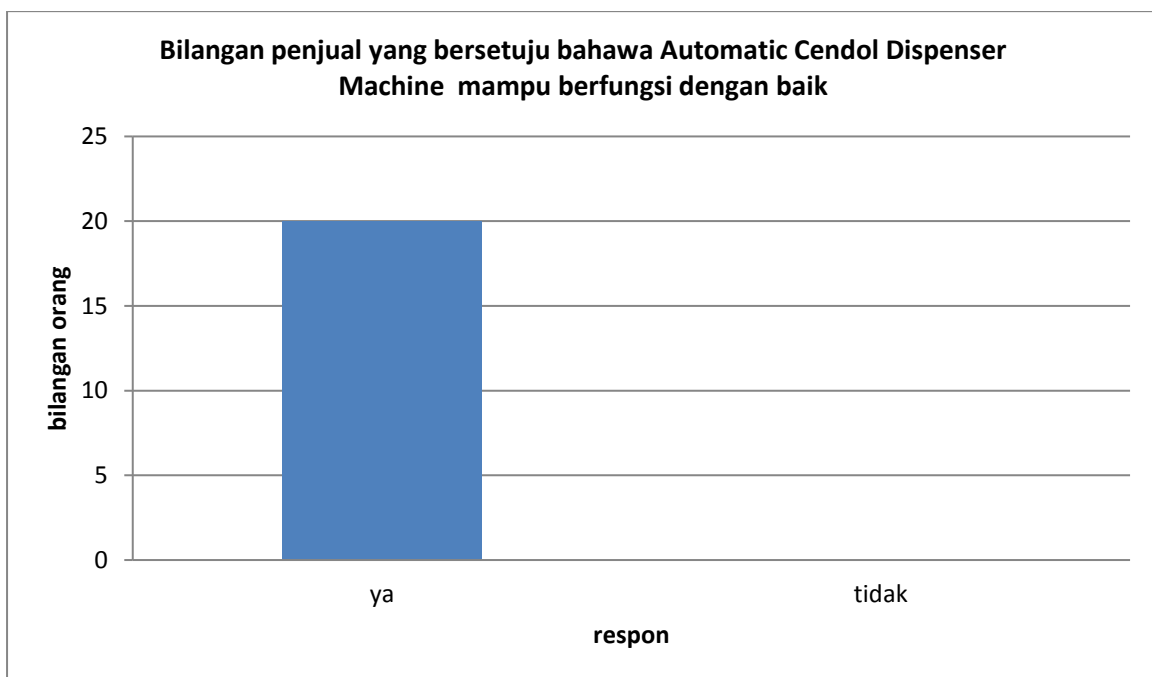
Tiada Ada

Nyatakan cadangan and

RESULT

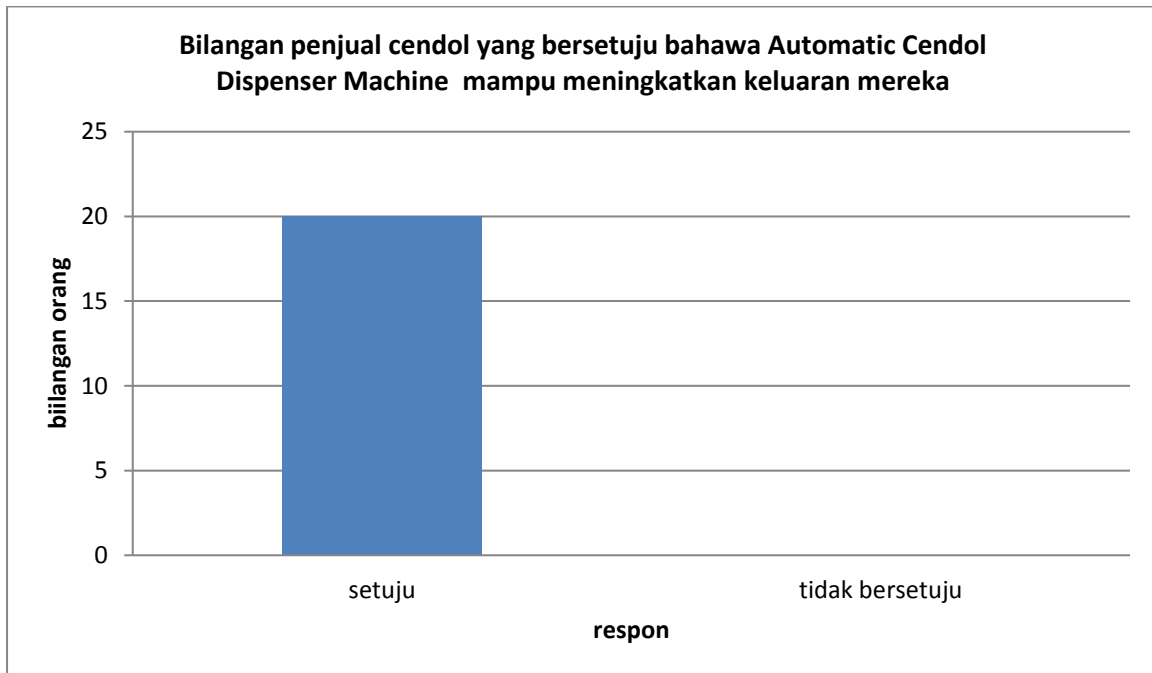
This project which is Automatic Cendol Dispenser Machine was successfully work when it gets started. Based on our survey there are most of our respondent agree that our machine can help the cendol seller in this country to increase their cendol production. Among other aspects it is also can help seller they do not need to hire people to expand their business with it there this machine. They agree with our machine because they didn't need to fill the ingredients by manual.

Q1: Adakah anda bersetuju 'Automatic Cendol Dispenser Machine' mampu berfungsi dengan baik untuk menghasilkan semangkuk cendol?



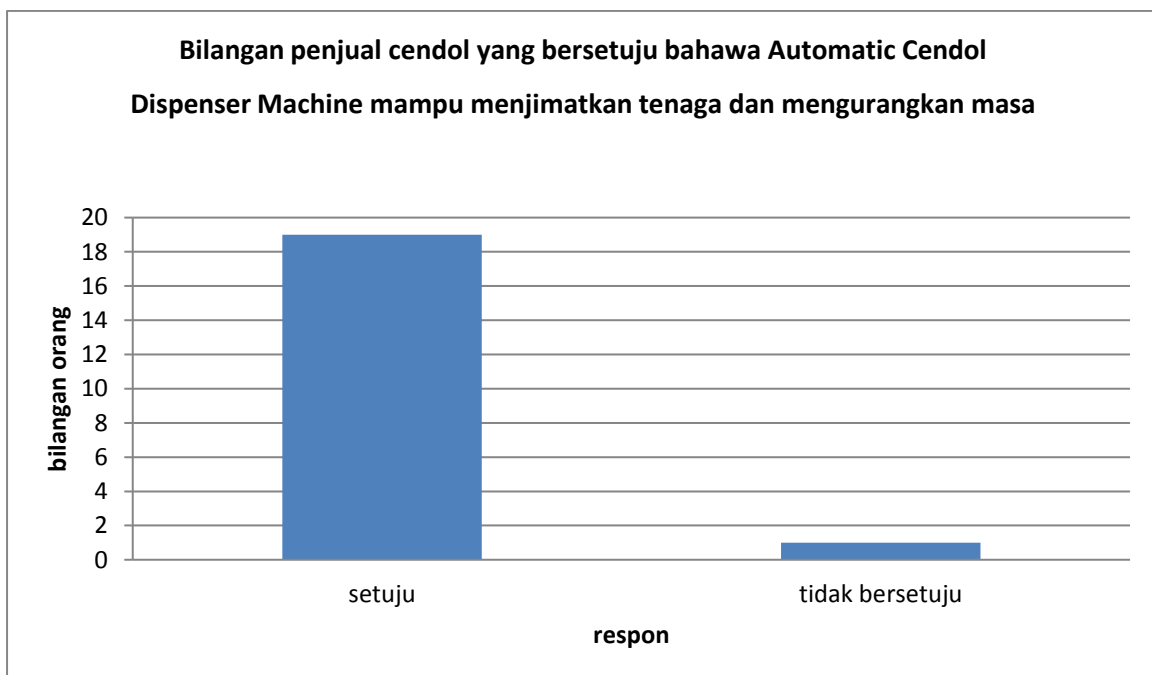
The graph shows that 20 person of our respondent agree that Automatic Cendol Dispenser Machine can work and run successfully

Q2: Adakah anda bersetuju ‘Automatic Cendol Dispenser Machine’ mampu menolong penjual cendol untuk meningkatkan keluaran mereka di negara kita?



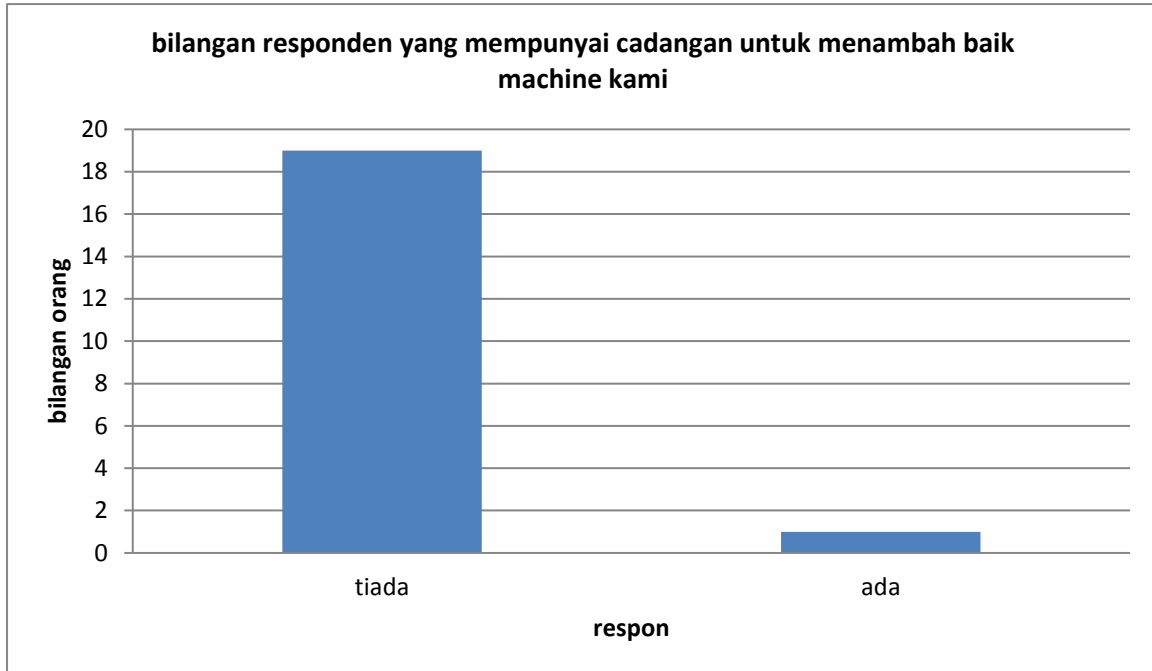
The graph shows that also 20 person of our respondent agree that Automatic Cendol Dispenser Machine can help cendol seller to increase their production in our country Malaysia

Q3: Adakah anda bersetuju ‘Automatic Cendol Dispenser Machine’ mampu menjimatkan masa dan mengurangkan tenaga



The graph shows that only 19 person of our respondent agree that can increase the human and also save time and only one of them didn't not agree.

Q4: Apakah anda mempunyai cadangan untuk menambah baik 'Automatic Cendol Dispenser Machine'?



The graph shows that 19 person of our respondent doesn't have any comment about Automatic Cendol Dispenser Machine because they are totally interested with the machine but only one of them stated their opinion to improve our machine.

Cadangan dari seorang penjual cendol in TTDI Jaya , Shah Alam:

Bagi menyempurnakan mesin ini adalah perlu anda menukar motor DC pada mesin pengisar ais batu bagi melancarkan proses mengisar .

CHAPTER 5

DISCUSSION , CONCLUSION AND RECOMMENDATIONS

5.1 Discussion and Conclusion

During the process to develop the Semi-auto Cendol Maker we faced a lot of problems. The problem that we faced was we unable to find the right and suitable place to put the container of ingredients it is because the filling process need the right place to put the container so that they do not disturb the process. We already do some research and also please of advice to people around us such a lecturer and our parent. After that we finally relies that we need to create a frame to put the container on the machine and two of them beside the machine which the liquid one. In addition, we also have a problem to set up the machine which is to set how many second that we want. We do some research about it and we add the sensor to make the process smooth. From the process also, we learnt a lot of thing. We learn so many knowledges out of our scope that do not have in the text book. We also learnt how to solve the problem with research, please of advice to people who know detail about it, find the book in the library and more. Lastly, this Semi-auto Cendol Maker is really suitable to the cendol seller because it can reduce the human power, the process of filling ingredient can be fast by using this machine. This machine used a lot of latest technology and this machine will not be marketable because this is a new renovation from us. But we still can enhance the project buy use the automatic grinding machine and used the better material to develop the container.

5.2 Recommendation

There are a lot of suggestion to improve Automatic Cendol Dispenser Machine. this product can be improved by changing the size of container so that the cendol seller didn't need to refill every single time. Other than that, change the container with the food grade standard. Redesigned the machine to portable machine easy to carry. Add some controller to remind us if the ingredient was out of use.

REFERENCE

- [1]https://wiki.eprolabs.com/index.php?title=Arduino_Mega_2560
- [2]<https://www.google.com/search?q=infrared+sensor&oq=infrared+&aqs=chrome.1.69i57j0l5.5830j0j4&sourceid=chrome&ie=UTF-8>
- [3]https://en.wikipedia.org/wiki/Stepper_motor
- [4]<https://www.marlinwire.com/blog/food-grade-stainless-steel-facts>
- [5]<https://www.thestar.com.my/news/nation/2019/07/13/angry-customer-makes-cendol-seller-even-richer>
- [6]<https://www.nst.com.my/news/nation/2018/12/437190/dont-mess-our-cendol-netizens-fuming-over-claims-popular-dessert>
- [7]<https://www.electronicshub.org/ir-sensor/>
- [8] <https://ifood.tv/asian/cendol/about>
- [9] https://www.tripadvisor.com.my/ShowUserReviews-g298296-d1175541-r346413993-Mustafa_Cendol-Kuantan_Kuantan_District_Pahang.html
- [10] Dash, Madhab Chandra; Dash, Satya Prakash (2013). Fundamentals Of Ecology 3E. Tata McGraw-Hill Education. p. 213. ISBN 978-1-259-08109-5.

APPENDICES

APPENDIX 1– QUESTIONEIR 1



BORANG SOAL SELIDIK 1

PROJECT 2 (DEE50102)

SEMESTER 5 2019

SOAL SELIDIK SEMI – AUTOMATIC CENDOL MAKER MACHINE

Kami adalah pelajar Politeknik Sultan Salahuddin Abdul Aziz Shah . Tujuan soal selidik ini adalah untuk mengumpul maklumat yang berkaitan dengan projek tahun akhir kami iaitu Semi-Automatic Cendol Maker Machine. Projek ini bertujuan untuk membantu mengurangkan tenaga manusia untuk meletakkan bahan-bahan cendol seperti kacang merah , jagung dan lain-lain ke dalam semangkuk cendol . Selain itu , projek ini juga direka bentuk supaya dapat menjimatkan masa perbuatan cendol . kami akan gembira jika tuan / puan meluangkan masa untuk menjawab soal selidik kami. Sila baca semua dengan teliti , Jawapan anda amatlah berharga bagi kami . Terima kasih.

RESPONDEN DEMOGRAFI

JANTINA : LELAKI/PEREMPUAN

UMUR :

1. Berapa lama anda telah berkerja sebagai penjual cendol ?

kurang dari 5 tahun lebih dari 5 tahun

2. Adakah tuan/puan menghadapi kesukaran dalam proses penyediaan cendol ?

ya tidak

3. Berapa lama anda mengambil masa untuk menyediakan semangkuk cendol ?

2-4 minit

5- 10 minit

11- 15 minit

4. Berapakah anggaran keluaran cendol dalam sehari ?

5. Adakah anda bersetuju sekiranya anda disediakan dengan mesin pembuatan cendol secara automatik ?

Ya

tidak

6. Adakah anda bersetuju jika terdapat satu mesin pembuatan cendol secara automatik yang mampu mengurangkan tenaga manusia dan menjimatkan tenaga ?

Ya

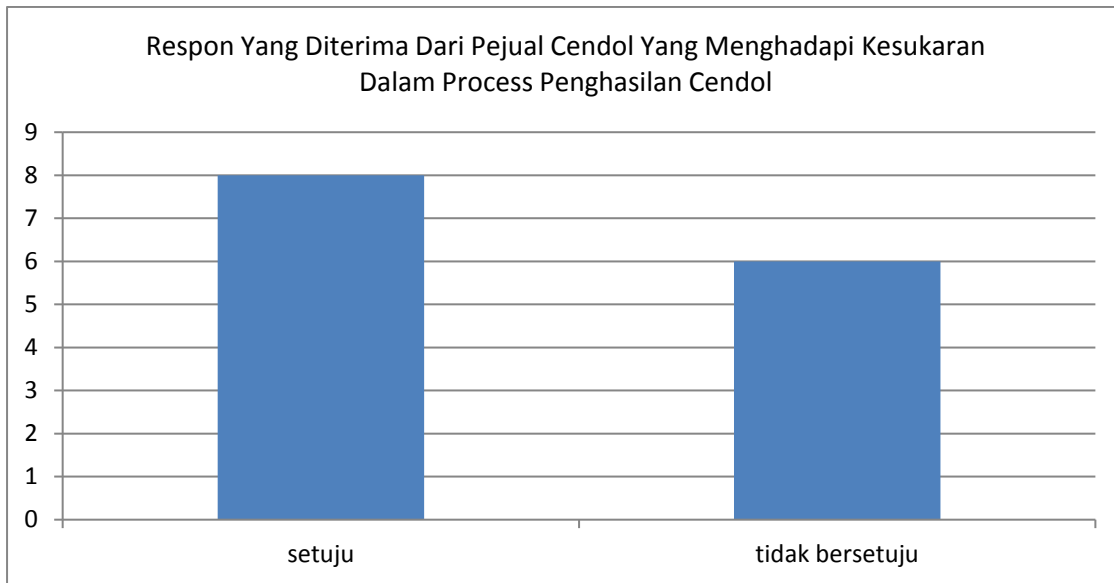
tidak

7. Adakah anda bersetuju jika mesin yang dibentuk bersifat mudah alih ?

Ya

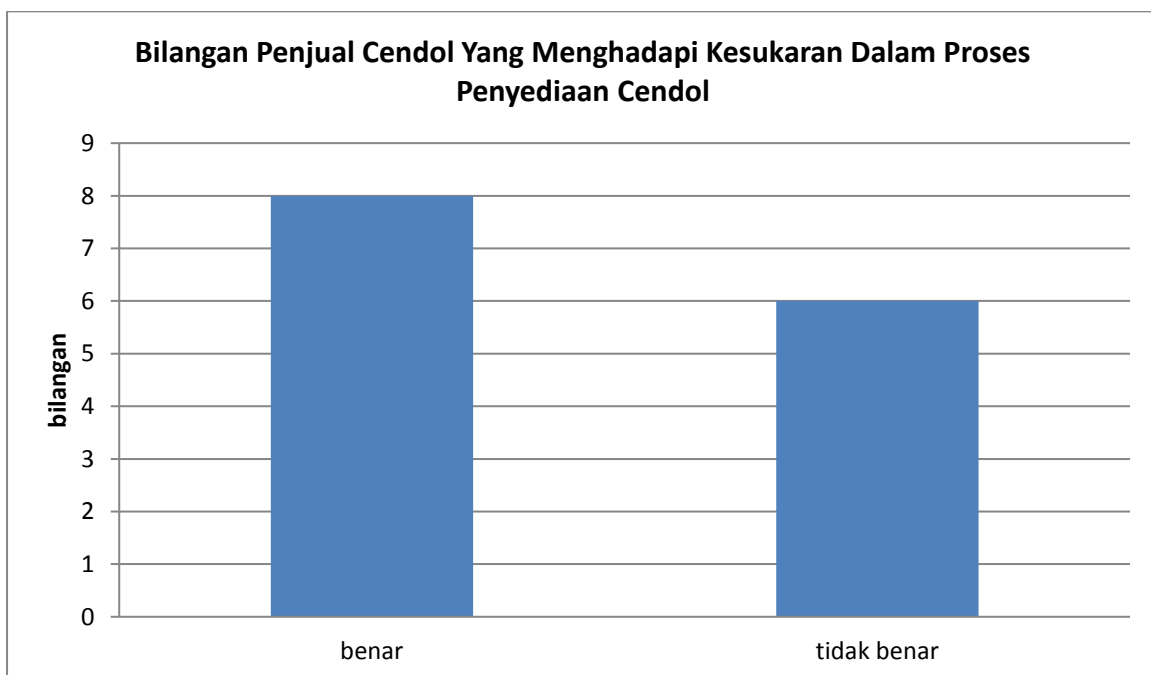
tidak

Q1: Berapa lama anda telah bekerja sebagai pejual atau pengusaha cendol?



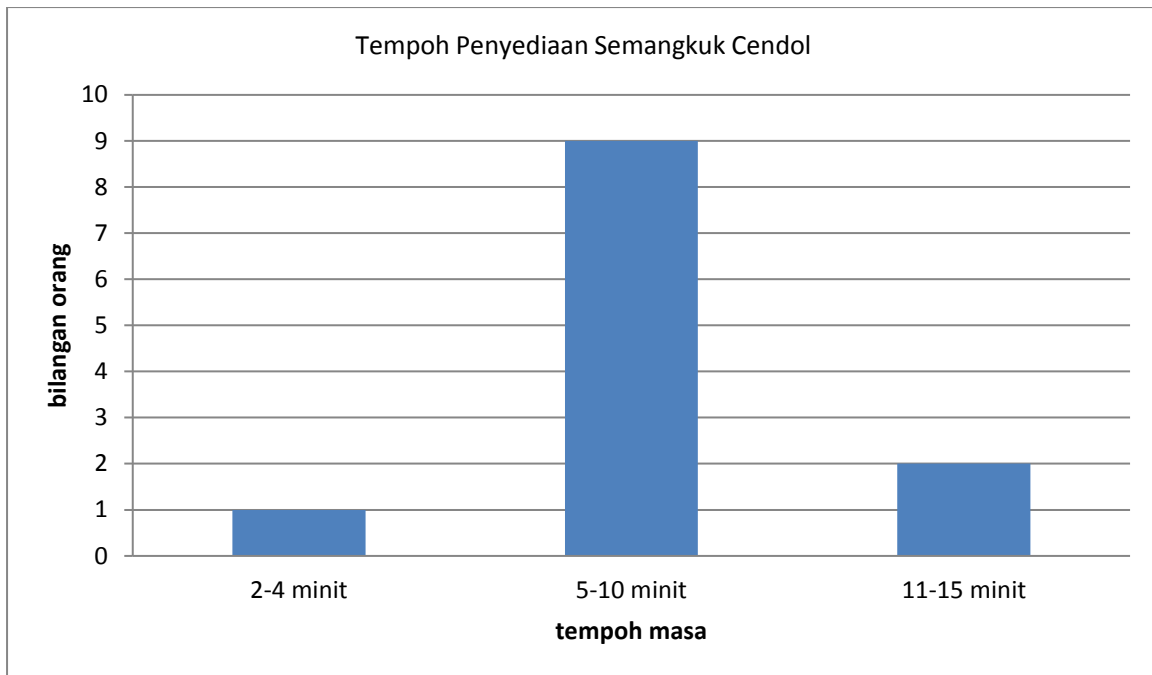
The bar graph shown that there are eight of our respondent who have stated that they faced a difficulty by preparing one bowl of cendol and another six of them didn't faced any difficulty to prepare a cendol.

Q2: Adakah tuan/puan menghadapi kesukaran dalam proses penyediaan cendol?



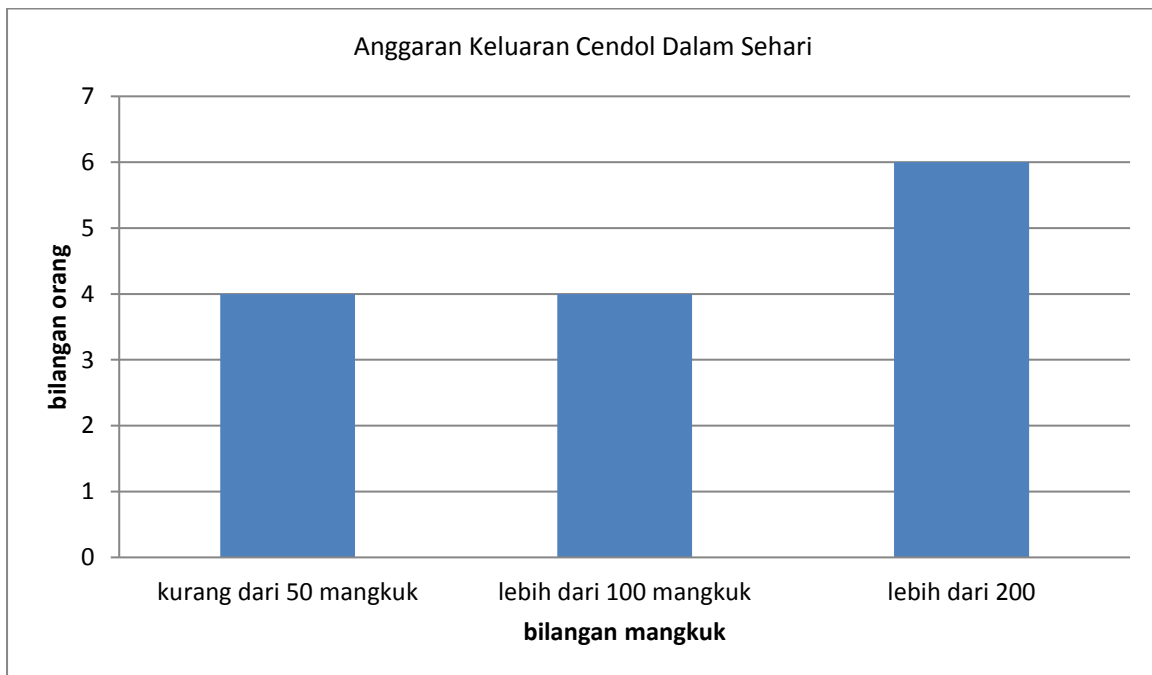
From the graph there are eight of our respondent who have stated that they have a difficulty by preparing one bowl of cendol and another 6 did not have any difficulty by preparing a cendol.

Q3: berapa lama anda mengambil masa untuk menyediakan semangkuk cendol?



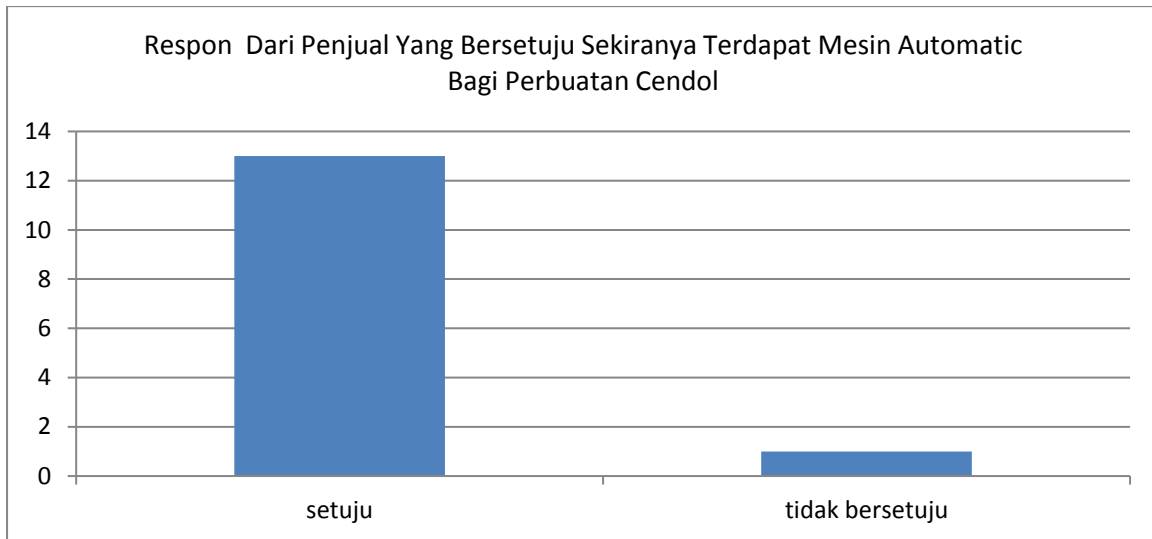
The bar graph shown there are only one of our respondent took only 2-4 minutes to prepare one bowl of cendol and 2 people took very long time which is 11-15 minutes . Futhermore, there are majority of them which is 9 people took 5-10 minutes.

Q3: berapa anggaran keluaran cendol dalam sehari?



The graph shown that there are four of our respondent stated that they produce less than 50 bowl per day and also four of them stated that they produce more than 100 bowl per day . Majority choose more than 200 bowl per day

Q4: adakah anda bersetuju sekiranya anda disediakan dengan mesin pembuatan cendol secara automatik?



The graph shown that there are 13 people of our respondent really agree if there is one automatic machine that can produce cendol in the market and only one of them didn't agree because of afraid of the cost

Q5: Adakah anda bersetuju jika terdapat satu mesin pembuatan cendol secara automatik yang mampu mengurangkan tenaga manusia dan menjimatkan masa?



The graph shown that there are 13 people of our respondent really agree if there is one automatic machine that can produce cendol in the market that reduce human power and time and only one of them didn't agree.

APPENDIX 2 – SOP



Standard Operating Procedure Of Automatic Cendol Dispenser Machine

STEP 1 : put the ingredient in the five container after that insert the container in the machine



STEP 2: insert an ice in the grinding machine



STEP 3: put the bowl on the bowl holder



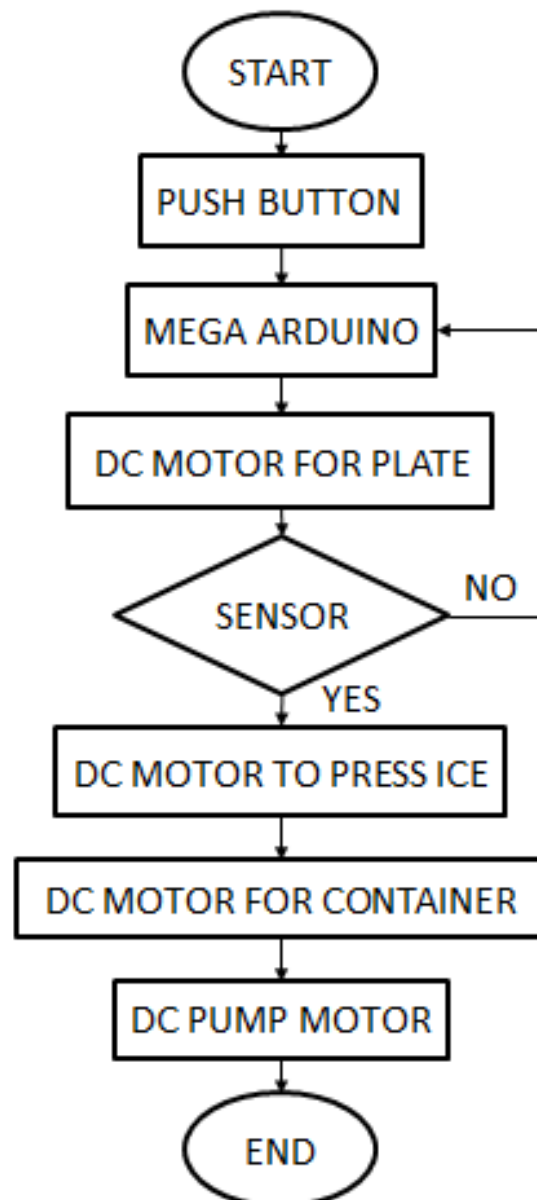
STEP 4: push the start button



STEP 5: push the grinding machine to press ice

STEP 6: cendol is ready to serve

FLOWCHART



APPENDIX 3 – POSTER

 <p>VENTION & INNOVATION TECHNOLOGY EXPOSITION</p>	<p>Tajuk Projek (Title of the project)</p> <h2 style="text-align: center;">Automatic Cendol Dispenser Machine</h2>		 <p>SULTAN SALAHUDDIN ABDUL AZIZ SHAH</p>
<p>Orkesia Penyelidik / Pencipta Main Researcher / Inventor</p> <p><u>Nur Izzah Izzati Binti Norli</u></p>	<p>Nama Kumpulan Penyelidik / Pencipta Bersama (Researchers/Inventors Groups)</p> <p><u>Nur Izzah Izzati Binti Norli</u> <u>Abdul Muhaimin Bin Mukhtar</u> <u>Muhammad Akramin Bin Zakaria</u></p>		<p>E-Mel (E-mail)</p> <p>nurizzahizzatis174@gmail.com abdulmuhaiminmukhtar@gmail.com mr.akramin@gmail.com</p>
<p>Infografi Graphical Information)</p> 	<p>Deskripsi Produk Abstrak (Product Description/Abstract)</p> <p>Cendol is the one of the famous traditional food in Malaysia. During a hot day, cendol get the highly demand from the customer. The traditional method is use by the villages to produce cendol. And this traditional method unable to fill many requests from customer in the same time. Therefore, this project was proposed to develop the Automatic Cendol Dispenser Machine that will prepared cendol automatically control by the controlling system. This machine will develop by using Mega Arduino to control the timer of motor and sensor. In this project the obstacle sensor and DC pump motor has been used in the filling process. The specific container contained with section. All the ingredient automatically dropped as it controlled by the timer. This project which is Automatic Cendol Dispenser Machine also will be able to help the cendol seller in this country to increase their cendol production at the same time will be reduce the human power. Among other aspects it is also can help seller they do not need to hire people to expand their business with this machine.</p>		
<p>Pernyataan Masalah (Problem Statement)</p> <ol style="list-style-type: none"> 1) From our observations, among the problems that often faced by some cendol entrepreneurs is when the process of filling ingredients. 2) It is because the filling process that they use is a manual process. 3) Manual process become worst when they were facing a lot of customer in one period of time 	<p>Objektif (Objectives)</p> <ol style="list-style-type: none"> 1) To develop the Semi-auto Cendol Maker. 2) To create a controller system using sensor and Mega Arduino. 3) To analyze the performant machine. 	<p>Metodologi (Methodology)</p>  <pre> graph TD START([START]) --> PUSH_BUTTON[PUSH BUTTON] PUSH_BUTTON --> MEGA_ARDUINO[MEGA ARDUINO] MEGA_ARDUINO --> DC_MOTOR_PLATE[DC MOTOR FOR PLATE] DC_MOTOR_PLATE --> SENSOR{SENSOR} SENSOR -- NO --> MEGA_ARDUINO SENSOR -- YES --> DC_MOTOR_PRESS_ICE[DC MOTOR TO PRESS ICE] DC_MOTOR_PRESS_ICE --> DC_MOTOR_CONTAINER[DC MOTOR TO CONTAINER] DC_MOTOR_CONTAINER --> DC_PUMP_MOTOR[DC PUMP MOTOR] DC_PUMP_MOTOR --> END([END]) </pre>	
<p>Potensi Market (Market Potentials)</p> <ol style="list-style-type: none"> 1) For entrepreneur that produce cendol 2) For people who want to serve their guest with cendol 	<p>Harta Intelekt (IP) (Intellectual Property)</p> <p>Industrial Design :</p> <p>Copyright :</p>	<p>Kolaborasi Industri / Institusi (Industrial / Institution Collaboration)</p> <p><i>Politeknik Sultan Salahuddin Abdul Aziz Shah</i></p>	
<p>Hubungi : Penyelidik (Nama dan No. telefon) (Contact : Supervisor / Name and Telephone No.)</p> <p><u>Puan Rohanza Binti Mohd Zali</u> (016-2955766) <u>Puan Nurul Akmar Binti Kamaruddin</u> (017-2298799) <u>Puan Aslinda Binti Zamah Shari</u> (012-3352263) <u>Puan Annuafdeatul Binti Mohamed Amin</u> (012-6372049)</p>	<p>Nama Pemilik IP / Alamat (Owner IP Name / Address)</p> <p style="text-align: center;">Pengarah Politeknik Sultan Salahuddin Abdul Aziz Shah 40150 Shah Alam Selangor</p>		

APPENDIX 4– PAMPHLET

BLOCK DIGRAM

```

graph TD
    MS[Motor Power Supply] --> DM11[DC Motor for plate 11]
    DM11 --> S1[Sensor 1]
    S1 --> DM12[DC Motor for plate 12]
    DM12 --> DM13[DC Motor for plate 13]
    DM11 --> DM12
    DM12 --> DM13
    DM11 --> DM12
    DM12 --> DM13
    DM11 --> DM12
    DM12 --> DM13
    
```

ANALYSIS

Technique	# use load	# fix load
Automatic Cendol Dispenser Machine	~1.5	~2.5
provide by manual	~2.5	~9.5

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POLITEKNIK
SULTAN SALAHUDDIN
ABDUL AZIZ SHAH

JABATAN KEJURUTERAAN ELEKTRIK

Automatic Cendol Dispenser Machine

PROJECT PICTURE



FIGURE 1: Cendol Dispenser Machine

OBJECTIVE

- TO DEVELOP THE AUTOMATIC CENDOL DISPENSER MACHINE
- TO CREATE A CONTROLLER SYSTEM USING SENSOR AND MEGA ARDUINO
- TO ANALYZE THE PERFORMANT MACHINE

About Semi -Auto Cendol Maker Machine

This Automatic Cendol Dispenser Machine is suitable for any cendol seller out there . The part of control system in this machine is containing of Mega Arduino, DC motor, Obstacle Sensor, DC Pump Motor and AC motor. This machine is divided by 3 main elements which is rotating plate, filling section and controlling system. First, the rotating plate has been control by DC Motor. Second element which is filling process has been control by DC pump motor, AC motor and time control by Mega Arduino. Third element is controlling the system has been control by obstacle sensor and Mega Arduino. The dimension of the semi-auto cendol maker machine with length is 46cm, width is 53.5cm and the height is 66cm . This project able reduces time and it is easy to use. The percentage to increase the production is 52%. Furthermore, this product can help the cendol seller to produce a cendol in the small uses of human power with a little time taken needed to full customer request in more efficient way. So the customer will not waiting too long for their cendol.

PROBLEM STATEMENT

- From our observations, among the problems that often faced by some cendol entrepreneurs is when the process of filling ingredients.
- It is because the filling process that they use is a manual process.
- Manual process become worst when they were facing a lot of customer in one period of time



FIGURE 2: The customer need to queue to wait for their turn to buy cendol



APPENDIX 5 – GANTT CHART

WEEK/ ACTIVITY	LW 1	LW 2	LW 3	LW 4	LW 5	LW 6	LW 7	LW 8	LW 9	LW 10	LW 11	LW 12	LW 13	LW 14	LW 15
PROJECT															
BRIEFING															
GROUP															
FORMATION															
SUBMISSION OF															
PROJECT TITLE															
PROPOSED PAPER															
PREPARATION															
PRESENTATION															
PROGRES OF THE PROJECT															
REPORT															
PRESENTATION AND SUBMISSION PROJECT															

SEMESTER 4

WEEK/ ACTIVITY	LW 1	LW 2	LW 3	LW 4	LW 5	LW 6	LW 7	LW 8	LW 9	LW 10	LW 11	LW 12	LW 13	LW 14
DISCUSSION AND GUIDANCE														
BUILD THE MODEL														
TESTING AND TROUBLESHOOTING														
IMPROVING THE PROJECT														
PROJECT PRESENTATION														
SUBMIT LOG BOOK														
SUBMIT FINAL REPORT														

SEMESTER 5

APPENDIX 6– TECHNICAL PAPER

APPENDIX 7 – PICTURE





APPENDIX 8 – PROGRAMMING

```
//-----  
  
#define Swith_on 4  
  
#define Sensor_Start 2  
#define Sensor_Proses 3  
  
#define Motor_A 8 // MOTOR_A UNTUK BAWA BEKAS CENDOL  
  
#define Motor_BF 25  
#define Motor_BR 23 // MOTOR_B TEKAN AIS BATU  
  
#define Motor_AC 11 //Motor_AC UNTUK HIDUPKAN PENGGISAR AIS BATU  
  
#define Motor_CF 27  
#define Motor_CR 29 // Motor_C untuk turunkan cendol  
  
  
#define Motor_DF 6  
#define Motor_DR 5 //Motor_D untuk turunkan kacang  
  
#define Motor_EF 7  
#define Motor_ER 37 //Motor_E untuk turunkan jagung  
  
#define Pump1_santan 9  
#define Pump2_gulamelaka 10  
#define Buzzer 13  
  
int Switch_onState = 0; // variable for reading the pushbutton status  
int Counter=0;  
int proses =0;  
int run =0;  
int stop =0;  
  
void setup(void)  
{  
  Serial.begin(9600);  
  
  pinMode(Sensor_Start, INPUT);  
  pinMode(Sensor_Proses, INPUT);  
  pinMode(Swith_on, INPUT_PULLUP);  
  
  pinMode( Motor_A, OUTPUT); // MOTOR_A UNTUK BAWA BEKAS CENDOL  
  
  pinMode( Motor_BF, OUTPUT);  
  pinMode( Motor_BR, OUTPUT); // MOTOR_B TEKAN AIS BATU  
  
  pinMode( Motor_AC, OUTPUT); //Motor_AC UNTUK HIDUPKAN PENGGISAR AIS BATU  
  
  pinMode( Motor_CF, OUTPUT);  
  pinMode( Motor_CR, OUTPUT); // Motor_C untuk turunkan cendol
```

```

pinMode( Motor_DF,   OUTPUT);
pinMode( Motor_DR,   OUTPUT); //Motor_D untuk turunkan kacang

pinMode( Motor_EF,   OUTPUT);
pinMode( Motor_ER,   OUTPUT); //Motor_E untuk turunkan jagung

pinMode( Pump1_santan,   OUTPUT);
pinMode( Pump2_gulamelaka,   OUTPUT);

pinMode( Buzzer,   OUTPUT);
}

void loop(void)

{
  Switch_onState = digitalRead(Swith_on);
  if ( Switch_onState == LOW and run ==0){

    digitalWrite(Motor_A, HIGH);
    run =1;

  }

  if (digitalRead(Sensor_Proses)== 0 and run==1){
    digitalWrite(Motor_A, LOW);
    Counter = Counter+1;
    delay(500);
    Serial.println(Counter);

    digitalWrite(Motor_BF, HIGH); //motor tekan ais turun
    digitalWrite(Motor_BR, LOW);
    digitalWrite(Motor_AC, LOW);
    delay(2000);
    digitalWrite(Motor_BF, HIGH);
    digitalWrite(Motor_BR, LOW);
    digitalWrite(Motor_AC, LOW);
    delay(500);
    digitalWrite(Motor_BF, HIGH);
    digitalWrite(Motor_BR, LOW);
    digitalWrite(Motor_AC, LOW);
    delay(2000);

    digitalWrite(Motor_AC, HIGH);
    delay(4000);

    digitalWrite(Motor_BF, LOW);
    digitalWrite(Motor_BR, HIGH);
    digitalWrite(Motor_AC, HIGH);
    delay(500);

```

```
digitalWrite(Motor_BF, LOW);
digitalWrite(Motor_BR, HIGH);
digitalWrite(Motor_AC, HIGH);
delay(3000);
digitalWrite(Motor_BF, LOW);
digitalWrite(Motor_BR, LOW); //motor tekan ais naik
digitalWrite(Motor_AC, LOW);
```

```
digitalWrite(Motor_AC, LOW);
delay(2000);
```

```
// Motor_C untuk turunkan cendol
digitalWrite(Motor_CF, HIGH);
digitalWrite(Motor_CR, LOW);
delay(5000);
digitalWrite(Motor_CF, LOW);
digitalWrite(Motor_CR, LOW);
```

```
// JARAK ANTARA SATU PROSES
```

```
// Motor_D untuk turunkan kacang
digitalWrite(Motor_DF, HIGH);
digitalWrite(Motor_DR, LOW);
delay(3000);
digitalWrite(Motor_DF, LOW);
digitalWrite(Motor_DR, LOW);
```

```
// JARAK ANTARA SATU PROSES
```

```
//Motor_E untuk turunkan jagung
digitalWrite(Motor_EF, HIGH);
digitalWrite(Motor_ER, LOW);
delay(3000);
digitalWrite(Motor_EF, LOW);
digitalWrite(Motor_ER, LOW);
```

```
// JARAK ANTARA SATU PROSES
```

```
digitalWrite(Pump1_santan, HIGH);
delay(2500);
digitalWrite(Pump1_santan, LOW);
```

```
// JARAK ANTARA SATU PROSES
```

```
digitalWrite(Pump2_gulamelaka, HIGH);
delay(2500);
digitalWrite(Pump2_gulamelaka, LOW);
```

```
digitalWrite(Motor_A, HIGH);
delay(1500);
digitalWrite(Motor_A, LOW);
```

```
digitalWrite(Buzzer, HIGH);
delay(1000);
digitalWrite(Buzzer, LOW);
delay(500);
digitalWrite(Buzzer, HIGH);
```



```
delay(1000);  
digitalWrite(Buzzer, LOW);  
  
run =0;  
  
}  
}  
  
// program tamat push button semula
```