Practical no: 9

Title: Write an application Using Raspberry-pi/Begal board to control the operation of a hardware simulated lift elevator Lift Elevator Simulation using Raspberry pi board

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Practical 9

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Title :

Write an application using Raspberry-pi/ Begalboard tp control the operation of a hardware simulated lift elevator

Aim :

1. To understand working principal of Lift elevator.
2. To interface the Lift Elevator Module with Raspberry-Pi Model.
3. To program the Raspberry-Pi model to control operatio of Lift elevator module.

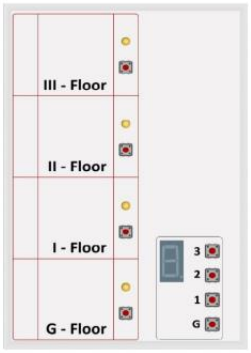
Software : Raspbian OS (IDLE)
Hardware : Raspberry Pi Board Module
Push buttons
Seven Segment Display
Led's
Monitor.

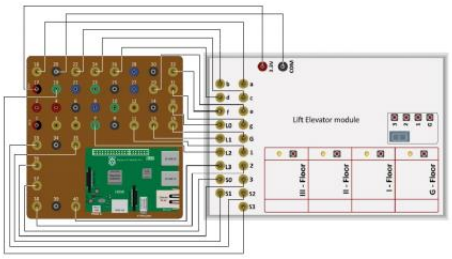
Theory

Lift Elevator Module has two parts:
1. Moving part inside the lift and
2. Stationary part outside the lift at each floor to call the lift.

Interface Dig:

Interface diagram:





Safety precautions:

1. First make all the connections as per given steps.
2. Power supply.

Steps for assembling circuit:

1. Connect all the pins of Lift Elevator module to pins of Raspberry Pi module as shown in figure.

Procedure:

1. Write the program as per algorithm.
2. Save the program.
3. Run code using Run Module.

Algorithm:

1. Import GPIO & time libraries.
2. Set GPIO mode as per board
3. Declare 4 push buttons pins of stationary part.
4. Declare four LED pins at each floor for detection of door close and open.
5. Declare four Push button pins of moving part.
6. Declare seven pins of seven segment display.
7. Set the push button pins as input.
8. Set the Seven segment Display pins & LED pins as output.
9. store the value of each digit of seven segment display in variables.
10. In the while loop, if "BUTTON-ONE" is pressed then lift at floor 1 and LED at floor 1 get ON for 5 second then goes OFF.
11. Person enters in the lift and presses the push button of any one floor in the moving lift.
12. The seven segment display displays the floor number of destination.

Observation

1. Observe the o/p on LEDs and Seven Segment Displays.

Code:

Conclusion:

Thus, we have studied Lift Elevator Simulation using Raspberry-Pi.

```
#Interfacing Lift Elevator module with Raspberry-Pi-3

import RPi.GPIO as GPIO
import time

FloorButton0 = 37
FloorButton1 = 35
FloorButton2 = 33
FloorButton3 = 19

 LiftButton0 = 15
 LiftButton1 = 11
 LiftButton2 = 38
 LiftButton3 = 36

#GPIO setup for the LEDs
 FloorLed0 = 16
 FloorLed1 = 13
 FloorLed2 = 7
 FloorLed3= 40

 #GPIO setup for the Seven Segment Display
 segAPin=18
 segBPin=22
segCPin=24
segDPin=26
segEPin=29
segFPin=32
segGPin=31


 GPIO.setmode(GPIO.BOARD)
 GPIO.setwarnings(False)


 GPIO.setup(FloorButton0,  GPIO.IN)
 GPIO.setup(FloorButton1,  GPIO.IN)
 GPIO.setup(FloorButton2,  GPIO.IN)
 GPIO.setup(FloorButton3, GPIO.IN)

 GPIO.setup(LiftButton0, GPIO.IN)
 GPIO.setup(LiftButton1,  GPIO.IN)
 GPIO.setup(LiftButton2,  GPIO.IN)
 GPIO.setup(LiftButton3. GPIO.IN)



 GPIO.setup(FloorLed0, GPIO.OUT) #Floor 1
GPIO.setup(FloorLed1, GPIO.OUT) #Floor 2
GPIO.setup(FloorLed2, GPIO.OUT) #Floor 3
GPIO.setup(FloorLed3, GPIO.OUT) #Floor 4



 GPIO.setup(segAPin, GPIO.OUT)
GPIO.setup(segBPin, GPIO.OUT)
GPIO.setup(segCPin, GPIO.OUT)
GPIO.setup(segDPin, GPIO.OUT)
GPIO.setup(segEPin, GPIO.OUT)
GPIO.setup(segFPin, GPIO.OUT)
GPIO.setup(segGPin, GPIO.OUT)

digitclr=[0,0,0,0,0,0,0]
digit0=[1,1,1,1,1,1,0]
digit1=[0,1,1,0,0,0,0]
digit2=[1,1,0,1,1,0,1]
digit3=[1,1,1,1,0,0,1]


gpin=[18,22,24,26,29,32,31]
#routine to clear and then write to display
def digdisp(digit):
for x in range (0,7):
GPIO.output(gpin[x], digitclr[x])

for x in range (0,7):
GPIO.output(gpin[x], digit[x])


while True:


if (GPIO.input(FloorButton0)== True) :
GPIO.output(FloorLed0,1)

print"0"

digdisp(digit0)
time.sleep(1)
GPIO.output(FloorLed0,0)
time.sleep(3)

while True:
if(GPIO.input(LiftButton1)== True):
print'floor ONE'
digdisp(digit0)
time.sleep(1)
digdisp(digit1)
time.sleep(2)
break
```

```
    elif (GPIO.input(LiftButton2)== True):

   print'floor TWO'
   digdisp(digit0)
   time.sleep(1)
   digdisp(digit1)
   time.sleep(1)
   digdisp(digit2)
   time.sleep(2)
   break


    elif (GPIO.input(LiftButton3)== True):

    print'floor THREE'
    digdisp(digit0)
   time.sleep(1)
   digdisp(digit1)
   time.sleep(1)
   digdisp(digit2)
   time.sleep(1)
   digdisp(digit3)
   time.sleep(2)

    break



    elif (GPIO.input(FloorButton1) == True):


    GPIO.output(FloorLed1, 1)
    print"1"

    digdisp(digit0)
   time.sleep(1)
   digdisp(digit1)
   time.sleep(1)
   time.sleep(4)

    GPIO.output(FloorLed1, 0)

   while True:
```

```
ES&IOTL
  if(GPIO.input(LiftButton0)== True):
  print 'floor ZERO'
 digdisp(digit0)
 time.sleep(2)
 break

 elif (GPIO.input(LiftButton2)== True):
 print'floor TWO'
  digdisp(digit2)
 time.sleep(2)
 break


 elif (GPIO.input(LiftButton3)== True):
print'floor THREE'
 digdisp(digit2)
time.sleep(1)
digdisp(digit3)
time.sleep(2)
break




 elif (GPIO.input(FloorButton2) == True):

 GPIO.output(FloorLed2, 1)

 print"2"

  digdisp(digit0)
time.sleep(1)
digdisp(digit1)
time.sleep(1)
digdisp(digit2)
time.sleep(1)
time.sleep(5)
GPIO.output(FloorLed2, 0)

 while True:
 if(GPIO.input(LiftButton0)== True):
 print 'floor ZERO'
digdisp(digit1)
time.sleep(1)
```

```
digdisp(digit0)
time.sleep(2)
break

 elif (GPIO.input(LiftButton1)== True):
print 'floor ONE'
 digdisp(digit1)
 time.sleep(2)
 break

 elif (GPIO.input(LiftButton3)== True):

 print'floor THREE'
 digdisp(digit3)
time.sleep(2)
break


 elif (GPIO.input(FloorButton3) == True):

 GPIO.output(FloorLed3, 1)

 print"3"
digdisp(digit0)
time.sleep(1)
digdisp(digit1)
time.sleep(1)
digdisp(digit2)
time.sleep(1)
digdisp(digit3)
time.sleep(6)

  GPIO.output(FloorLed3, 0)

  while True:
 if (GPIO.input(LiftButton0)== True):
print 'floor ZERO'
 digdisp(digit2)
time.sleep(1)
digdisp(digit1)
time.sleep(1)
digdisp(digit0)
 time.sleep(2)
 break

elif (GPIO.input(LiftButton1)== True):

 print 'Floor ONE'
digdisp(digit2)
time.sleep(1)
digdisp(digit1)
time.sleep(2)
break

 elif (GPIO.input(LiftButton2)== True):

 print'floor TWO'
digdisp(digit2)
 time.sleep(2)
 break



 else:
 ####      time.sleep(3)
digdisp(digit0)
 GPIO.output(FloorLed0, 0)
 GPIO.output(FloorLed1, 0)
GPIO.output(FloorLed2, 0)
GPIO.output(FloorLed3, 0)


 else:
 ####      time.sleep(3)
digdisp(digit0)
 GPIO.output(FloorLed1, 0)
 GPIO.output(FloorLed2, 0)
GPIO.output(FloorLed3, 0)
GPIO.output(FloorLed0, 0)
```