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## Pre-lab 1

a)

- a. Initialize opens the physical memory and maps it into the virtual space for the I/O so that we can view/control it
- b. Finalize un maps the virtual space and closes the memory
- c. RegisterRead reads the value of the passed in I/O address
- d. RegisterWrite sets the value of the passed in I/O address

b)

```
/** Changes the state of an LED (ON or OFF)
 * @param pBase base address of I/O
 * @param ledNum LED number (0 to 7)
 * @param state State to change to (ON or OFF)
 */
void Write1Led(char *pBase, int ledNum, int state)
{
    int ledOffset = 0x4 * ledNum + gpio_led1_offset;
    RegisterWrite(pBase, ledOffset, state);
}
```

c)

```
/** Reads the value of a switch
 * - Uses base address of I/O
 * @param pBase base address of I/O
 * @param switchNum Switch number (0 to 7)
 * @return Switch value read
 */
int Read1Switch(char *pBase, int switchNum)
{
    int switchOffset = 0x4 * switchNum + gpio_sw1_offset;
    return RegisterRead(pBase, switchOffset);
}
```