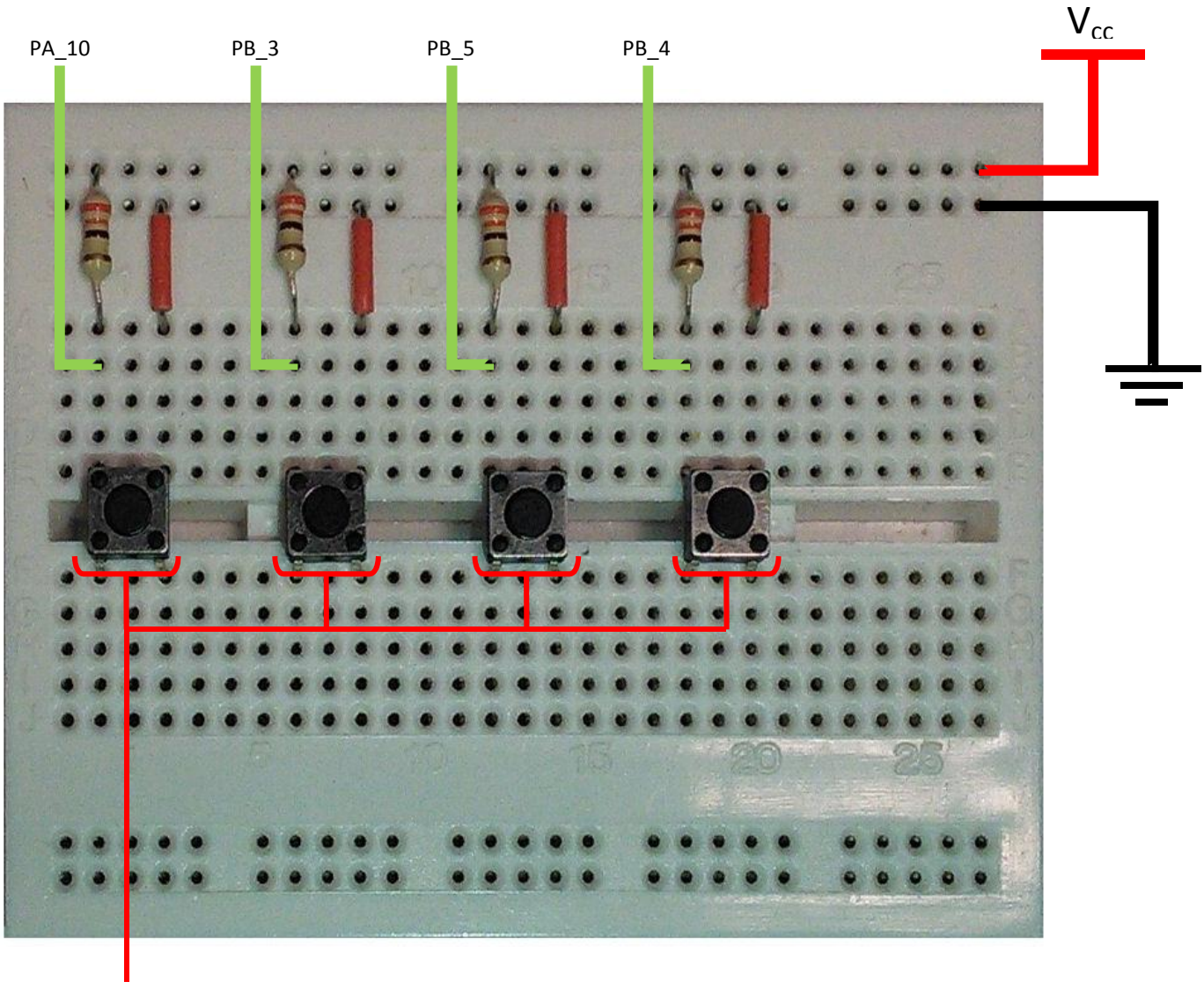
# LAB EXERCISE:
# PROGRAMMING USING MBED API

## OVERVIEW

In this lab, you will learn how to use the mbed SDK library to program two applications, the first replicates the previous module's lab exercise using the mbed API, this time, and the second writes an interrupt handler with the mbed API:



- Exercise 1: Interface the GPIOs using digital IO functions in the mbed API
- Exercise 2: Implement the interrupt handler using the interrupt libraries in the mbed API

# IMPLEMENTATION DETAILS

## SOFTWARE FUNCTIONS

### DIGITAL IN/OUT FUNCTIONS

The DigitalIn interface is used to read the value of a digital input pin.

For hardware setup, refer to the previous lab notes ("Interrupt and Low Power Features" or "Digital Input/Output and GPIO").

For example, to read the value of a pin:

```
DigitalIn button_press(Input Pin);

int main(){
    if (button_press)
        Led_out = ~Led_out;
}
```

The DigitalOut interface is used to configure and control a digital output pin, for example

```
DigitalOut Led_out(Output Pin);

int main() {
    Led_out = 1;
}
```

### BUS IN/OUT FUNCTIONS

The BusIn interface is used to create a number of DigitalIn pins that can be read as one value.

Any of the numbered mbed pins can be used as a DigitalIn in the BusIn. For example:

```
BusIn My_Bus_In(Input Pin 1, Input Pin 2, Input Pin 3);

int main(){
     if(My_Bus_In == 0x01)
       Led_out = 1;
}
```

The BusOut interface is used to create a number of DigitalOut pins that can be written as one value, for example:

```
BusOut My_Bus_Out(Output Pin 1, Output Pin 2, Output Pin 3);

int main(){
```

```
        My_Bus_Out = (1<<2) | (1<<1);
    }
```

## YOUR APPLICATION CODE

### EXERCISE-1

In the first exercise, you need to use mbed API functions to:

- Define BusIn, BusOut interfaces for inputs and outputs
- The RGB LED is controlled by buttons
    - Button 1: light up RED
    - Button 2: light up GREEN
    - Button 3: light up BLUE
    - Button 4: light up WHITE (RED, GREEN and BLUE)

### EXERCISE-2

In the second exercise, you need to use the mbed API functions to:

Create a system which counts the number of times a digital switch is pressed or changed, and lights an LED when 10 instances have been counted.