GPIO Registers for Lab 1

Direction Register

Pi -> DIR for Port Pi

If a bit is 0 the corresponding pin of Port Pi is an input pin. If the bit is 1 the corresponding pin of Port Pi is an output pin

e.g. P1->DIR = 0b01000001 Pins P1.6 and P1.0 are output pins; Pins P1.7, P1.5,P1,4,P1.3,P1.2, P1.1 are input pins

Output Register (As applicable to output pins)

Pi->OUT If any bit of this register is set to 1 the corresponding pin of Pi will be driven high at 1. If any bit of this register is set to 0 , the corresponding pin of Pi is driven low at 0. (This assumes the pins have been set as output pins by Pi->DIR)

e.g In the above example the pins P1.6 and P1.0 have been set as output pins. If now P1->OUT is set to 0b01000000 P1.6 will be driven high and P1.0 will be driven low.

The rest of the discussion applies to pins configured as input pins in Pi->DIR. Unlike pins configured as output pins, pins configured as input pins also need to have a resistor configured as pull-up or pull-down

Resistor Enable Register

Pi->REN for Port Pi

Applicable for input pins. If a bit of this register is 1 the resistor connected to the corresponding pin of Port Pi is enabled. If the bit is 0, the resistor connected to the corresponding pin of Port Pi is disabled.

E,g, In the above example if P1->REN = 0b 00100100 pins P1.5 and P1.2 will have their resistors enabled; pins P1.7,P1,4,P1.3, P1.1 will have their resistors disabled (Note: Pins P1.6 and P1.0 were already set as output pins in P1->DIR and hance P1->REN will have no effect on these pins)

Output Register (As applicable to input pins)

Pi->OUT

If a pin of PORT Pi has been set as input pin in Pi\_>DIR and its resistor is enabled in Pi->REN any bit set as 1 in Pi\_>OUT register will the resistor will be a pull-up resistor. If the bit is set as 0 the resistor will be a pull-down resistor

e.g. Continuing the above example if P1->OUT is set to 0b00100000 P1.5 will have a pull-up resistor and P1.2 will have a pull-down resistor

Input Register

Pi->IN

This register reads the input arriving on an input pin which has been appropriately configured with a pull-up or pull-down resistor. In the former case if the switch is not pressed , the pin will read a high or 1 and if the switch is pressed it will read a low or 0. In the latter case , if the switch is not prssed it will read a low or 0 and if the switch is pressed it will read a high or 1. Thus it is possible to detect whether the switch is pressed by taking a reading on Pi->IN

E,g. continuing the above example if P1.6 reads 0 the switch is pressed; if it reads 1 the switch is not pressed. Whereas, if P1.0 reads a 1 the switch is pressed; if it reads a 0 the switch is not pressed