Name: Pritam Gotiram Mogal.
DIV:- TE (B)
Roll NO:-17
Sub:- ESIOT.

Experiment No. 07

Aim:- Write an application using Rasberry-Pi/Beagle board to control the operation of stepper motor.

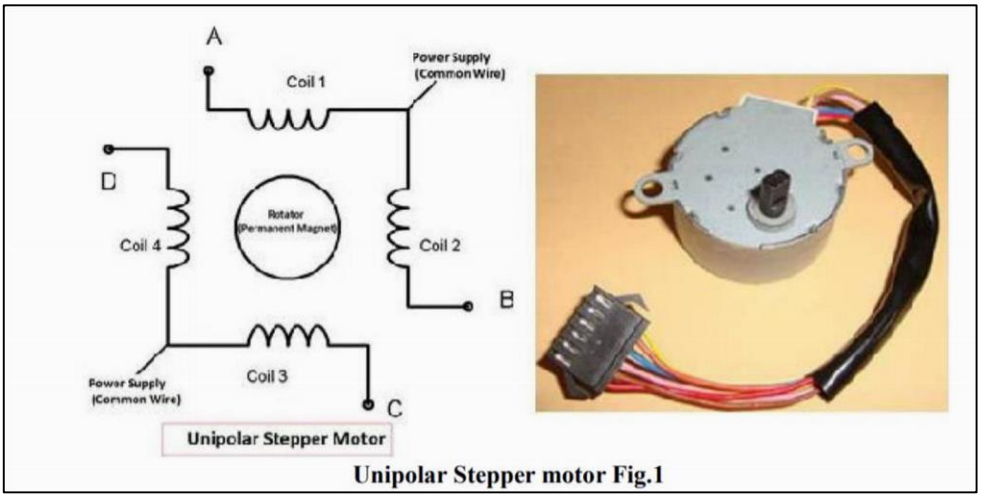
Theory:

Stepper motor:-

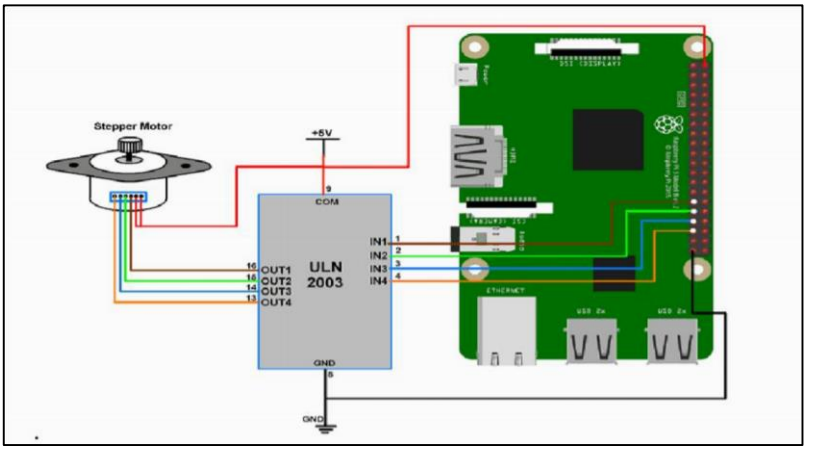
In steeper motor, as name itself says, rotation of shaft is an step form. There are different types of steaper motor, in here we will be using most popular one that is unipolar stepper motor unlike DC motor, we can rotate stepper motor to any particular angle by giving it proper instructions.

There are 40 GPIO o/p pins in Rasberry Pi2 but out of 40 only 26 GPIO pins can be programmed. Some of these pins perforns some special operation. with Specail GPIO put aside, we have only 17 GPIO remaining. Each of these 17 GPIO pin can deliever a maximum 15mA current. And sum of currents from all GPIS pins cannot exceed 50mA.

There are +5V power o/p pins on board for connecting other modules & sensors. These power rails cannot be used to drive the steppers motor, because we need more power to rotate it.



Unipolar Stepper motor Fig.1



Sample progeam :-
stepper motor interfacing with Raspberry Pi

```
import RPi.GPIO as GPIO
from time import sleep
import sys

# assign GPIO pins for motor
motor_Channel = (29,31,33,35)
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BOARD)
# for defining more than 1 GPIO channel as I/P use
GPIO.setup(motor_Channel, GPIO.OUT)

motor_dir = input('Select motor dir a = anticlockwise, c= clockwise :')
while True:
try:
if (motor_dir = 'c'):
print('motor running clockwise')
GPIO.output(motor_Channel, (GPIO.HIGH, GPIO.Low, GPIO.Low, GPIO High))
sleep(0.02)
GPIO.output(motor_Channel, (GPIO.HIGH, GPIO.HIGH, GPIO.Low, GPIO.Low))
sleepp(0.02)
GPIO.output(motor_Channel, (GPIO.low, GPIO.HIGH, GPIO.HIGH, GPIO.Low))
speep(0.02)
GPIO.output(motor_Channel, (GPIO.low, GPIO.Low, GPIO.HIGH, GPIO.HIGH))
sleep(0.02)

elif (motor_dir = 'a'):
print('motor running anti-clockwise')
```

```
GPIO.output(motor_channel,(GPIO.HIGH,GPIO.Low,GPIO.Low,GPIO.HIGH))
sleep(0.02)
GPIO.output(motor_channel,(GPIO.Low,GPIO.Low,GPIO.HIGH,GPIO.HIGH))
sleep(0.02)
GPIO.output(motor_channel,(GPIO.Low,GPIO.HIGH,GPIO.HIGH,GPIO.Low))
sleep(0.02)
GPIO.output(motor_channel,(GPIO.HIGH,GPIO.HIGH,GPIO.low,GPIO.Low))
sleep(0.02)

#press ctl
except KeyboardInterrupt:
motor_dir = input('select motor_dir a=anticlockwise, c=clockwise
                   or q=exit:')
if(motor_dir = 'q'):
print('motor stopped')
sys.exit(0)
```

Conclusion :-

Thus, we have studied implemented application of stepper motors using python with Raspberry Pi.