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DESIGN AND IMPLEMENTAION OF CLOUD BASED LIGHT INTENSITY MONITORING SYSTEM USING RASPBERRY PI

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ABSTRACT
There are variety of applications for Light Meters for measuring and maintaining adequate light levels such as laboratories, hospitals, schools etc. To maintain healthier and safer environment adequate light levels in the workplace are necessary. Also during summer days, light intensity coming from sun light is too high which has to be controlled for avoiding overheating. This outcome in keeping up light power. Light force estimation should be possible utilizing distinctive sensors. Generally favoured sensors are LDR and photo diode. In the greater part of the applications estimation of light force is important to keep up required measure of light.

INDEX TERMS: Raspberry pi B+ model, HDMI cable, LDR circuit, GPIO

INTRODUCTION
A considerable lot of the enterprises are troubled with predetermined number of assets and genuine deficiency of specialists on their fields; real time remote checking presents a successful arrangement that limits their end eavors and consumptions to accomplish the craved outcomes inside time. This paper presents constant remote Light force observing framework utilizing Raspberry Pi which empowers the client to track the lighting framework remotely. Raspberry pi is a minimal effort ARM controlled Linux based PC which goes about as a server, and it speaks with customers with LAN or outside Wi-Fi module. The key element of this framework is light power being observed promptly and information put away in the database for sometime later, and appeared as dynamic diagrams to the client as per the client necessity in a terminal gadget like Tablet or Smart Phone or any web empowered gadget.
This enables specialists to settle on right choices at opportune time to get sought outcomes to guarantee wellbeing out and about, movement lights should be plainly obvious for street clients. The light force must be adequate under each (climate) condition, which set in legitimate principles. Throughout time, the iridescent force of activity lights gradually diminishes. Conceivable reasons are contamination of focal points or reflectors, maturing of the light source or individual LED failure. Remote observing empowers the street specialist to do opportune administrations, in a manner that activity lights keep satisfying the statutory guidelines for ideal movement wellbeing.

RELATED WORK
BLOCK DIAGRAM

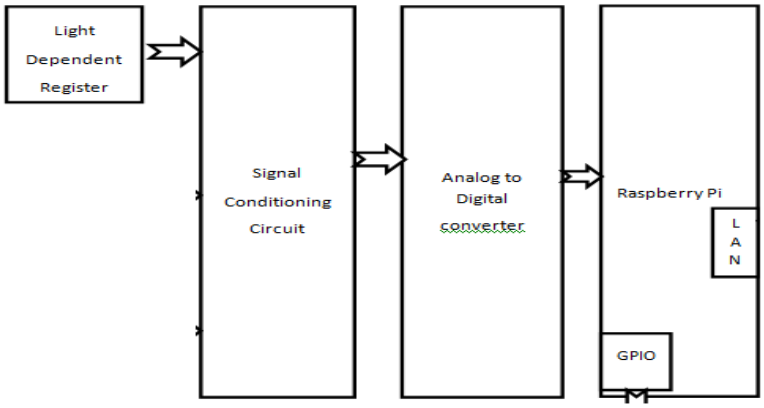

Figure 1: Block Diagram of system

PROCEDURE

1. Connect ADC circuit to LDR circuit and raspberry pi using cables.
2. Connect Raspberry pi to screen utilizing HDMI link.
3. Plug the power cable to raspberry pi to turn on device.
4. Subsequent to turning on raspberry pi the working framework will begin booting and it will appear on screen.
5. After complete the booting of raspberry pi we will get the initial desktop screen of Raspberry pi.
6. Open command window.
7. Type in command window 'sudosu'
8. Open drive where you store the program file. Using 'cd' command.
9. After opening drive write 'python file name.py' because the program should be done in python language we get '.py' extension for program file. Therefore run this file we first write python.
10. Then you'll see the readings which are from LDR. You can see the progressions of readings according to light power change.
11. For stop program execution press ctrl + z. The execution of program will stop.

RASPBERRY PI

The raspberry Pi board is connected to Humidity, Light measurement and control circuits. By gathering all data it uploads to Cloud based server from which the data is accessible to user via wireless internet connection to cloud from smart phone or tablet. We can store Acquire in the database, created web application put away in the server. Customer can get to the framework with IP address through PC or Smartphone or Tablet or whatever other web empowered gadget.

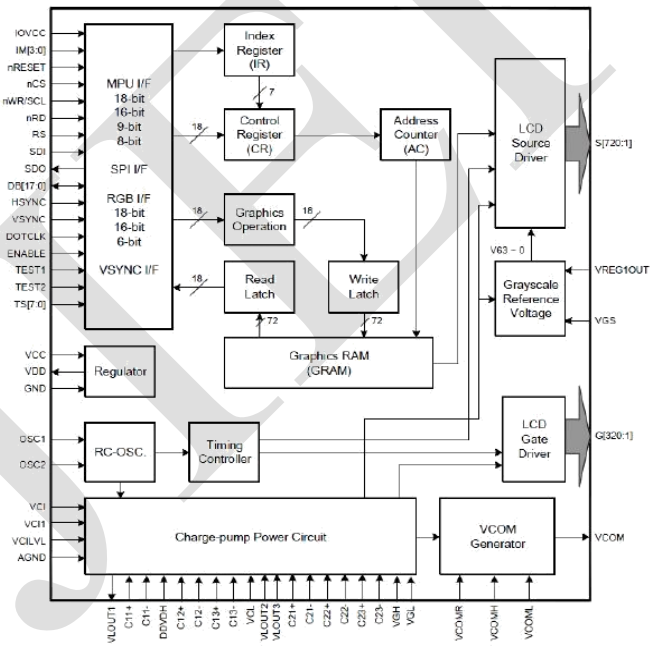

Fig: 2. Raspberry Pi Block Diagram

LIGHT SENSOR

Light Dependent Resistor (LDR) is utilized as light sensor. LDR is a resistor whose resistance diminishes with expanding occurrence light power. It is made of a high resistance semiconductor. In the event that light falling on the gadget is of sufficiently high recurrence, photons consumed by the semiconductor give bound electrons enough vitality to bounce into the conduction band. The subsequent free electron (and its gap accomplice) direct power, accordingly bringing down resistance.

SIGNAL CONDITIONING CIRCUIT

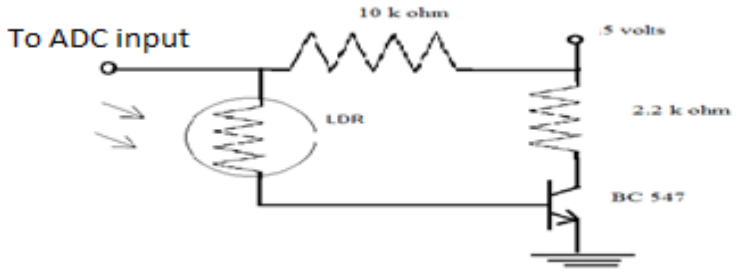

Figure 1 Signal conditioning circuit

SIGNAL CONDITIONING CIRCUIT SPECIFICATION:

Table 1 Component used in circuit

Component	Specifications
LDR	
Resistor	10 k ohm
Resistor	2.2 k ohm
Transistor	BC 547

The signal conditioning circuit block diagram as shown in figure 3. Depending on the sensor output the parameter of signal conditioning circuit change. The output of this circuit is sufficiently calibrated to be fed to ADC circuit

3. ANALOG TO DIGITAL CONVERTER

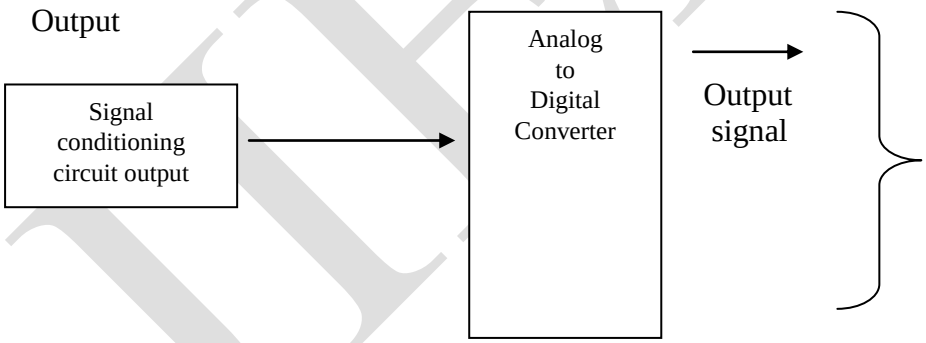

Figure 2 Proposed block diagram of Analog to Digital Converter

ADC circuit Specification: IC 3208
PIN function on table

Name	Function
VDD	+2.7V to 5.5V Power Supply
DGND	Digital Ground
AGND	Analog Ground
CH0-CH7	Analog Inputs
CLK	Serial Clock
DIN	Serial Data In
DOUT	Serial Data Out
CS/SHDN	Chip Select/Shutdown Input
VREF	Reference Voltage Input

The Analog to Digital converter block diagram as shown in figure 4. Raspberry Pi PC does not have an approach to peruse simple sources of info. It is a computerized just PC. Comparedto the PIC microcontrollers that often have 6 or more analog inputs. Simple information sources are convenient in light of the fact that numerous sensors are simple yields, so we require an approach to make the Pi simple cordial. We can do that by wiring up an outside ADC

INTERFACING CONNECTORS

GPIO

- General-reason input/yield (GPIO) is a non specific stick on an incorporated circuit whose conduct, including whether it is an information or yield stick, can be controlled by the client at run time.
- GPIO pins can be designed to be information or yield.
- GPIO pins can be empowered/incapacitated .
- Input qualities are decipherable (commonly high=1, low=0) .
- Output qualities are writable/comprehensible.
- Input qualities can regularly be utilized as IRQs (normally for wakeup occasions) .
- GPIO voltage levels are 3.3 V and are not 5 V tolerant.

HDMI CABLE:

A HDMI-or composite video-fit TV or screen.

A HDMI-able screen since it offers better determination and inherent sound. You can utilize simple in the event that you need, be that as it may. A HDMI link to interface Raspberry Pi to screen.

RESULTS:

As per above methodology experiment conducted and got following results

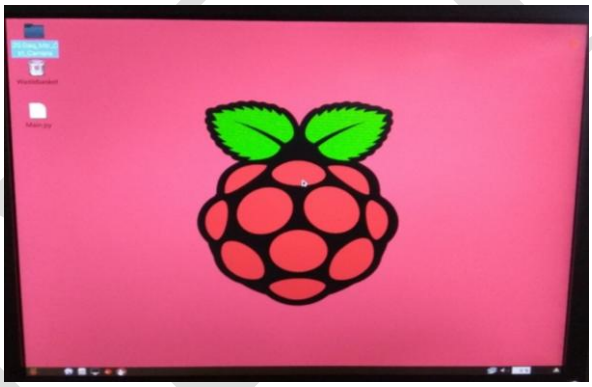

Figure 5 Initial display of Raspberry Pi

Above figure shows the first screen after starting Raspberry Pi project.

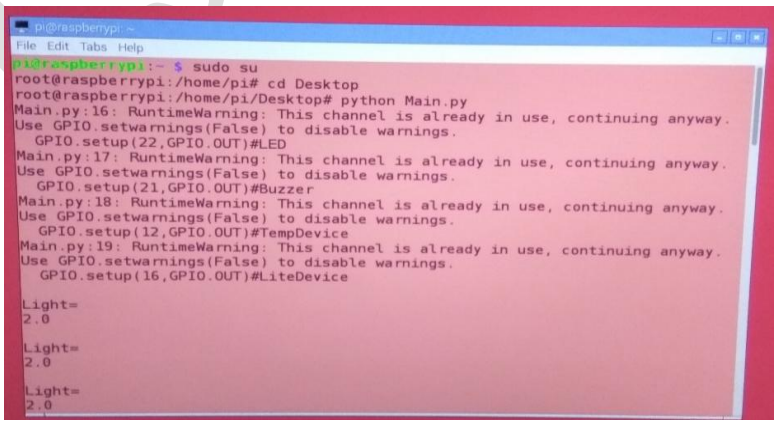

Figure 6 Project command window

Above figure shows light sensor program run in command window.

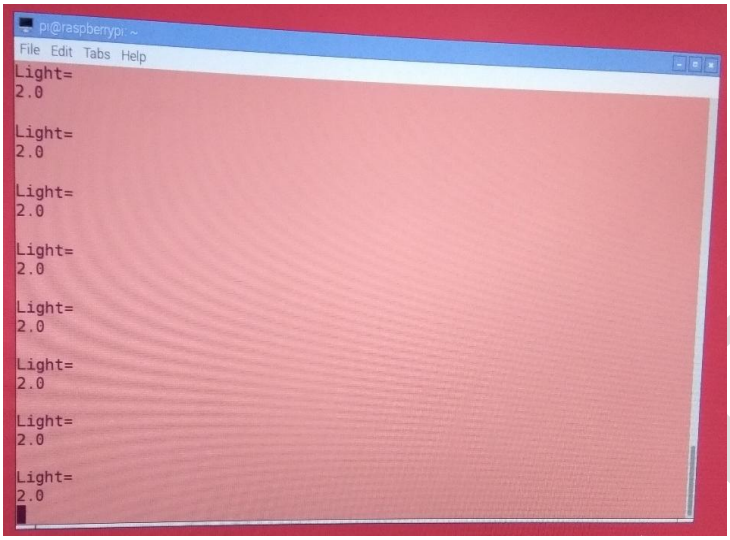

Figure 7 Reading before light projecting on LDR

As see in above these are readings before light projecting on LDR.

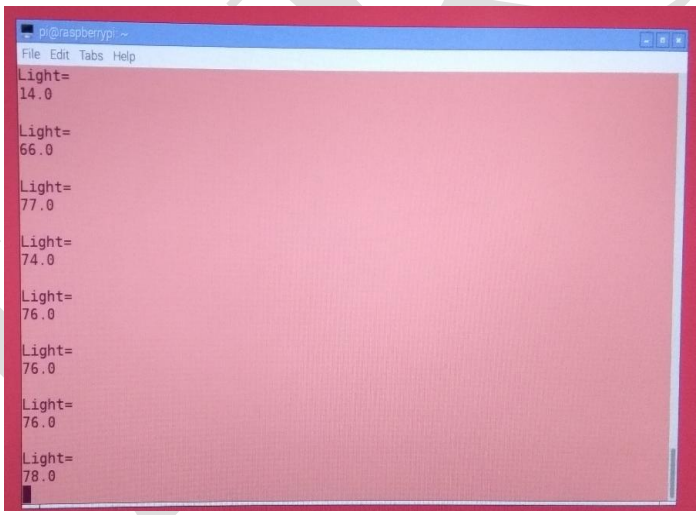

Figure 8 Readings after light projecting light on LDR

Above figure shows the resistance of LDR changes after light projection.

Table 2. Reading of light intensity after projection light

Reading no.	Light intensity (lux)	Light distance from LDR (cm)
1	2.0	Initial
2	14.0	1.5
3	66.0	1
4	78.0	0.5

CONCLUSION

According to the outcome it demonstrates that LDR is a resistor whose resistance diminishes with expanding episode light power. The readings of LDR showed effectively on Raspberry Pi.

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