Experiment NO - 3.

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Aim - Study of connectivity and configuration of Raspberry - Pi / Beagle board with basic peripherals. , LED's, understanding GPIO and its use in program.

Theory :

Connectivity and Configuration of RaspberryPi

Guides to Configure Raspberry Pi

1) raspi - config - The Raspberry Pi configuration tools (ras-config) in Raspbian, allowing you to access and easily enables features such as the camera, and to change your specific settings.

2. Config.txt - Raspberry Pi Configurations file.

3. Wireless : Configuring your pi to connect to a wireless network using the Raspberry Pi 3 & Pi zero Ws in built wireless connectivity, or a USB wireless Dongle.

4. Wireless Access Point - Configuration your Raspberry Pi as a wireless access point. Using the Raspberry Pi3 and Pi zero. W's In built wireless connectivity or, a USB wireless dangle.

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

6. Camera Config : Installing and setting up the Raspberry Pi, camera board.

7. External Storage Config : Mounting and Setting up External Storage on a Raspberrypi.

8. Localisation - Setting up your Pi to work in your local language / time zone.

9. Default Pin configuration : Changing the Default pin States.

10. Device trees Config : Device tree, Overlays & parameters.

11. Kernel Command line : The linux kernel accepts a command line of parameter during boot. This command line is

defined in a file in the boot partition, called cmdline.txt. It can be edited using any text editor sodo nanol boot/cmd line.txt.

12. UART configuration : The SOC's used on the Raspberry Pi is have two built-in. UARTs, a PL011 and a mini UART. They are implemented using different hlw blocks. So they slightly differents characteristics. Both are 3.3v devices, so extra care must be taken while connecting RS232 or other system that utilizes different voltage levels between protocol.

13 Screensaver: If using RaspberryPi solely on the console(no desktop GUI), you need to set the console blanking. The current setting can be displayed using cat/sys /module/kernel/parameters/control/blanks.

The set permanently on the kernel cmd line sudo nano /boot/cmdline.txt.

Connectivity of Raspberry Pi

Connectivity is truely superb for tiny device. There are two 2.0 ports that can be

that can be used to hook up peripheral or adapters, and this can be expanded with powered hub. All the ports are found the top of the board. while the SD card reader is located at the bottom

GPO model :

The GPIO.BOARD option specifies that you are refering to the pins by the number of the pin the plug. i.e the number printed on the board and in the middle of the digram below. The GPIO BCN option, means that you are referring to the pins by the "Broadcom SoC Channel" number, these are number after GPIO.

Building a circuit :

To set pins write :

GPIO.setup (23, GPIO.IN, Poll-up-down = GPIO.POP.pow GPIO.setup (24, GPIO.IN, pull-up-down = GPIo.PuD-up).

The Code looks like :

```
import PRi.GPIO as GPIO.
GpIO.setmode (GPIo.BCN).

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 resistors in circuit with ensure that only small current (about 60mA) will flow2 pi will not be damaged.

Jumper wires : used on breadboard to" jump" from one connection to another.
- onces you will be using in this circuit
- circuit have different connector on each end.
- The end with the 'pin' will go into bread board.

Conclusion → Thus, we have studied connectivity and configuration of Raspberry pi and also use of GPIO.