GPIO Output (LED Blink)

```python
import RPi.GPIO as GPIO
import time

LED_PIN = 17
GPIO.setmode(GPIO.BCM)
GPIO.setup(LED_PIN, GPIO.OUT)

while True:
    GPIO.output(LED_PIN, GPIO.HIGH)
    time.sleep(1)
    GPIO.output(LED_PIN, GPIO.LOW)
    time.sleep(1)
```

GPIO Input (Button Press)

```python
import RPi.GPIO as GPIO

BUTTON_PIN = 18
GPIO.setmode(GPIO.BCM)
GPIO.setup(BUTTON_PIN, GPIO.IN, pull_up_down=GPIO.PUD_UP)

while True:
    if GPIO.input(BUTTON_PIN) == GPIO.LOW:
        print("Button Pressed")
```

PWM Signal Generation

```python
import RPi.GPIO as GPIO
import time

PWM_PIN = 12
GPIO.setmode(GPIO.BCM)
GPIO.setup(PWM_PIN, GPIO.OUT)

pwm = GPIO.PWM(PWM_PIN, 1000)
pwm.start(50)

time.sleep(5)
pwm.stop()
GPIO.cleanup()
```

SPI Communication (spidev)

```python
import spidev

spi = spidev.SpiDev()
spi.open(0, 0)
spi.max_speed_hz = 50000
```

```
to_send = [0x01, 0x02]
received = spi.xfer(to_send)

print(received)
spi.close()
```

UART Communication (serial)

```
import serial

ser = serial.Serial('/dev/serial0', 9600)
ser.write(b'Hello from Raspberry Pi\n')

while True:
    if ser.in_waiting:
        print(ser.readline().decode('utf-8'))
```

I2C Communication (smbus)

```
import smbus

bus = smbus.SMBus(1)
address = 0x48

bus.write_byte(address, 0x01)
value = bus.read_byte(address)

print("Received:", value)
```

GPIO Interrupt (Edge Detection)

```
import RPi.GPIO as GPIO

def button_callback(channel):
    print("Button was pushed!")

BUTTON_PIN = 23
GPIO.setmode(GPIO.BCM)
GPIO.setup(BUTTON_PIN, GPIO.IN, pull_up_down=GPIO.PUD_UP)
GPIO.add_event_detect(BUTTON_PIN,         GPIO.FALLING,         callback=button_callback,
bouncetime=300)

message = input("Press Enter to quit\n")
GPIO.cleanup()
```