[AUTOMATIC WATER HEATER]

**A Course Project report Submitted in partial fulfillment of the Academic requirements for the award of the degree of**

**Bachelor of Technology**

Submitted by

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**UNDER THE COURSE**

**ENGINEERING EXPLORATION & PRACTICE**

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**CENTRE FOR ENGINEERING EDUCATION RESEARCH**

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**

**(Autonomous)**

**(NAAC Accredited with ‘A’ Grade & NBA Accredited)**

**(Approved by AICTE, Permanently Affiliated to JNTU Hyderabad)**

**KANDLAKOYA, MEDCHAL ROAD, HYDERABAD-501401**

**2019-20**

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**CERTIFICATE**

This is to certify that the course project report entitled **“AUTOMATIC WATER HEATER”** is a bonafide work done by **D.Narsimha (19H51A04J7), G.Ganendhar (19H51A05K3), P.Arpitha (19H51A05L3), K.Sravani (19H51A04K6), P.SHIVASAI(19H51A05L5)** of I B.Tech II Sem, in partial fulfillment of the requirements for the award of the degree of Bachelor of Technology, submitted to Centre for Engineering Education Research, CMR College of Engineering & Technology, Hyderabad during the Academic Year 2019-20.

**(Names of the project coordinators) (Mrs.D. sowjanya)**

1. B. Suresh Ram HOD

2. K. Ravi Kiran CEER

3. V. Vinayak

**DECLARATION**

We, the students of I B.Tech I B.Tech II Sem of Centre for Engineering Education Research , CMR COLLEGE OF ENGINEERING & TECHNOLOGY, Kandlakoya, Hyderabad, hereby declare, that under the supervision of our guide course coordinators, we have independently carried out the project titled “**AUTOMATIC WATER HEATER**” and submitted the report in partial fulfillment of the requirement for the award of Bachelor of Technology in by the Jawaharlal Nehru Technological University, Hyderabad (JNTUH) during the academic year 2019-2020.

Name, Roll Number and Signature of the students

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Finally, we thank all our faculty members and Lab Assistants for their valid support.

We own all our success to our beloved parents, whose vision, love and inspiration has made us reach out for these glories.

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**ABSTRACT**

As the technology is being increased in a wide range so in order to reduce the man power and wastage of electric current there are many techniques which are evolving in market i.e. solar heaters, gas hot water systems etc.

Thus, the aim of this project is to minimize the power consumption and also the man power in order to overcome the present problem we did a prototype system of automatic water heater with Arduino and temperature sensor (LM 35 temperature sensor) whereas this sensor is used to detect the temperature.

Arduino is an open source electronic prototyping platform and it is flexible and easy to use in hardware and software and temperature sensor detects the given temperature and automatically turns off the water heater.

In this way the power consumption is minimized and it is not necessary to watch regularly.

### 1. INTRODUCTION

Water heating is a thermodynamic process that uses an energy source to heat water above its initial temperature. Typical domestic uses of hot water include cooking, cleaning, bathing, and space heating. In industry, hot water and water heated to steam have many uses. Domestically, water is traditionally heated in vessels known as water heaters, kettles, cauldrons, pots, or coppers. These metal vessels that heat a batch of water do not produce a continual supply of heated water at a preset temperature. Rarely, hot water occurs naturally, usually from natural hot springs. The temperature varies based on the consumption rate, becoming cooler as flow increases. Appliances that provide a constant supply of hot water are variously called water heaters, hot water heaters, hot water tanks, boilers, heat exchangers, geysers, or calorifiers, These names depend on region, and whether they heat potable or non-potable water, are in domestic or industrial use, and their energy source. In domestic installations, potable water heated for uses other than space heating is also called domestic hot water (DHW).

### 2.LITERATURE REVIEW

The motive of the project is to turn off the heater automatically. That it can save the power and it will save the electricity bill. In this proposed system, the machine is operated by itself as we connected Arduino to it with a specific code. Hence the system avoid more heating. This helps them to not waste power & to reduce electricity bill.

**Existing Models:**



**1. Gas Hot Water System:** A gas hot water system is a water heating system where the main fuel used is gas. Hot water systems that use gas haven’t been as common in Australia traditionally as the humble electric tank, although that is starting to change as the gas grid has expanded and modern style electronic ignition continuous flow water heaters that have features like touch pad temperature evolved

### 2.Electric Hot Water System: Electric storage systems use a heating element located inside a tank to heat water, similar to the way an electric kettle works. Water is heated and stored in the tank, available in various sizes, where it is kept hot and ready to be used.

### 

### 3. Heat Pump Water Heater: Heat pump water heaters use a small amount of electricity to move heat from one place to another, rather than generating heat directly. To heat water, a heat pump works like a refrigerator in reverse. There are different types of heat pump systems but the most common type are when the evaporator absorbs whatever heat energy is available from the air and vaporizes the refrigerant. This vapor is then compressed raising its pressure and temperature. Cold water from the storage tank is now pumped through the evaporator heat exchanger with the now heated water returning back to the storage cylinder.

### 3.PROBLEM DEFINITION

### 3.1 Problem statement

People often forget to switch off the power supply of electric water heater after the water is heated due to which electricity is wasted unnecessarily and power charges also increases implement an automatic water heater which turns off automatically when water is heated.

**3rd version of problem statement:**

Design a water heater which turns off automatically when water is heated and a buzz sound and led should glow as an indication that water is heated and make it implementable for normal usage.

### 3.2 Objective

1)The model should automatically turn off the power supply to the water heater when water is heated

2)The buzzer must produce a sound when water is heated as an indication

3)The LED must glow as an indication

### 3.3 Requirement Analysis

### HARDWARE COMPONENTS SOFTWARE COMPONENTS

Arduino UNO Arduino Programmer (IDE)

Breadboard Embedded c language

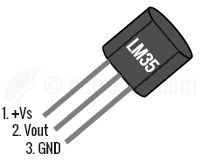
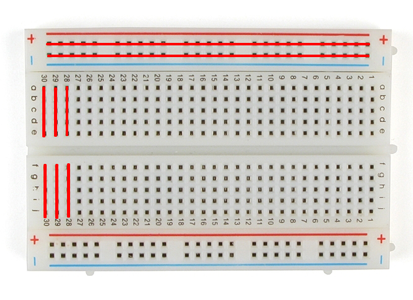
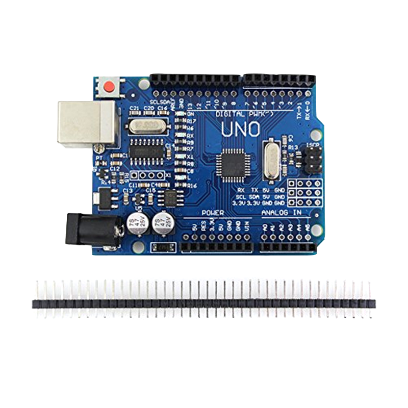
Temperature sensor

Led

Buzzer

Resistor

Jumper wires



### When you can not recognize your resistor band code – Passive Components Blog

### 3.4 Methodology

### This project is mainly depending on temperature reading and the code plays a vital role.

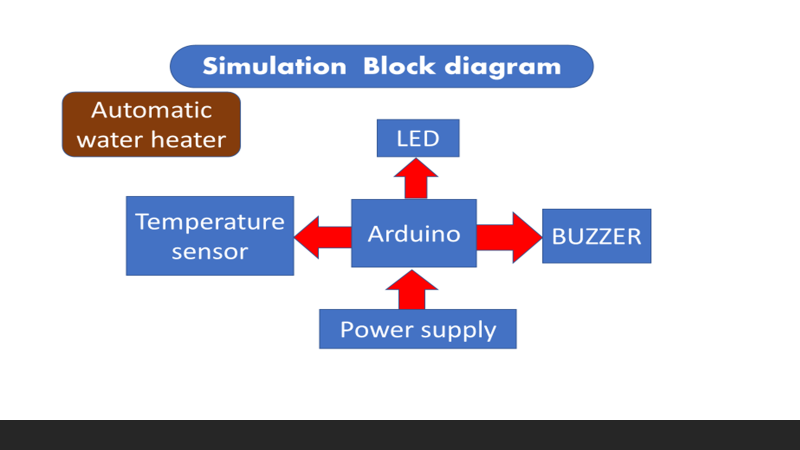
### Initially the temperature sensor detects the temperature and pass the input to relay. Then relay stops the current flow by stop the current flow from the switch to heater.

### In simulation We used LED and Buzzer has indicators, In that we set a temperature of 100 degrees. We will set our desired temperature as condition one.

### So, at that particular temperature the led and buzzer turns ON and remain time it stays in off mode.

### 4.1 Conceptual Design:

### The prototype is making the human life more secure with comfortable budget for the clients. The device is used to reduce power wastage and avoid current bill.

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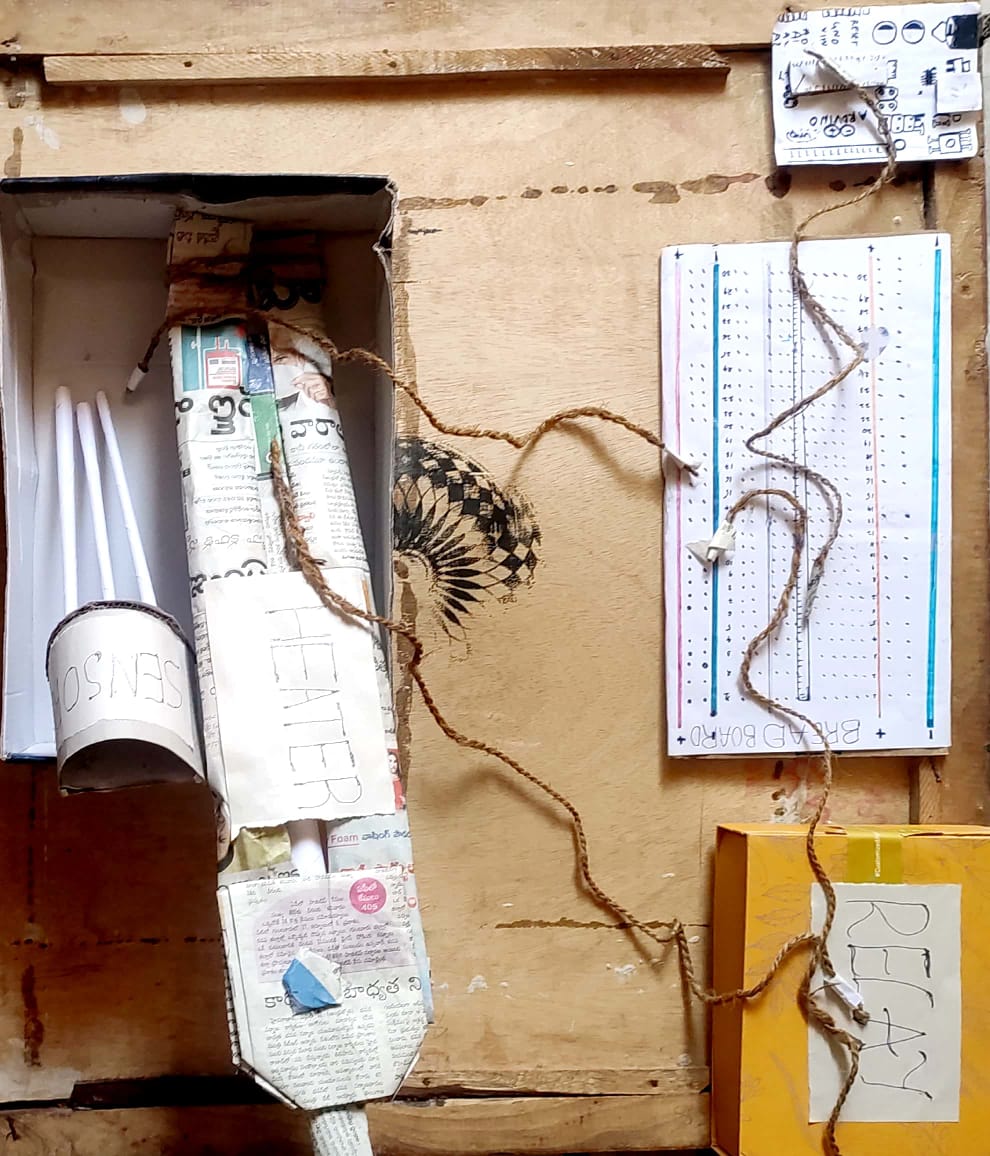
**4.2 Block diagram**

### 

**4.3 Design Description**

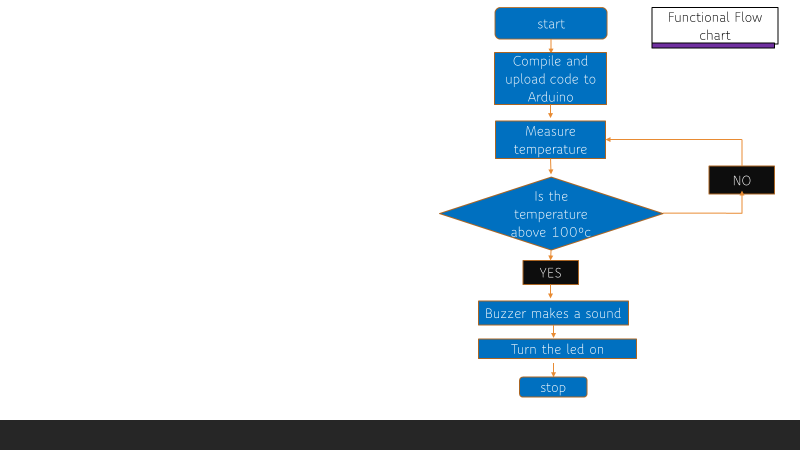
We are proposing an automatic water heater. In this hardware kit we used Arduino UNO, Temperature Sensor, Bread Board, LED, Jumper wires, Buzzer, Resistor. The temperature sensor detects the temperature of water. We can give code through the Arduino uno which controls the whole thing.

### Paper models



![](data:application/octet-stream;base64,)![](data:application/octet-stream;base64,)

### Flow Chart



**5. Implementation**

**5.1 Results And Discussions**

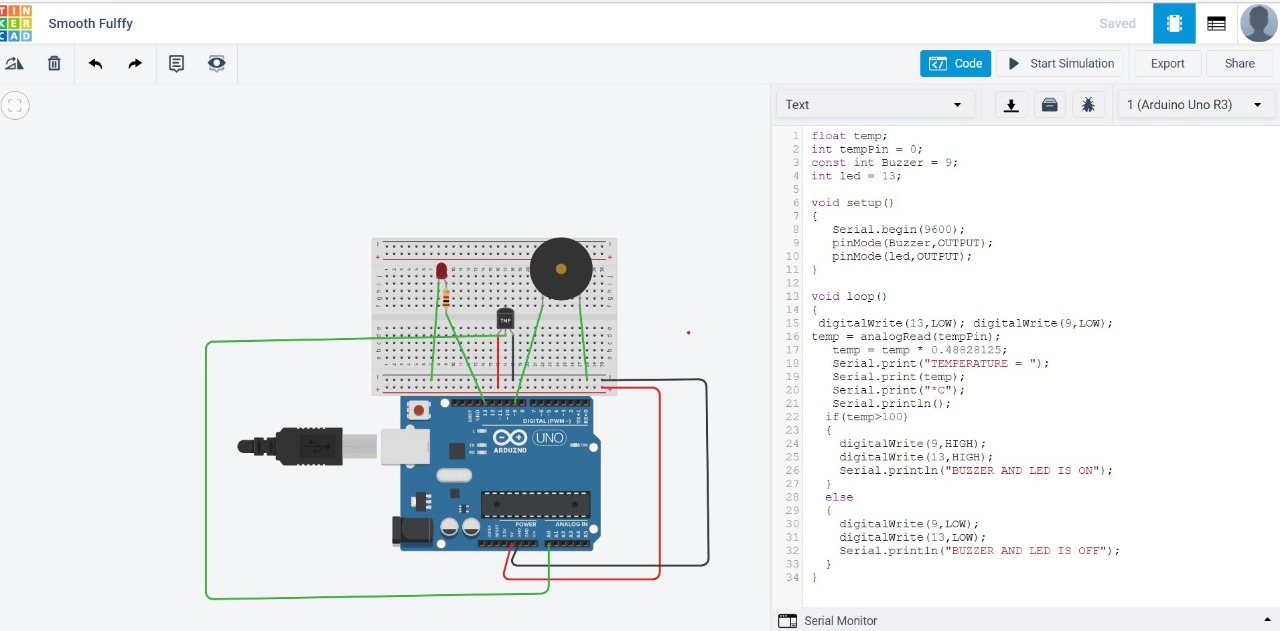
The main purpose of designing an automatic water heater is to reduce power wastage and less electricity bill.

The automatic water heater is useful for every one who are using normal water heater. Because, if they forget to switch off the heater then they get more electricty bill and more power wastage.

The components that we used in Tinkercad are

1.LED 2.BUZZER 3.Temperature sensor 4.Bread Board 5.jumper wires

6.Arduino UNO

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**5.2 Conclusions**

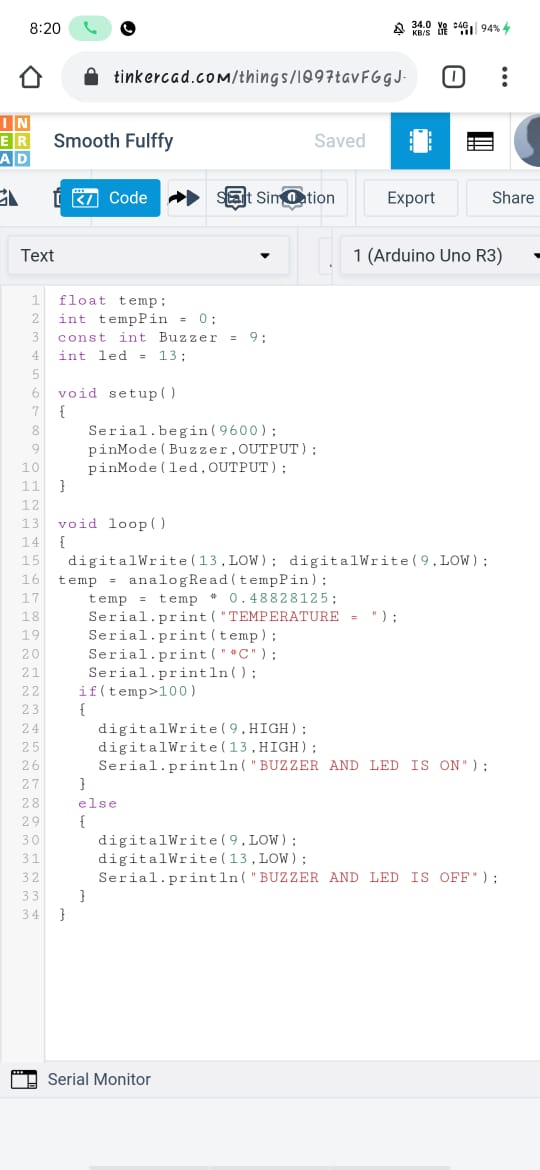
By completing this project, the Arduino based automatic water heater can turn off automatically when a certain temperture is reached. Then the temperature sensor detects and pass to relay and the relay stops the current flow in that way we can save power and save electricty bills.

**6.APPENDIX**

### 6.1 References

* <https://en.wikipedia.org/wiki/Water_heating>
* <https://www.wattco.com/product_category/screw-plug-heaters/>
* <https://en.wikipedia.org/wiki/List_of_temperature_sensors>
* <https://www.fallonsolutions.com.au/information-handy-hints/what-are-the-pros-and-cons-of-different-hot-water-systems>
* <https://summitheatingco.com/advantages-and-disadvantages-of-various-types-of-water-heaters/>
* <https://www.4abc.com/blog/the-advantages-and-disadvantages-of-different-hot-water-heater-designs>

### 6.2 Source code



### Tinker cad Simulation

<https://www.tinkercad.com/things/8WZV1XvPLOY-eep-simulation-project/editel>