# Assignment Number – 3

**Title:** Connectivity and configuration of Raspberry

**Problem Definition:** Study of Connectivity and configuration of RaspberryPi /Beagle board circuit with basic peripherals, LEDS. Understanding GPIO and its use in program.

## Objectives:

➔ To understand configuration of Raspberry-pi/Beagle board circuit with basic peripherals and its use in the program.

## Outcomes:

Students will be able to:
➔ Connectivity of Raspberry-pi and Implement the program

## Software and Hardware Requirements:
Raspberry-pi/ Beagle board
PC with the configuration as Latest Version of 64 bit Operating Systems,Open Source Fedora-GHz. 8 G.B. RAM, 500 G.B. HDD, 15"Color Monitor, Keyboard, Mouse

## Theory:

## raspi-config :

The Raspberry Pi configuration tool in Raspbian, allows you to easily enable features such as the camera, and to change your specific settings such as keyboard layout.

Moving around the menu Use the up and down arrow keys to move the highlighted selection between the options available. Pressing the right arrow key will jump out of the Options menu and take you to the <Select> and <Finish> Buttons. Pressing left will take you back to the options. Alternatively, you can use the Tab key to switch between these.

## Change User Password

The default user on Raspbian is pi with the password raspberry. You can change that here. Read about other users.

## Network Options

From this submenu you can set the host name, your WiFi SSID, and pre-shared key, or enable/disable predictable network interface names.

## Hostname

Set the visible name for this Pi on a network. Boot Options From here you can change what happens when your Pi boots. Use this option to change your boot preference to command line or desktop. You can choose whether boot-up waits for the network to be available, and whether the Plymouth splash screen is displayed at boot-up.

## Localisation Options

The localisation submenu gives you these options to choose from: keyboard layout, time zone, locale, and WiFi country code. All options on these menus default to British or GB until you change them.

### Change locale

Select a locale, for example en_GB.UTF-8 UTF-8.

### Change time zone

Select your local time zone, starting with the region, e.g. Europe, then selecting a city, e.g. London. Type a letter to skip down the list to that point in the alphabet.

### Change keyboard layout

This option opens another menu which allows you to select your keyboard layout. It will take a long time to display while it reads all the keyboard types. Changes usually take effect immediately, but may require a reboot.

### Change WiFi Country

This option sets the country code for your WiFi network.

### Interfacing Options

In this submenu there are the following options to enable/disable: Camera, SSH, VNC, SPI, I2C, Serial, 1-wire, and Remote GPIO.

### Camera

Enable/disable the CSI camera interface.

### SSH

Enable/disable remote command line access to your Pi using SSH

**VNC**

Enable/disable the RealVNC virtual network computing server.

**SPI**

Enable/disable SPI interfaces and automatic loading of the SPI kernel module, needed for products such as PiFace.

**I2C**

Enable/disable I2C interfaces and automatic loading of the I2C kernel module.

**Serial**

Enable/disable shell and kernel messages on the serial connection.

**LED Blinking using Raspberry PI**

LED blinking is one of the beginner circuit which helps one to get acquainted with GPIO pins of Raspberry Pi. Here we require 1 LED, 100ohm resistor and jumper cables. For the GPIO, output voltage is 3.3V maximum out current is 16mA per pin. For controlling an LED with Raspberry Pi both Python and GPIO library is needed. No need to install as these are preinstalled on Raspbian OS.

**Python Program**

1. Open terminal.
2. Launch IDLE by typing sudo idle
3. After THE idle launches open a new window by File> Open.

4. Type the code in the window.

```
import time
import Rpi.GPIO as GPIO
GPIO.setmode( GPIO.BOARD)
GPIO.setup( 11, GPIO.out )
while True :
    GPI.output(11,True)
    time.sleep(1)
    GPI.output(11,False)
    time.sleep(1)
```
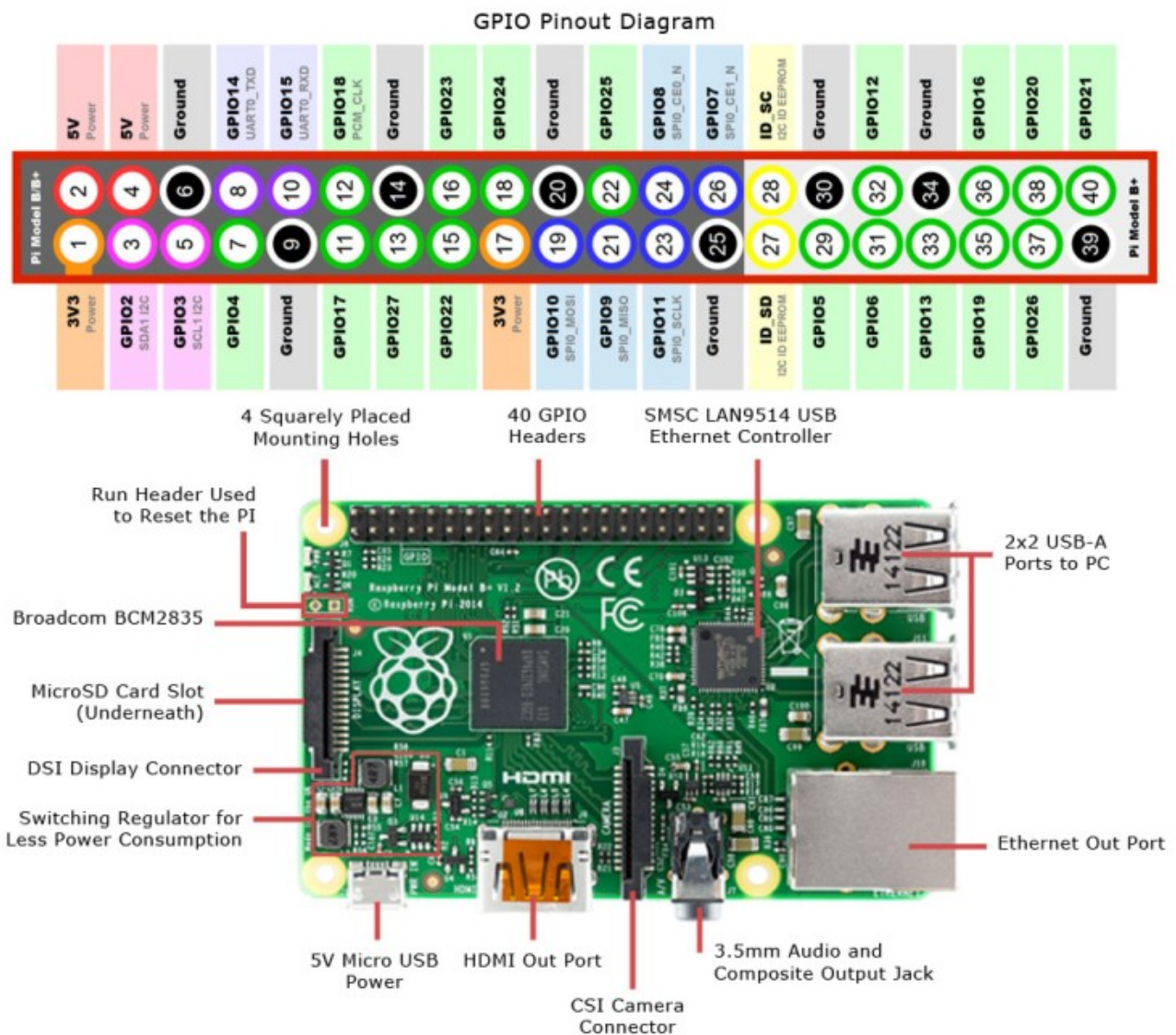
5. Save and run the code
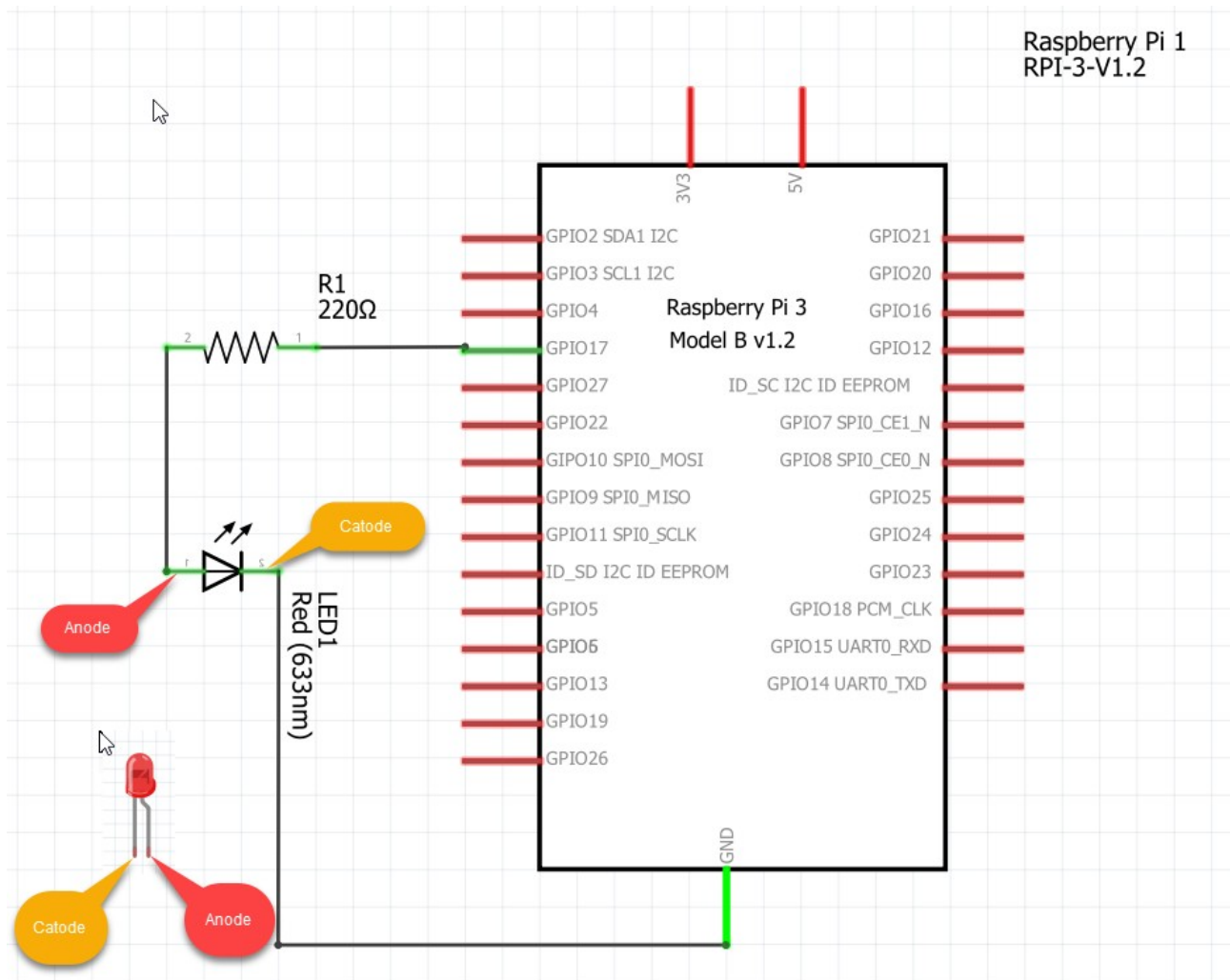


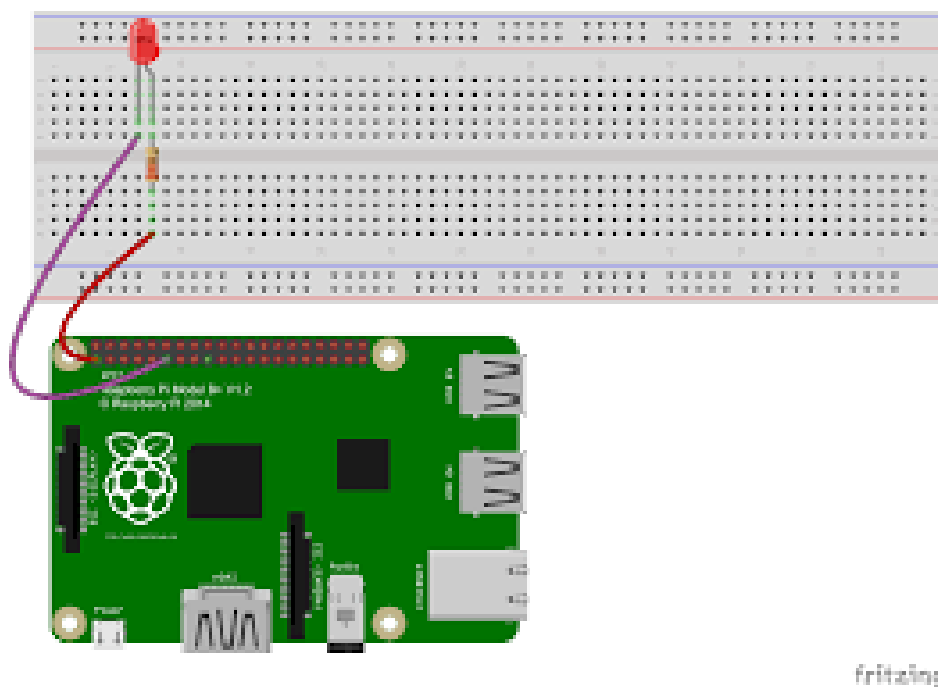Fig. Raspeberry Pi GPIO

Fig. Raspeberry Pi LED connections



Fig. Raspeberry Pi LED connections

**Conclusion :**

We have successfully configured the Raspberry Pi board and performed the simple experiment to blink an LED by making appropriate circuit connections using the GPIO pins.