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Experiment No. - 3

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Aim: Study of connectivity and configuration of Rasberry-Pi / Beagle board with basic peripherals LED's Understanding GPIO and its use in program.

Theory:
Connectivity and Configuration of Raspberry -Pi Guides to Configure Raspberry Pi

1. raspi-config: The Raspberry Pi Configuration tool (rasp-config) in Raspbian allowing you to access and easily enable features such as the camera and to change your specific setting.

2. Config.txt: Raspberry Pi configuration file

3. Wireless: Configuring your Pi to connect to a wireless network using the Raspberry Pi 3 & Pi zero W's in built wireless connectivity or a USB wireless dongle.

4. Wireless Access Point: Configuring your Raspberry Pi-3 as a wireless access point using the Rasberry Pi 3 and Pi zero W's In built wireless connectivity or a USB wireless dongle

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5. Audio Config : Switch your audio o/p between HDMI and 3.5mm jack.

6. Camera Config : Installating and setting up the Rasberry Pi camera board.

7. External Storage Config : Mounting and Setting up external storage on a RasperryPi

8. Localisation : Setting up your Pi to work in your local language / time Zone

9. Default Pin Configuration : 8. changing the default pin states.

10. Device trees confi - Device trees overlays & parameters.

11 Kernal Command Line : The Linux kernel accepts a command line of parameters during boot. This command line is defined in a file in the boot partition called cmdline.txt. It can be edited using any text edditer Sudo nano /boot/ cmdline.txt

12 UART Configuration : the SoCs used on the Rasberry Pis have two built in UARTs a PL011 and a mini UART They are implemented using different h/w blocks so they have slightly different characteristics Both

are 3.3v devices so extra care must be taken while connecting RS 232 or other system that utilize different voltage levels between protocals.

13. Screen Saver : If using Raspberry pie solely on the console (no desktop GUI) you need to set the console blanking. The current setting can be displayed using
cat /sys/module/kernal/parameters/console blank
To set permanatly on the kernal cmd line
Sudo nano /boot/cmdline.txt.

Connectivity of Raspberry Pi
Connectivity is truly superb for tiny device. There are two 2.0 ports that can be used to hook up peripherals or adapters and this can be used can be expanded with powered hub All the ports are found on the top of the board, while the SD card reader is located at the bottom.

GPO Mode:
The GPO.O.Board option specifies that you are referring to the pins by the numbers of the pin the plug - i.e the numbers are printed on the board (e.g P1) and the middle of the diagrams below the GPIOBCN option means that you are referring to the pins by the "Broadcom SOC channel".

number these are the numbers after GPIO
The Model B+ Pi zero Pi 2B & Pi 3B
uses the name numbering as the Model B+
and add's new pins (board numbers) 27-40

Building a Circuit
To set ping write:
GPIO.setup (23, GPIO.In); Pull-up-down
= GPIO.PUD_Power
GPIO.Setup (24, GPIO.In pull-up-down = GPIO
.PUD_UP)

The code looks like
import RPi.GPIO as GPIO
GPIO.setmode(GPIO.BCM)
GPIO.setup(23.GPIO.IN, Pull-up-down
= GPIO.PUD_Down)
GPIO.Setup(24.GPIO.IN, Pull-up-down
= GPIO.PUD_UP)
while True:
If (GPIO.input(23)==1):
print("Button 1 Pressed")
if (GPIO.input(24)==0):
print("Button 2 Pressed")
GPIO.cleanup()

Registers: Always use resistors to connect LED's up to GPIO pins. Putting resisters in circuit will ensure that small current (about 6mA) will flow & Pi will not be damaged.

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Jumper Wires: Used on board boards to 'Jump' from on connection to another
- Ones you will be using in this circuit have different connector on each end.
- The end with the 'Pin' will go into bread board
- The end with the piece of plastic with a hole in it will go on to on to the Pis GPIO pins.

Conclusion

Thus we have studied connectivity and configuration of Rasberry Pi and also use of GPIO.