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1) Integrate LED sensor to raspberry pi (5 marks)

Project Link :

https://wokwi.com/arduino/projects/307728745473507908

MicroPython Program:

```
from machine import Pin
from utime import sleep

# Toggle LED , in every 0.5 sec
print("Integrating LED sensor in Raspberry pi Pico Simulator")

# Initialize the pin 9
led = Pin(9, Pin.OUT)

while True:  # Infinite loop
  led.toggle()  # ON OFF toggle function
  sleep(0.5)  # time between ON OFF
```

Line 1 ,2 :
Import the Pin class from the machine library, then import utime.
These library will communicate with GPIO

Line 5:
Print "Integrating LED sensor in Raspberry pi Pico Simulator"

Line 8:
led variable is used to control the ON OFF of LED sensor
Pin 9 is assigned to LED.

Line 10 to 12:
This will put an Infinite While loop and the LED is toggle between ON and OFF every 0.5 sec.

2) Integrate PIR Motion sensor to raspberry pi (5 marks)

Project link:

https://wokwi.com/arduino/projects/307726105654067776

MicroPython Program:

When ‘Stimulate Motion’ is pressed it means the Motion has occurred.

```
from machine import Pin
import utime

led = Pin(12, Pin.OUT)  # pin assigned
pir = Pin(8, Pin.IN, Pin.PULL_UP) # pin assigned

led.low()  # keep off
utime.sleep(3)  # pause time to process

while True:

   print(pir.value())  # print current value

   if pir.value() == 1:  # motion detected
      print("MOTION DETECTED")
      print("LED On")
      led.high()
      utime.sleep(5)
   else:  # no motion
      print("Waiting for movement")
      led.low()
      utime.sleep(2)
```

Line 1 , 2 :

Import the Pin class from the machine library, then import utime. These library will communicate with GPIO

Line 4:

led variable is used to control the ON OFF of LED sensor Pin 12 is assigned to LED it will turn ON when motion is Detected

Initially it is assigned as LOW i.e OFF

Line 5:

pir variable is used to control and provide the value when motion is detected Pin 08 is assigned to PIR motion sensor which will receive the input from sensor

For Better understanding we have assigned *value 0 as NO MOTION* and *value 1 as MOTION DETECTED*

Line 7,8:

Ensure the LED is low as put a wait of 3 sec to process so that any false trigger do not happen

Line 10,12:

This will put an infinite While loop and print the value of the pir sensor. The value will be 0 if no motion is detected and 1 if motion is detected

Line 14 to 18:

This will put a condition if the value is 1 i.e the motion is detected the LED will remain ON for 5 sec and print some message and wait for 5 sec to keep the LED ON .

Line 19 to 22:

Here the other condition is implemented that no detection is seen and the pir value is 0. Here it will wait for 2 sec and the loop continues.