

**SINHGAD INSTITUTE OF TECHNOLOGY**

***DEPARTMENT OF COMPUTER ENGINEERING***

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**PROJECT REPORT ON**

**SMART DUSTBIN USING RASPBERRY-PI**

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**Chapter 1**

***ABSTRACT***

In the recent decades, Urbanization has increased tremendously. At the same phase there is an increase in waste production. Waste management has been a crucial issue to be considered. This paper is a way to achieve this good cause. In this paper, smart bin is built on a microcontroller based platform Raspberry-pi board which is interfaced with Ultrasonic sensor. Ultrasonic sensor is placed at the top of the dustbin which will measure the stature of the dustbin. The threshold stature is set as 10cm. Once the dustbin is squashed,people can reuse the dustbin. At regular intervals dustbin will be squashed. Once these smart bins are implemented on a large scale, by replacing our traditional bins present today, waste can be

managed efficiently as it avoids unnecessary lumping of wastes on roadside. Foul smell from these rotten wastes that remain untreated for a long time, due to negligence of authorities and carelessness of public may lead to long term problems. Breeding of insects and mosquitoes can create nuisance around promoting unclean environment. This may even cause dreadful diseases.The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote teaching of basic computer science in schools and in developing countries. The original model became far more popular than anticipated,[8] selling outside its target market for uses such as robotics. It does not include peripherals (such as keyboards and mice) and cases. However, some accessories have been included in several official and unofficial bundles

**Chapter 2**

***HARDWARE REQUIREMENT***

1.ultrasonic sensor

2.led

3.bread board

4.jumper wires

5. 1k , 2k resistores

6.Dustbin

7.power bank

**Chapter 3**

***BRIEF DESCRIPTION OF HARDWARE USED***

In this project we used above mention hardware in which ultrasonic sensor is used for measuring waste levels in dustbin where we are attaching three led's as per levels of waste , when the dustbin is empty first led will blink and so on, when third led blinks it will show that dustbin is completely filled and then comes the work of twillio module which will send message to user who is responsible for collecting the waste. A breadboard is a platform you can use to build and test electronic circuits, usually without having to do any soldering. Certain parts of the breadboard are wired together so that electricity can flow from component to component in orderly rows. The term "jumper wire" simply refers to a conducting wire that establishes an electrical connection between two points in a circuit. You can use jumper wires to modify a circuit or to diagnose problems in a circuit. The following steps outline how you can safely use jumper wires in different electrical applications. resistors are used to manage voltage in raspberry-pi circuit.power bank is used for power supply for Raspberry pi.

**Chapter 4**

***SOFTWARE USED***

The project of smart dustbin consist of twilio module for sending messages to the user and software interface of raspbery-pi and the code is written in leafpad text editor and the code is run on terminal of raspberry-pi .VNC software is used to connect the Raspberry pi with Laptop.

**Chapter 5**

***INTERFACING AND CODING OF THE PROJECT***

import RPi.GPIO as GPIO

import time

from twilio.rest import Client

account\_sid = 'AC74a6780981669b1d7da084a66896657a'

auth\_token = '81e2fd3c52e3ce58c6956eddd35253fc'

client = Client(account\_sid, auth\_token)

GPIO.setmode(GPIO.BOARD)

GPIO.setwarnings(False)

PIN\_TRIGGER = 7

PIN\_ECHO = 11

#print("Waiting....")

GPIO.setup(PIN\_TRIGGER,GPIO.OUT)

GPIO.setup(PIN\_ECHO,GPIO.IN)

GPIO.setup(13,GPIO.OUT)

GPIO.setup(19,GPIO.OUT)

GPIO.setup(23,GPIO.OUT)

while True:

GPIO.output(PIN\_TRIGGER,GPIO.LOW)

print("Waiting for sensor to settle")

print("Calculating distance:-")

GPIO.output(PIN\_TRIGGER,GPIO.HIGH)

GPIO.output(PIN\_TRIGGER,GPIO.LOW)

while GPIO.input(PIN\_ECHO)==0:

pulse\_start\_time = time.time()

while GPIO.input(PIN\_ECHO)==1:

pulse\_end\_time= time.time()

pulse\_duration = pulse\_end\_time - pulse\_start\_time

distance = round(pulse\_duration \* 17150,2)

print("Distance:",distance,"cm"),

if distance>20:

{

GPIO.output(13,GPIO.HIGH),

GPIO.output(19,GPIO.LOW),

GPIO.output(23,GPIO.LOW),

print("Dustbin is empty")

}

time.sleep(5),

elif distance>7 and distance<20 :

{

GPIO.output(13,GPIO.LOW),

GPIO.output(19,GPIO.HIGH),

GPIO.output(23,GPIO.LOW)

}

time.sleep(5),

else:

{

GPIO.output(13,GPIO.LOW),

GPIO.output(19,GPIO.LOW),

GPIO.output(23,GPIO.HIGH),

print("Dustbin is full!!"),

client.messages.create(

from\_='+18157682441',

to='+919764907461',

body=' Your dustbin is full!!.....Please Clean it'),

print("message sent"),

time.sleep(30)

}

time.sleep(5),

GPIO.cleanup()

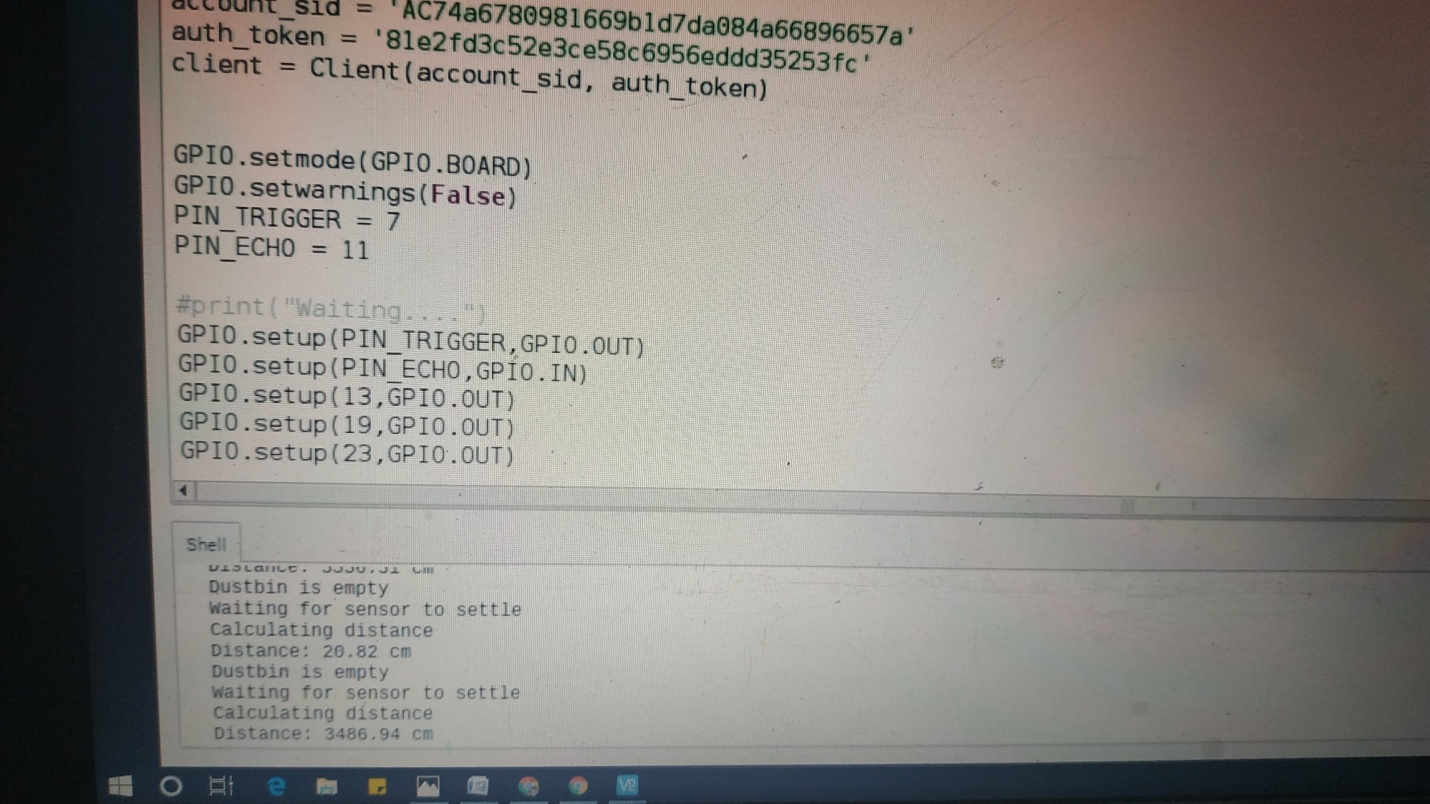
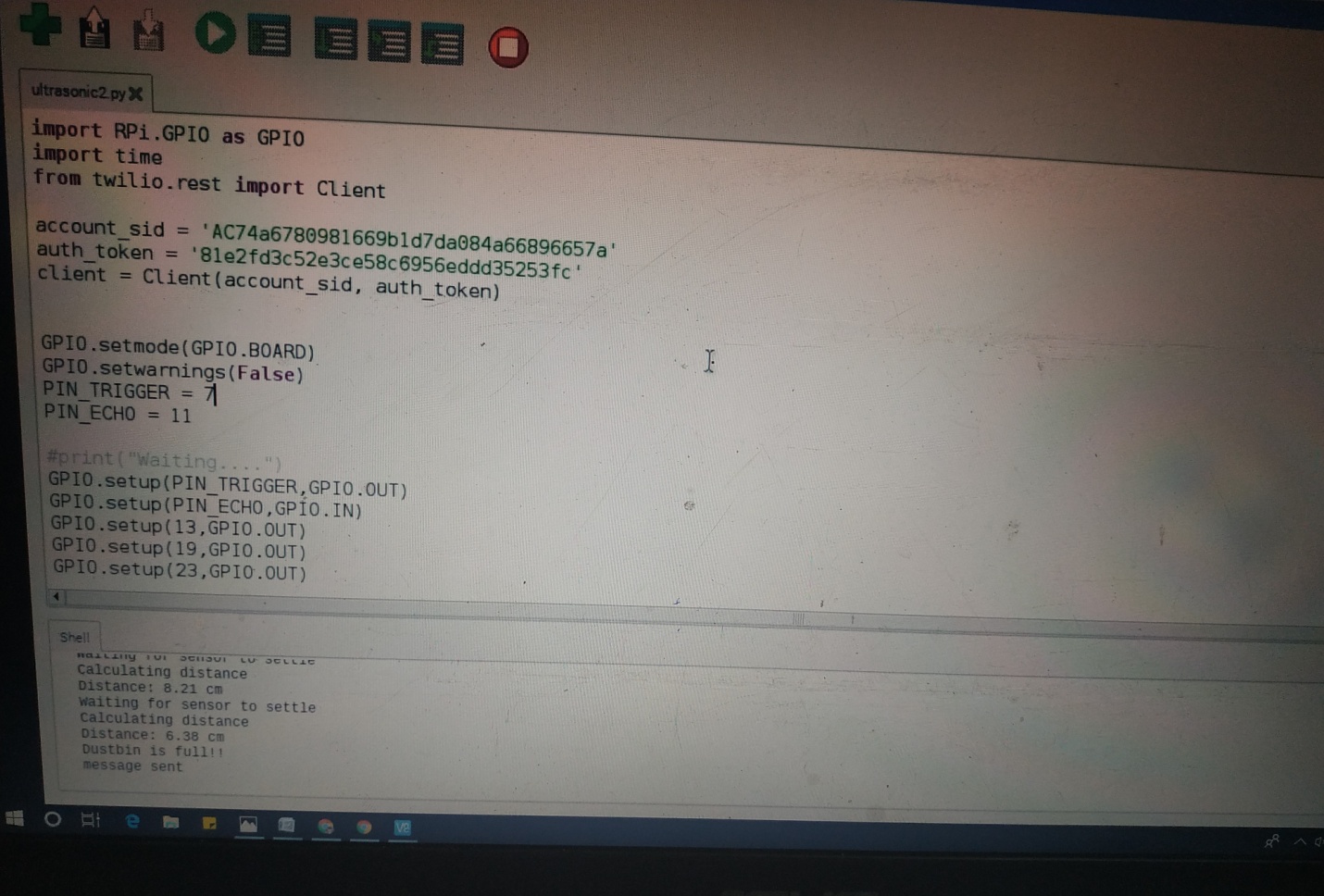
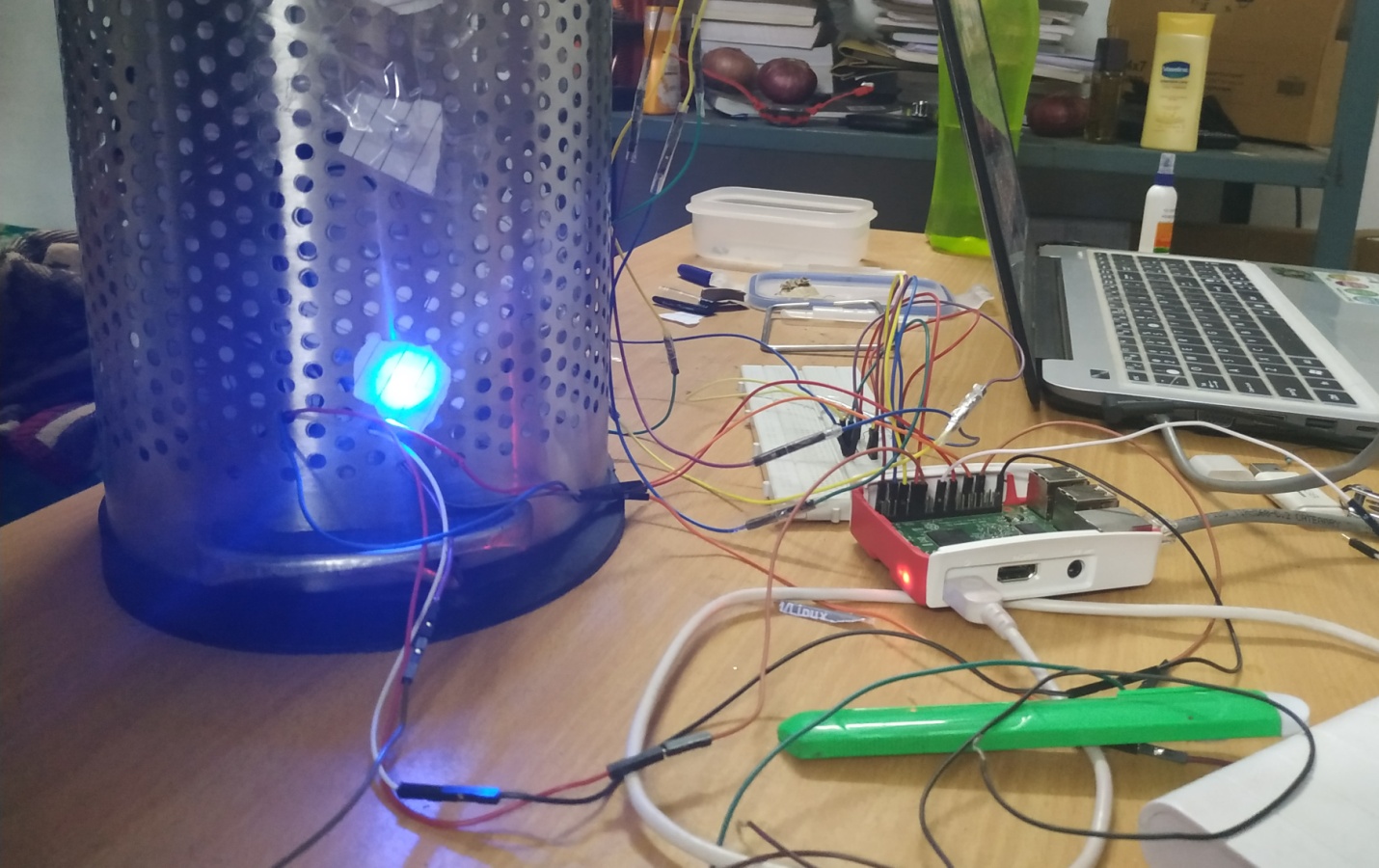
***pin diagram of GPIO***

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**Chapter 6**

***OUTPUT RESULT:***

The output of this project is fine hardware of smart Dustbin which is used for taking care of waste.

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