

Assignment A3

Q.1] Explain & list GPIO Pins with their functions

→ 3.3 V DC Power	①	②	DC Power 5V
GPIO 02 (SDA1, I2C)	③	④	DC Power 5V
GPIO 03 (SCL1, I2C)	⑤	⑥	GROUND
GPIO 04 (GPIO, CLK)	⑦	⑧	(I2C) GPIO 14
GROUND	⑨	⑩	(I2C) GPIO 15
GPIO 17 (GPIO-GEN0)	⑪	⑫	GPIO-GEN1
GPIO 27 (GPIO-GEN2)	⑬	⑭	GROUND
GPIO 22 (GPIO-GEN3)	⑮	⑯	(GPIO GEN4) GPIO 23
3.3 V DC Power	⑰	⑱	(GPIO GEN5) GPIO 24
GPIO 10 (SPI-MOSD)	⑲	⑳	GROUND
GPIO 09 (SPI-MISO)	㉑	㉒	(GPIO GEN5) GPIO 25
GPIO 11 (SPI-CLK)	㉓	㉔	(GPIO-CE0N) GPIO 28
GROUND	㉕	㉖	(SPI-CE1N) GPIO 07
ID-SD (I2C)	㉗	㉘	ID-SC
GPIO 05	㉙	㉚	GROUND
GPIO 06	㉛	㉜	GPIO 12
GPIO 13	㉝	㉞	GROUND
GPIO 19	㉟	㊱	GPIO 16
GPIO 26	㊲	㊳	GPIO 20
GROUND	㊴	㊵	GPIO 21

- i) Pin No's → 01, 02, 04, 17 → V_{CC}.
- ii) Pin No's → 09, 06, 14, 20, 25, 30, 34, 39 → GROUND
- iii) SDA & SCL → Permits Synchronous Data Transfer.
- iv) MISO (Master In Slave Out) → Master line Working Sending Data
- v) MOSI (Master Out Slave In) → Slave line working Sending Data
- vi) SCK (Serial Clock) → Clocks Signals by master for Synchronous Data Transfer.

- vii) CE0 (Chip Enable 0) → To enable or disable Device.
- viii) CE1 (Chip Enable 1) → To enable or Disable Device.
- ix) I2C (Inter Integrated Circuit) → Connects H/w Device.
- x) TXD, RXD → Used for Serial communication.

Q-2 Explain terms SPI, I2C & UART Interfaces.

- i) SPI provides synchronous serial data transfer with one or more peripheral device connected.
- ii) In SPI connection, there is usually one master device and one or more slave device.
- iii) SPI uses five pins to provide such connection.
- a) MISO d) SCK
 - b) MOSI e) CEI
 - c) CE0

I2C (Inter Integrated Circuit)

- i) I2C provides a way to connect the hardware device to Raspberry Pi Module.
- ii) I2C permits Synchronous Data Transfer with 2 Pins. One clock (SCL) & other for data (SDA).

UART.

- i) The UART uses Std. non return to zero for consisting of one start bit, eight or nine data bits, one or two stop bits.
- ii) To increase the data transmission, noise immunity parity is supported by hardware.
- iii) The UART may be configured by the user as even odd or no parity.

3) Write a program to Interface both Buzzer & LED with RPi.

→ `import RPi.GPIO as GPIO.`

`GPIO.setmode(GPIO.Board)`

`GPIO.setup(13, GPIO.out)`

`GPIO.setup(18, GPIO.out)`

`while (true):`

`GPIO.output(13, true)`

`GPIO.output(18, true)`

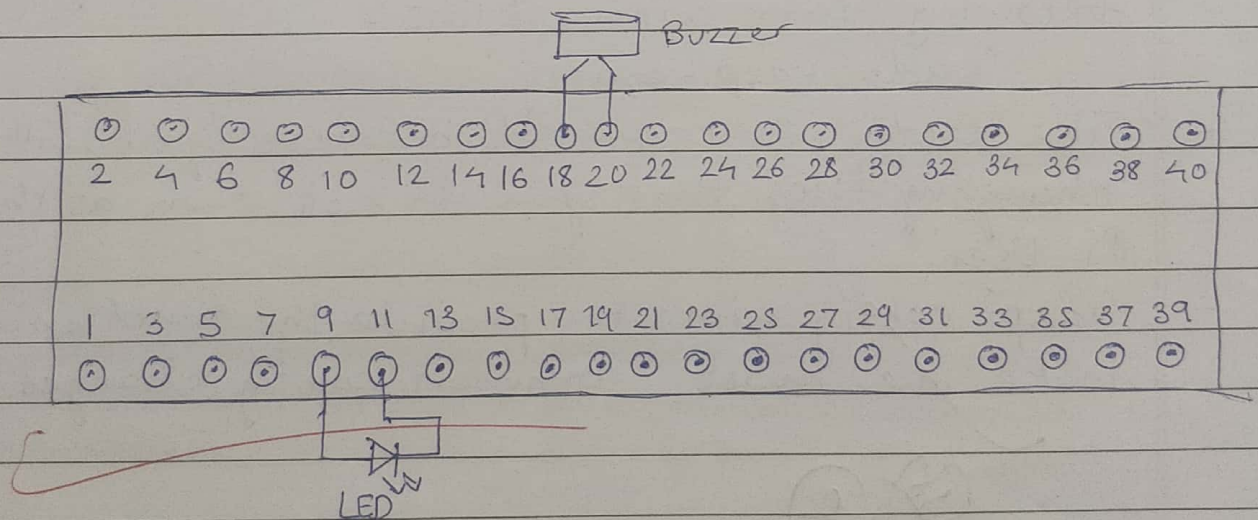
`time.sleep(1)`

`GPIO.output(13, false)`

`GPIO.output(18, false)`

`time.sleep(1)`

4) Draw neat ckt. diagram for connections used for assignment



5) Discuss Raspi-config for configuration of Raspberry-Pi

→ Raspi-config → The Raspberry Pi config tool in raspbian allowing you to easily enable features

such as the camera & to change your specific setting such as keyboard layout.

Config Text → Raspberry Pi configuration file.

Wireless:

- ① Configuring your Pi to connect to a wireless network using Raspberry Pi 3 and zero inbuilt wire connectivity or a USB wireless dongle.
- ② Raspi-config is the Raspberry Pi configuration tool & maintained by Alex Broadbent. It targets Raspbian

Usage:

- You will be shown 'raspi-config' on first into raspbian to open the config tool, after this simply run the following from command line:
 'sudo raspi-config'
- The 'sudo' is required because you will be changing files that you do not own as the Pi User.
- raspi config aims to provide the functionality to make the most common config changes.

~~©~~