POLITEKNIK SULTAN SALAHUDDIN ABDUL AZIZ SHAH

FINAL PROPOSAL

Project Tittle	Heat Rashes Temperature Sensor For Baby
Student Name	Jivaashinie A/P Balasundram
Course Code	DEE50102
Supervisor Name	Puan Nor Kharul Aina Bt Mat Din

DECLARATION OF ORIGINALITY AND OWNERSHIP

TITLE : HEAT RASHES TEMPERATURE SENSOR FOR BABY

SESSION : 2 2021/2022

1. JIVAASHINIE A/P BALASUNDRAM (08DEU20F1019) I am a final year student of Diploma in Electronic Engineering (Medical), Department of Electrical Engineering, Politeknik Premier Sultan Salahuddin Abdul Aziz Shah, which is located Persiaran Usahawan, Politeknik Premier Sultan Salahuddin Abdul Aziz Shah, 40150 Shah Alam, Selangor.

2. I acknowledge that 'The Project above' and the intellectual property there in is the result of our original creation / creation without taking or impersonating any intellectual property from the other parties.

3. We agree to release the 'Project' intellectual property to 'The Polytechnics' to meet the requirements for awarding the Diploma in Electronic Engineering (Medical) to me.

Made and in truth that is recognized by;

JIVAASHINIE A/P BALASUNDRAM (.....)

(Identification card No: 020503-01-1536)

In front of me, PUAN NOR KHARUL AINA BINTI MAT DIN (.....)

As a project supervisor, on the date: ……

APPROVAL PAGE FOR FINAL YEAR PROJECT

Submitted in partial full of requirements for diploma of Electronic Medical Engineering at Politeknik Premier Sultan Salahuddin Abdul Aziz Shah by :

Candidate: JIVAASHINIE A/P BALASUNDRAM

Department/Field of Concentration: Electrical Engineering Department

TITLE: HEAT RASHES TEMPERATURE SENSOR FOR BABY

APPROVED:

_____ _____

Supervisor Project Signature

ACKNOWLEDGEMENT

First and foremost, praises and thanks to the God, the Almighty, for His showers of blessings throughout my final year project to complete the project successfully.

I would like to express my deep and sincere gratitude to my project supervisor Pn. Nor Khairul Aina Bt Mat Din, professor of electrical engineering department for giving me the opportunity to do project and providing invaluable guidance throughout this project. Her dynamism, vision, sincerity and motivation have deeply inspired me. She has taught me the methodology to carry out the research and to present the researchworks as clearly as possible. It was a great privilege and honor to work and study under her guidance. I am extremely grateful for what she has offered me.

I am extremely grateful to my parents for their love, prayers, caring and sacrifices for educating and preparing me for my future. Finally, my thanks go to all the people who have supported me to complete the research work directly or indirectly.

ABSRTACT

Researcher: Jivaashinie A/P Balasundram

Presentation Title: Heat Rashes Temperature Sensor For Baby

Research focus: Biomedical Electronic

School: Politeknik Premier Sultan Salahuddin Abdul Aziz Shah

Student Level: Diploma

ABSRTACT:

In this project, I've built a temperature sensor using Arduino and the DTH11 temperature sensor. The DHT11 can be used to sense ambient and surface temperatures. The purpose of the sensor built here is to monitor the ambient temperature of a room to avoid heat rashes on baby over a cycle of 24 hours and display the current temperature, the maximum temperature recorded, and the minimum temperature recorded within that 24-hour cycle on a LCD panel.

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Appendix 1: Program Coding

Chapter 1

1.1 Introduction

Heat rash also known as prickly heat and miliaria is not just for babies. It affects adults, too, especially in hot, humid conditions. Heat rash occurs when sweat is trapped in the skin. Symptoms can range from small blisters to deep, inflamed lumps. Some forms of heat rash are very itchy. The types of heat rash are classified according to how deep the sweat is trapped in the skin. Signs and symptoms for each type vary. The mildest form of heat rash is called miliaria crystallina. It occurs when the opening of the sweat duct on the surface of the skin (sweat pore) is blocked. This form is marked by tiny, clear, fluid-filled bumps that break easily. A type that occurs deeper in the skin is called miliaria rubra. It is sometimes called prickly heat. Signs and symptoms include small, inflamed blister-like bumps and itching or prickling in the affected area. Occasionally, the inflamed bumps of miliaria rubra fill with pus. This form is called miliaria pustulosa. A less common form of heat rash is called miliaria profunda. It affects the deepest layer of the skin (dermis). It causes firm, painful or itchy inflamed bumps that look like goose bumps and may break open. Heat rash develops when a duct that leads from a sweat gland to the surface of the skin is blocked or inflamed. This then blocks the opening of the sweat duct on the surface of the skin (sweat pore). Instead of evaporating, sweat is trapped beneath the skin, causing irritation and bumps on the skin. Factors that increase the risk of heat rash include. Being a new born, as new borns have immature sweat ducts. Living in a hot, humid climate. Heat rash normally goes away without treatment. However, there are medicines available from a pharmacy to ease the symptoms of itching. These include calamine lotion (which helps ease itching) and antihistamine medicines. Your pharmacist may recommend a low-strength hydrocortisone cream, which is a type of steroid cream used to treat inflammation. Speak to pharmacist for further advice and to make sure any medicines you take are suitable for you.You many need antibiotics if the area becomes infected. If experiencing heat rash, here are some things that may help. Try Cool down to avoid sweating. Try to avoid heat and humidity; stay in air conditioning or near a fan, and make sure there is good ventilation and keep the skin dry.

1.2 Project Background

This research introduces an application where the objective is for display temperature in room to monitor the room temperature. It is because high temperature would be a very harmful environment for baby. To avoid thus situation, with this application parents can always monitor the room temperature anytime and it is portable can put anywhere in a close area. It could help them to take any action if the temperature became higher.

This application is to avoid heat rashes that have been a headache to parents and also makes the baby uncomfortable. Some cases have been reported where the baby had massive heat rashes and as identify as unknown death reason. To help to not repeat this type of reason death, this application has been created.

I have not install any buzzer in this project because by having buzzer if the baby were sleeping and buzzer suddenly buzz it will disturb the baby's sleep and will had a sudden heart beat raise can makes a another issue to the baby.

1.3 Problem Statement

In this global warming era, most of the babies are having heat rashes, this medical issue need to be consider as a serious because it can lead to unknown death. Most of the parents are not aware about it. Next, babies temperature gets high easily in hot room. With too high temperature babies hypothalamus could be effected. This is really a serious issue.

1.4 Project Objective

- ✓ To study suitable temperature for baby
- ✓ To design an accurate temperature sensor
- ✓ To display temperature in a room

1.5 Scope of The Project

- Parents that having newborn baby

1.6 Project Significance

This project is for a temperature sensor is a key component of any process heating application as it provides temperature feedback about the process, which can be used to monitor or control the process. Whether the purpose is process maintenance or freeze protection, heat tracer is a common process heating application where sensor placement is critical.

In general, for heating application, it is best to place the sensor in the area with the most extreme process condition. This will decrease risk of an interrupted process caused by unsatisfactory temperatures. Placing the temperature sensor in the coldest expected location of the system will help maintain a process above the desired minimum temperature, and a temperature sensor placement in the hottest expected location will assure the process never exceeds the maximum desired or allowed temperature. While every application is different, special care should always be used in determining the location for optimum process performance.

CHAPTER 2

2.1 Introduction

This chapter is about the literature reviews that provide the information in accordance with the objectives of this project. The relevant information and other extra features were gathered as shown below.

2.2 Literature Review Paper 1:

(Comparison of neonatal skin sensor temperatures with axillary temperature: does skin sensor placement really matter)

Appropriate thermoregulation affects both morbidity and mortality in the neonatal setting. Nurses rely on information from temperature sensors and radiant warmers or incubators to appropriately maintain a neonate's body temperature. Skin temperature sensors must be repositioned to prevent skin irritation and breakdown. This study addresses whether there is a significant difference between skin sensor temperature readings from 3 locations on the neonate and whether there is a significant difference between skin sensor temperatures compared with digital axillary temperatures .The study participants included 36 hemodynamically stable neonates, with birth weight of 750 g or more and postnatal age of 15 days or more, in a neonatal intensive care unit. Gestational age ranged from 29.6 to 36.1 weeks at the time of data collection. A method-comparison design was used to evaluate the level of agreement between skin sensor temperatures and digital axillary thermometer measurements. An analysis of variance for repeated measures was used to test for statistical differences between the skin sensor temperatures. The difference in axillary and skin sensor temperatures was calculated by subtracting the reference standard temperature (digital axillary) from the test temperatures (skin temperatures at 3 different locations), using the Bland-Altman method. The level of significance was set at $P < .05$. No statistically significant differences were found between skin temperature readings obtained from the 3 sites ($F_{2,70} = 2.993$, $P = .57$). Differences between skin temperature readings and digital axillary temperature were also not significant when Bland-Altman graphs were plotted. For hemodynamically stable neonates in a supine position, there were no significant differences between skin sensor temperatures on abdomen, flank, or axilla or between skin sensor temperatures and a digital axillary temperature.

This may increase nurses' confidence that various sites will produce accurate temperature readings.

Paper 2:

(Oscillations of body temperature at night)

There is increasing evidence that overheating is a contributing factor for some cot deaths. One hypothesis is that infant thermoregulation is closely related to respiratory control. To test this hypothesis it was necessary to determine the normal pattern of body temperature in the developing infant. A system has been designed and built to record continuously temperature signals from ambient, rectal, and various skin site sensors. Overnight studies were performed on 30 infants aged between 2 and 26 weeks in a hospital ward. Various time and frequency domain analyses of the temperature data have been developed. Analysis of body temperature rhythms has confirmed patterns during sleep which mature with age. In addition a periodic oscillation of body temperature has been found with a cycle of approximately one hour. This oscillation may reflect sleep state and its further study may give an insight into control of infant thermoregulation and the integration of this control with that of breathing and the cardiovascular system.

Paper 3:

(A Modification of Infant Warmer with Monitoring of Oxygen Saturation, Heart Rate and Skin Temperature)

Full term and premature babies have decreased body temperature by 0.1 ° C-0.3 ° C per minute, infant warmer was developed to provide the effect of heat on the baby as the temperature in the mother's uterus. The purpose of this study is to modify the infant warmer tool by adding parameters SpO2, BPM, and skin sensors. The contribution of this research is that the SpO2, BPM, and skin sensor monitoring systems are very helpful in the therapeutic and healing process using infant warmers.

Paper 4:

(Design of a contactless body temperature measurement system using Arduino)

Health monitoring is a global challenge in peoples life time. The comfort of life lies in a healthy condition which effected by environmental and surgical facts. The measurement of human body vital signs is an important to acknowledge the healthstatus. Theperfrormance of any worker exercise in hot conditionsdisturbsthe balanced thermal homeostasisstate of human body (HB).This balance acknowledgesthe HBabout physiological and cognitive performance of body[1-3]

Paper 5:

(Printable, Highly Sensitive Flexible Temperature Sensors for Human Body Temperature Monitoring)

All life activities of the human body based on metabo-lism and relatively constant body temperature is nec-essary for a healthy metabolism [1]. Hyperthermia or hypothermia will affect the activity of enzymes in the body, thereby affecting the regular operation of human metabolism, causing disorders of various cells, tissues and organs, and even death in severe case

Paper 6:

Skin conditions: common skin rashes in infants

Infants exhibit many skin rashes. Erythema toxicum neonatorum presents as erythematous macules, papules, and pustules on the face, trunk, and extremities; it typically resolves spontaneously within 1 week. Neonatal acne presents as comedones or erythematous papules on the face, scalp, chest, and back. Infantile acne is similar but starts after the neonatal period. Both conditions typically resolve spontaneously; failure to resolve within 1 year warrants evaluation for androgen excess. Neonatal cephalic pustulosis is an acne variant caused by hypersensitivity to Malassezia furfur. It is typically self-limited, but severe cases are managed with topical ketoconazole. Miliaria and milia are caused by sweat retention and present as tiny vesicles or papules; they resolve spontaneously. Contact diaper dermatitis is managed by keeping the diaper area clean and with open air exposure. Diaper dermatitis due to Candida albicans is managed with topical antifungals. Seborrheic dermatitis causes scaling on the scalp. Management involves shampooing and removing scales with a soft brush after applying mineral oil or petrolatum; severe cases are managed with tar or ketoconazole shampoo. Atopic dermatitis is related to food allergy in approximately one-third of children. Food allergy can be confirmed with oral food challenges or skin prick tests. Management includes elimination of irritants and triggers and use of low-potency topical steroid

Paper 7:

Heat-related deaths among crop workers--United States, 1992--2006.

MMWR Morb Mortal Wkly Rep. 2008; 57(24):649-53 (ISSN: 1545-861X)

Workers employed in outdoor occupations such as farming are exposed to hot and humid environments that put them at risk for heat-related illness or death. This report describes one such death and summarizes heat-related fatalities among crop production workers in the United States during 1992--2006. During this 15-year period, 423 workers in agricultural and nonagricultural industries were reported to have died from exposure to environmental heat; 68 (16%) of these workers were engaged in crop production or support activities for crop production. The heat-related average annual death rate for these crop workers was 0.39 per 100,000 workers, compared with 0.02 for all U.S. civilian workers. Data aggregated into 5-year periods indicated that heat-related death rates among crop workers might be increasing; however, trend analysis did not indicate a statistically significant increase. Prevention of heat-related deaths among crop workers requires educating employers and workers on the hazards of working in hot environments, including recognition of heat-related illness symptoms, and implementing appropriate heat stress management measures.

Paper 8:

Baby's Skin.Weatherspoon D *International Journal of Childbirth Education (2018) 33(2) 13-17*

A neonate's skin serves many important roles, is fragile, and requires special care. The childbirth educator may be called on to give sound, evidencebased advice to caregivers who have concerns about their baby's skin. This article reviews the basics in newborn skin care with qualified recommendations on skin imperfections. Neonatal skin alterations are reviewed and include erythema toxicum neonatorum, milia, sebaceous glands, baby acne, and cradle cap. Babies are also affected by too much moisture which can result in drool rashes, heat rashes, and diaper rashes. These rashes are common and treatable with proficient guidance. Other skin concerns are presented such as skin discolorations. Childbirth educators play an important role in providing this much needed education and reassurances.

Paper 9:

New-born skin: Part I. Common rashes Nina R O'Connor [1], Maura R McLaughlin, Peter Ham

Rashes are extremely common in newborns and can be a significant source of parental concern. Although most rashes are transient and benign, some require additional work-up. Erythema toxicum neonatorum, acne neonatorum, and transient neonatal pustular melanosis are transient vesiculopustular rashes that can be diagnosed clinically based on their distinctive appearances. Infants with unusual presentations or signs of systemic illness should be evaluated for Candida, viral, and bacterial infections. Milia and miliaria result from immaturity of skin structures. Miliaria rubra (also known as heat rash) usually improves after cooling measures are taken. Seborrheic dermatitis is extremely common and should be distinguished from atopic dermatitis. Parental reassurance and observation is usually sufficient, but tar-containing shampoo, topical ketoconazole, or mild topical steroids may be needed to treat severe or persistent cases.Miliaria

Miliaria, also called sweat rash,[1] is a skin disease marked by small, itchy rashes due to sweat trapped under the skin by clogged sweat-gland ducts. Miliaria is a common ailment in hot and humid conditions, such as in the tropics and during the summer.[2] Although it affects people of all ages, it is especially common in children and infants due to their underdeveloped sweat glands.

Miliaria can be classified according to the top level at which obstruction occurs in the sweat glands.

Miliaria crystalline

The most superficial obstruction (with the most mild clinical presentation), is known as miliaria crystalline; instead of a rash, the patient presents with multiple, tiny, blister-like lesions that look like beads of perspiration and essentially cause no symptoms.[4]:23[5] Miliaria crystalline is also known as

miliaria crystallina,[6] and sudamina. The superficial vesicles are not associated with an inflammatory reaction.[4]:23

Miliaria rubra

The most commonly encountered form of the illness is miliaria rubra, in which obstruction causes leakage of sweat into the deeper layers of the epidermis, provoking a local inflammatory reaction and giving rise to the typical appearance of redness (hence rubra) and larger (but still only a few millimetres), blister-like lesions. This form of the illness is often accompanied by the typical symptoms—intense itching or "pins and needles" with a lack of sweating (anhidrosis) to affected areas.[4]:23 A small risk of heat exhaustion exists due to inability to sweat if the rash affects a large proportion of the body's surface area or the patient continues to engage in heat-producing activity. Miliaria rubra is also known as prickly heat and heat rash.[6] Differential diagnosis should be used to rule out polycythemia vera, which is a rare hematological disorder and appears more often in males than females, generally not before the age of 40. Both disorders share a common trait of appearing after taking a hot shower.[*citation needed*]

Miliaria profunda

The most severe form of miliaria, miliaria profunda, sometimes referred to as "wildfire" due to the rapid spread and severe burning sensations, generally occurs as a complication of repeated episodes of miliaria rubra. The obstruction is deep in the structure of the sweat gland, causing the gland's secretions to leak between the superficial and deep layers of the skin. The rash and associated symptoms tend to appear within hours of an activity provoking sweating, but similarly fade within hours when the stimulus for the sweating is removed. Miliaria profunda is characterised by nonpruritic, flesh-coloured, deep-seated, whitish papules.[4]:24 The rash tends to be flesh-coloured as opposed to the prominent redness of miliaria rubra, and the risk of heat exhaustion is larger. Miliaria profunda is also less commonly known as "mammillaria"[6]:chapter 40 [7]

Miliaria pustulos

Miliaria pustulosa describes pustules due to inflammation and bacterial infection.[8] Miliaria pustulosa is preceded by another dermatitis that has produced injury, destruction, or blocking of the sweat ducts.[4]:23

Postmiliarial hypohidrosis

Postmiliarial hypohidrosis is a skin condition that results from occlusion of sweat ducts and pores, and may be severe enough to impair an individual's ability to perform sustained work in a hot environment.[4]:24

Tropical anhidrotic asthenia

Tropical anhidrotic asthenia is a skin condition, a rare form of miliaria, with long-lasting poral occlusion, which produces anhidrosis and heat retention.[4]:24[6]

Occlusion miliari

Occlusion miliaria is a skin condition that is accompanied by anhidrosis and increased heat-stress susceptibility, all after the application of extensive polyethylene film occlusion for 48 hours or longer.[4]:24

Colloid milium

Colloid milium is a skin condition characterized by a translucent, flesh-colored, or slightly yellow, 1 to 5 mm papules.[4]:31

Pathophysiology

Miliaria occurs when the sweat gland ducts get clogged due to dead skin cells or bacteria such as *Staphylococcus epidermidis*,[9] a common bacterium that occurs on the skin, which is also associated with acne.

The trapped sweat leads to irritation (prickling), itching, and a rash of very small blisters, usually in a localized area of the skin.

Paper 10:

Dermatoses in the Nigerian newbornDermatoses are common findings in newborns and their pattern varies from one geographical location to another. One hundred and thirty one babies aged between 1 and 7 days delivered at the post natal ward of the State Hospital, Osogbo South Western Nigeria over a 3 month time period were studied. The 131 babies consisted of 66 boys and 65 girls, thus giving a male to female ratio of 1:1. One hundred and twenty six babies (96.2%) had dermatoses, while 5(3.8%) did not Mongolian spot, miliaria, salmon patch, erythema toxicum, nevus, milia, cafe au lait spots and sebaceous hyperplasia were seen in 87(30.6%), 70(24.6%), 54(19.0%), 38(13.4%), 14(4.9%), 13(4.6%), 5(1.8%) and 3(1.1%), respectively. Milia and sebaceous hyperplasia had a female predilection while the remaining dermatoses were more common in the male sex. Dermatoses were located on the buttocks, face, fore heads, napes, lower limbs, chest, eyelids, noses, upper limbs, necks, abdomen, backs and ears in 81(24.7%), 70(21.3%), 58(17.7), 38(11.6%), 15(4.6%), 14(4.3%), 12(3.7%), 9(2.7%), 9(2.7%), 7(2.1%), 7(2.1%), 7(2.1%) and 1(0.3%) cases, respectively. Of the 126 mothers whose babies had rashes, 28 (22.2%) were able to detect heat rashes in their babies prior to being examined. Most of the dermatoses recorded were benign. The cafe au lait spots on one of the 131 babies was a pointer to the diagnosis of neurofibromatosis. It is concluded that benign dermatoses of the newborn is common among the Nigerian newborn. The health care giver thus needs to be conversant with the dermatoses in his environment in other to manage them properly.

3.3 Chapter Summary:

This section focusing on two section which is one section is for gather the problem that been faced because of heat and also skin condition that infants faced. Another one section is about temperature sensor project that been done by researcher.

Chapter 3

3. METHODOLOGY

Hardware Products that we used. It consists of Arduino microcontroller and DHT11 temperature and humidity sensor

3.1 Arduino R3

Arduino UNO is a microcontroller board based on the **ATmega328P.** It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, 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 a AC-to-DC adapter or battery to get started.

3.2 DHT11 Temperature and Humidity Sensor

The DHT11 is a basic, ultra low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on the data pin (no analog input pins needed). Its fairly simple to use, but requires careful timing to grab data.

3.3 Block Diagram

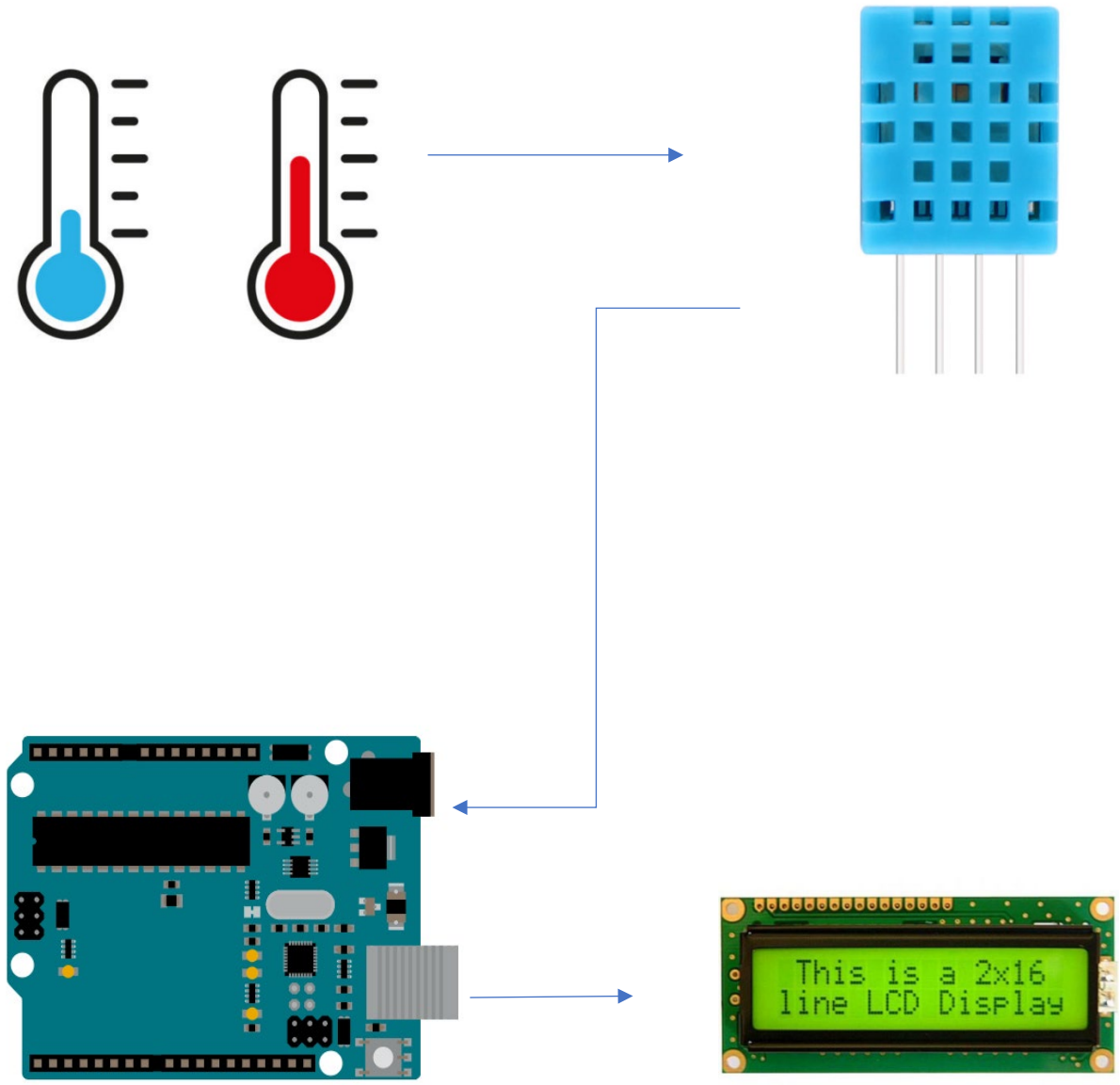


Figure 3.3.1

3.4 Flowchart

The flow diagram of methodology that has been used in this project is shown below. It consists of temperature, sensor, Arduino and display.

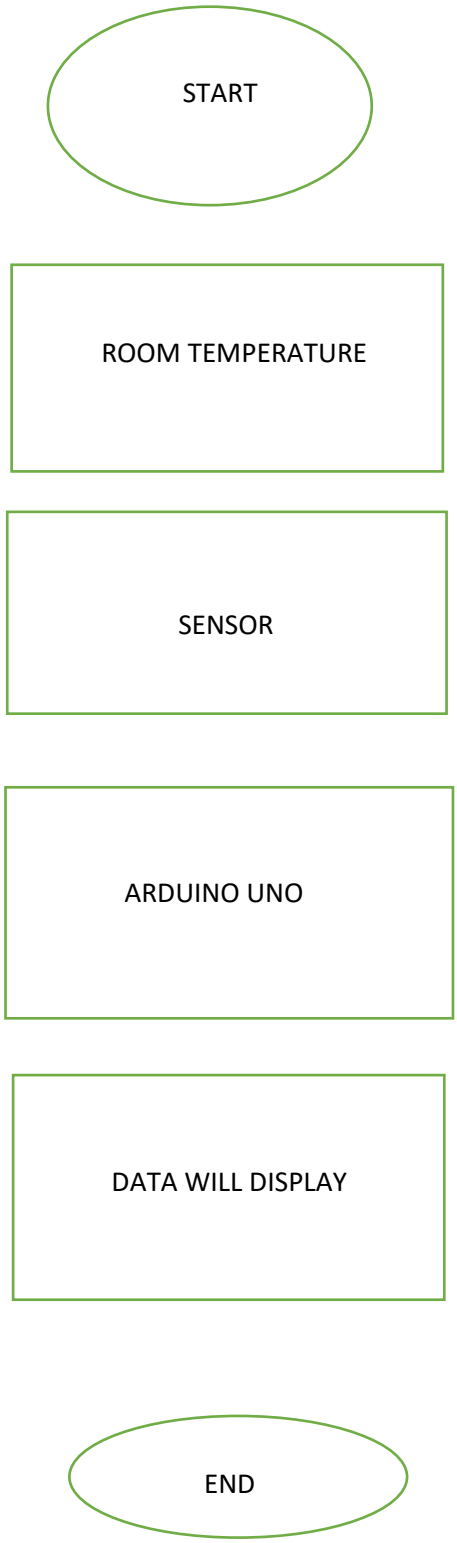


Figure 3.4.1

3.5 Project Description

A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. A for my project I made a temperature sensor to avoid baby from having heat rashes. Heat rashes always not been a serious health issue among parents, but it is a serious issue because it can lead to an unknown death. By having this temperature sensor parents can view and adjust the temperature**.**

3.6 PROTOTYPE DEVELOPMENT

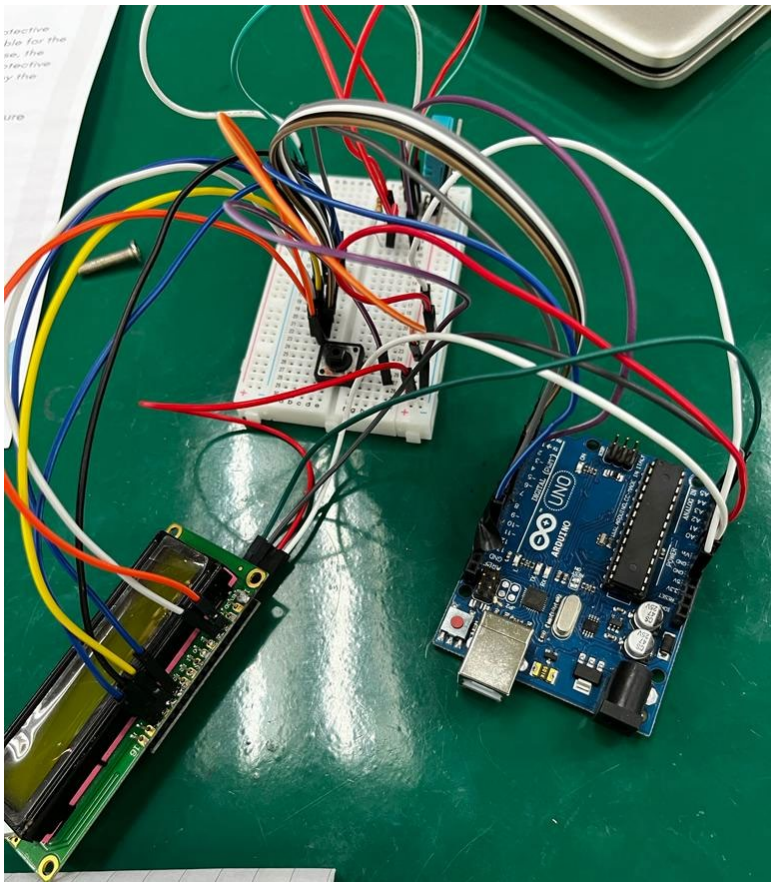


Figure 3.6.1 Example of my project

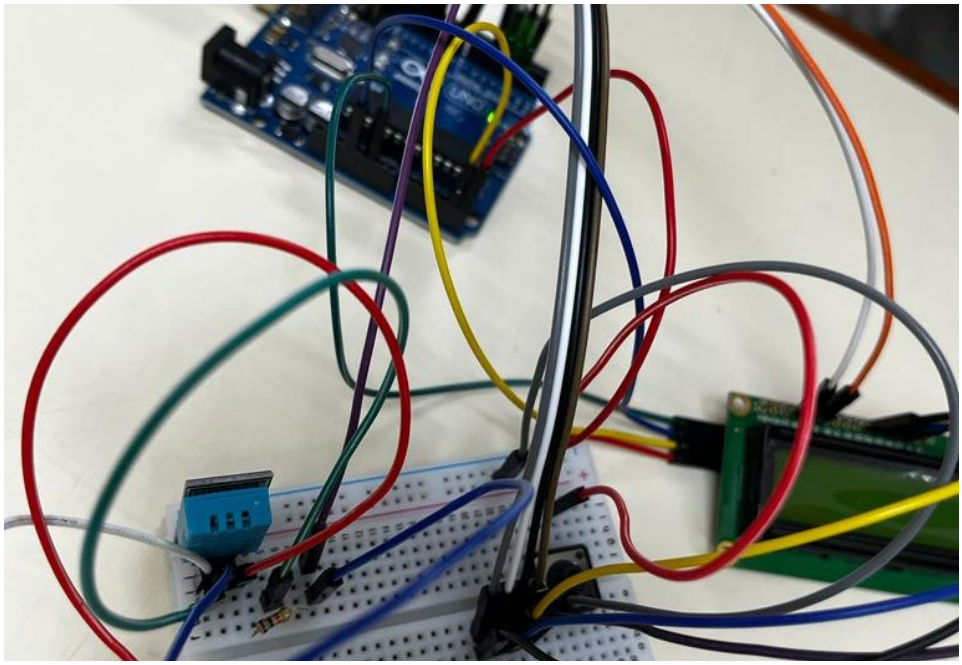


Figure 3.6.2 Example of temperature sensor

3.7 Project Hardware

- Arduino (UNO R3)
- Breadboard
- DHT11 temperature and humidity sensor
- 10k ohm potentiometer
- 16x2 LCD screen
- USB A-B cable
- Jumper Wires

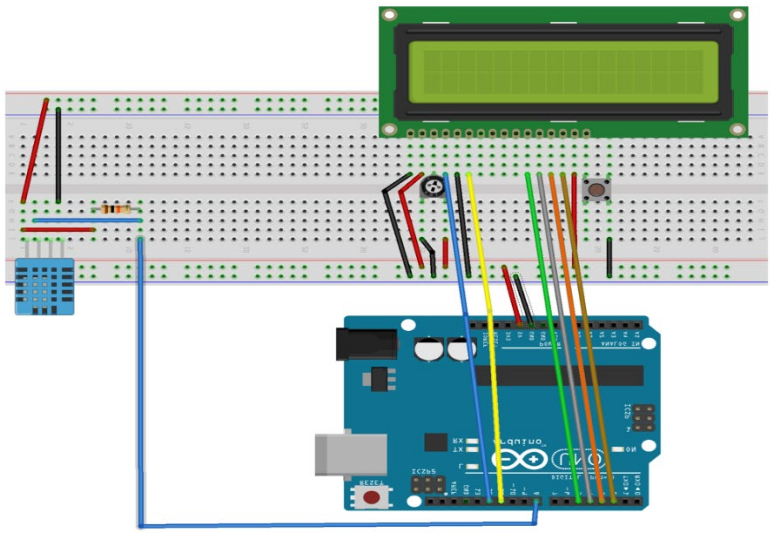


Figure 3.7

Figure 3.7 is the schematic circuit of my project.

3.8.1 Description of main components

Arduino Uno R3

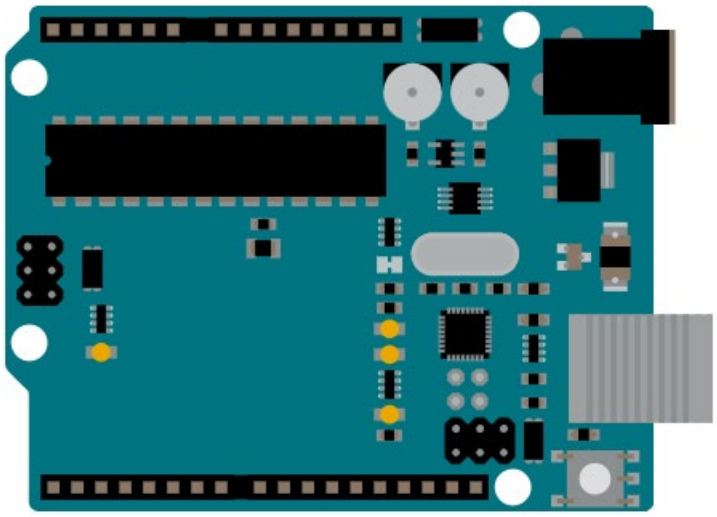


Figure 3.8.1.1

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.

DHT11 Temperature & Humidity Sensor (4pins)

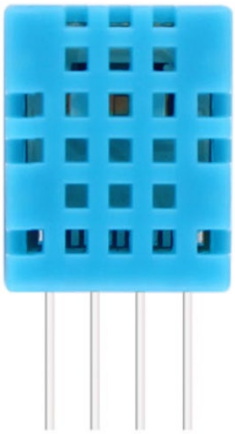


Figure 3.8.1.2

The temperature range of DHT11 is from 0 to 50 degree Celsius with a 2-degree accuracy. Humidity range of this sensor is from 20 to 80% with 5% accuracy. The sampling rate of this sensor is 1Hz . i.e. it gives one reading for every second.

LCD

Figure 3.8.1.3

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly,

instead using a backlight or reflector to produce images in color or monochrome.

3.9 Circuit Operation

```
// include the library code:
#include <LiquidCrystal.h>
#include "DHT.h"

// set the DHT Pin
#define DHTPIN 8

// initialize the library with the numbers of the interface pins
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);

void setup() {
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
  dht.begin();

  // Print a message to the LCD.
  lcd.print("Temp:  Humidity:");
```

Figure 3.9.1 Coding Arduino

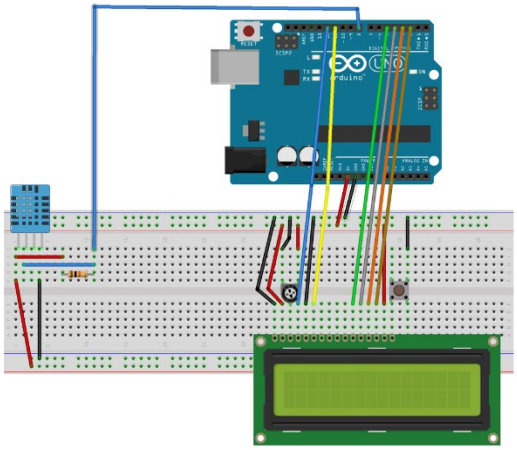


Figure 3.3.3.2 Schematic Diagram

3.10 Project Software

3.10.1 TinkerCad

Figure 3.10.1 Used to design schematic diagram

3.10.2 Arduino Sofware

Figure 3.10.2 shows the Arduino Software, this product utilized a simplified version of C++ and making it simpler to learn with the program of the product. To utilize the Arduino pins, the users need to characterize which pin is being to be utilize

3.11 Chapter Summary

This chapter is about fundamental piece of this undertaking which is the structure of how “Temperature Sensor ” going to be done and every progression of the strategy is correctly followed. All equipment and programming have its means in interfacing towards each other, which makes this section are one of the definitive parts all through this task.

4. RESULTS AND DISCUSSION

4.1 Introduction

In preparing the final project, analysis and discussion are carried out to ensure the project results are in the desired state without causing any problems. Project analysis is performed to determine, select and produce an optimal design in terms of material usage, cost and perfect manufacturing methods. The analysis is more focused on project characteristics, problems encountered and the cost of materials used such as the price of raw materials used and experiments conducted and other items involved.

4.2 Result

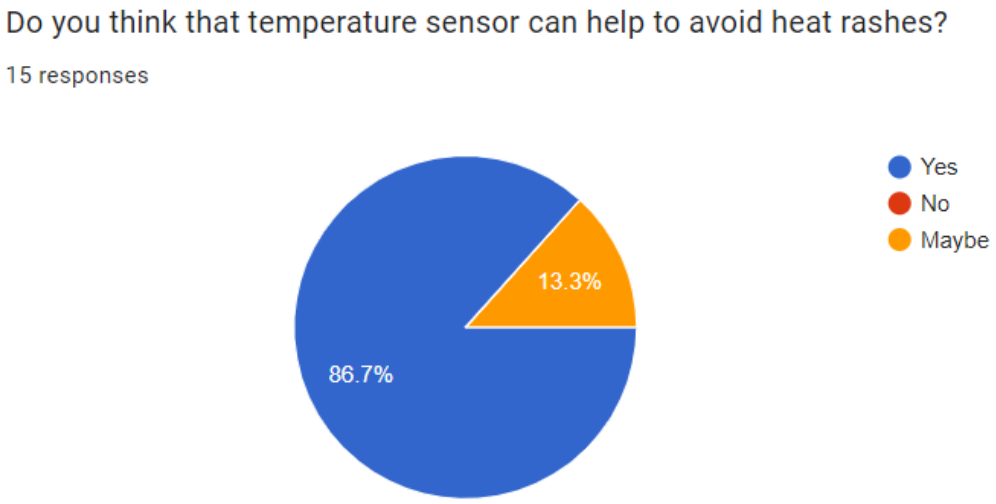
1. Sensor work and detect the heat of user.

2. temperature sensor working

4. Arduino has a good performance.

5. LCD doesn't display the result

4.3 Analysis



4.4 Cost

No.	Material	Quantity	Price
1.	DHT11	1	RM 5.00
2.	LCD 16X2	1	RM 9.00
3.	ARDUINO UNO	1	RM 52.00
4.	RESISTOR	1	RM 1.00

No	Material	Quantity	Price
1.	Jumper wire	1	RM 3.90
2.	Breadboard	1	RM 2.50
3.	Casing	1	RM 16.00

4.5 Summary

Through this methodological research I were able to understand the demand or the hype for the system and the potential of the temperature sensor among todays society.

Chapter 5

5.1 Conclusion

From this project, it got to encourage the self-expression of thoughts and and feelings related with illness/hospitalization. And also, help patient process and work through traumatic experiences associated with hospitalization. Next to facility positive selfesteem and positive body image, and promote a sense of independence and feelings of control. Encourage the development of healthy strategies for coping with hospitalization. The main result of this project is to help to measure the temperature to prevent Heat Rashes among the babies. Most of the rehab process is depends on feeling of patient and judgement by doctor. Sometimes the judgement could be wrong. With this project it got to resolve this problem and give an accurate rehab level things to patient. The resulting system was also low in power and cost, non - invasive, and provided real time monitoring. It is also easy to use and provides accurate measurements

5.2 Recommendation

I would like add IOT design to this project that can makes easy for parents to take action via virtualy. Besides, I would like to add alarm that won’t disturb the baby sleep.

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Program Coding

```
:\Program Files (x86)\Arduino\arduino-builder -dump-prefs -
logger=machine -hardware C:\Program Files (x86)\Arduino\hardware -
tools C:\Program Files (x86)\Arduino\tools-builder -tools C:\Program
Files (x86)\Arduino\hardware\tools\avr -built-in-libraries C:\Program
Files (x86)\Arduino\libraries -libraries
C:\Users\PARVA\Documents\Arduino\libraries -fqbn=arduino:avr:uno
-ide-version=10612 -build-path
C:\Users\PARVA\AppData\Local\Temp\arduino_build_374170 -
warnings=none -prefs=build.warn_data_percentage=75 -
prefs=runtime.tools.avrdude.path=C:\Program Files
(x86)\Arduino\hardware\tools\avr -prefs=runtime.tools.avr-
gcc.path=C:\Program Files (x86)\Arduino\hardware\tools\avr -verbose
C:\Users\PARVA\Downloads\dht11av\dht11av.ino
C:\Program Files (x86)\Arduino\arduino-builder -compile -
logger=machine -hardware C:\Program Files (x86)\Arduino\hardware -
tools C:\Program Files (x86)\Arduino\tools-builder -tools C:\Program
Files (x86)\Arduino\hardware\tools\avr -built-in-libraries C:\Program
Files (x86)\Arduino\libraries -libraries
C:\Users\PARVA\Documents\Arduino\libraries -fqbn=arduino:avr:uno
-ide-version=10612 -build-path
C:\Users\PARVA\AppData\Local\Temp\arduino_build_374170 -
warnings=none -prefs=build.warn_data_percentage=75 -
prefs=runtime.tools.avrdude.path=C:\Program Files
(x86)\Arduino\hardware\tools\avr -prefs=runtime.tools.avr-
gcc.path=C:\Program Files (x86)\Arduino\hardware\tools\avr -verbose
C:\Users\PARVA\Downloads\dht11av\dht11av.ino
Using board 'uno' from platform in folder: C:\Program Files
(x86)\Arduino\hardware\arduino\avr
Using core 'arduino' from platform in folder: C:\Program Files
(x86)\Arduino\hardware\arduino\avr
Detecting libraries used...
"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c
-g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections
-fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -
mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -
DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files
(x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program
Files (x86)\Arduino\hardware\arduino\avr\variants\standard"
"C:\Users\PARVA\AppData\Local\Temp\arduino_build_374170\sketch
\dht11av.ino.cpp" -o "nul"
```

"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c -g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections -fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\variants\standard" "-IC:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src" "C:\Users\PARVA\AppData\Local\Temp\arduino_build_374170\sketch\dht11av.ino.cpp" -o "nul"
"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c -g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections -fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\variants\standard" "-IC:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src" "-IC:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master"
"C:\Users\PARVA\AppData\Local\Temp\arduino_build_374170\sketch\dht11av.ino.cpp" -o "nul"
"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c -g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections -fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\variants\standard" "-IC:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src" "-IC:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master" "C:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src\LiquidCrystal.cpp" -o "nul"
"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c -g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections -fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\variants\standard" "-IC:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src" "-

IC:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master" "C:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master\DHT.cpp" -o "nul"
"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c -g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections -fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\variants\standard" "-IC:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src" "-IC:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master" "C:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master\DHT_U.cpp" -o "nul"
"C:\Program Files (x86)\Arduino\hardware\tools\avr/bin/avr-g++" -c -g -Os -w -std=gnu++11 -fpermissive -fno-exceptions -ffunction-sections -fdata-sections -fno-threadsafe-statics -flto -w -x c++ -E -CC -mmcu=atmega328p -DF_CPU=16000000L -DARDUINO=10612 -DARDUINO_AVR_UNO -DARDUINO_ARCH_AVR "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\cores\arduino" "-IC:\Program Files (x86)\Arduino\hardware\arduino\avr\variants\standard" "-IC:\Program Files (x86)\Arduino\libraries\LiquidCrystal\src" "-IC:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master" "C:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master\DHT_U.cpp" -o "C:\Users\PARVA\AppData\Local\Temp\arduino_build_374170\preproc\ctags_target_for_gcc_minus_e.cpp"
In file included from C:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master\DHT_U.cpp:22:0:

C:\Users\PARVA\Documents\Arduino\libraries\DHT-sensor-library-master\DHT_U.h:25:29: fatal error: Adafruit_Sensor.h: No such file or directory

#include <Adafruit_Sensor.h>