

## Interacting with GPIO from MicroBlaze

```
In [3]: from pynq.overlay.base import BaseOverlay
import time
from datetime import datetime
base = BaseOverlay("base.bit")
```

```
In [4]: %%microblaze base.PMODB

#include "gpio.h"
#include "pyprintf.h"

//Function to turn on/off a selected pin of PMODB
void write_gpio(unsigned int pin, unsigned int val){
    if (val > 1){
        pyprintf("pin value must be 0 or 1");
    }
    gpio pin_out = gpio_open(pin);
    gpio_set_direction(pin_out, GPIO_OUT);
    gpio_write(pin_out, val);
}

//Function to read the value of a selected pin of PMODB
unsigned int read_gpio(unsigned int pin){
    gpio pin_in = gpio_open(pin);
    gpio_set_direction(pin_in, GPIO_IN);
    return gpio_read(pin_in);
}
```

```
In [5]: write_gpio(0, 2)
read_gpio(1)

pin value must be 0 or 1
```

```
Out[5]: 1
```

## Multi-tasking with MicroBlaze

```
In [4]: base = BaseOverlay("base.bit")
```

In [5]: %%microblaze base.PMODA

```
#include "gpio.h"
#include "pyprintf.h"

//Function to turn on/off a selected pin of PMODA
void write_gpio(unsigned int pin, unsigned int val){
    if (val > 1){
        pyprintf("pin value must be 0 or 1");
    }
    gpio pin_out = gpio_open(pin);
    gpio_set_direction(pin_out, GPIO_OUT);
    gpio_write(pin_out, val);
}

//Function to read the value of a selected pin of PMODA
unsigned int read_gpio(unsigned int pin){
    gpio pin_in = gpio_open(pin);
    gpio_set_direction(pin_in, GPIO_IN);
    return gpio_read(pin_in);
}

//Multitasking the microblaze for a simple function
int add(int a, int b){
    return a + b;
}
```

In [6]: val = 1  
write\_gpio(0, val)  
read\_gpio(1)

Out[6]: 1

In [7]: add(2, 30)

Out[7]: 32

## Lab work

Use the code from the second cell as a template and write a code to use two pins (0 and 1) for send and two pins (2 and 3) for receive. You should be able to send 2bits (0~3) over GPIO. You'll need to hardwire from the send pins to the receive pins.

In [7]: %%microblaze base.PMODB

```
#include "gpio.h"
#include "pyprintf.h"

//Function to turn on/off a selected pin of PMODB
void write_gpio(unsigned int pin, unsigned int val){
    if (val > 1){
        pyprintf("pin value must be 0 or 1");
    }
    gpio pin_out = gpio_open(pin);
    gpio_set_direction(pin_out, GPIO_OUT);
    gpio_write(pin_out, val);
}

//Function to read the value of a selected pin of PMODB
unsigned int read_gpio(unsigned int pin){
    gpio pin_in = gpio_open(pin);
    gpio_set_direction(pin_in, GPIO_IN);
    return gpio_read(pin_in);
}

//Multitasking the microblaze for a simple function
int add(int a, int b){
    return a + b;
}
```

In [10]: val0 = 1

```
val1 = 0
write_gpio(0, val0)
write_gpio(1, val1)
print(read_gpio(2))
print(read_gpio(3))
```

```
1
0
```

In [ ]: