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| BLG351E  Experiment 2 “General Purpose Input Output”  REPORT | CRN | 12633 |
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| Q1) (40 pts.) What are pull-up & pull-down resistors? Which category contains your button type in the experiment? | | |
| In digital circuits the pins are always be either 1 or 0. Some cases we want to change pin’s state 1 to 0 or 0 to 1. Moreover we want to hold pins in that values after change operation. Also we might want to assign default values (0 or 1) to the pins. It is possible with connect the pin, which is wanted to make default 0, to the ground and connect the pin, which is wanted to make default 1, to the supply voltage. This may conclude with either damaging logic circuit elements or floating the pins’ outputs.  To prevent these unwanted situations some kind of resistors, called pull up and pull down, can be added to the circuit.  When the resistor connected with the logic voltage from the supply voltage and switch connected with the logic voltage from the ground voltage, resistor act as pull up resistor which makes the pin always 1 until the switch is pressed and the pin is shorted to ground making it 0.  When the resistor connected with the logic voltage from the ground voltage and switch connected with the logic voltage from the supply voltage, resistor act as pull down resistor which makes the pin always 0 until the switch is pressed and the pin is shorted to supply voltage making it 1.  Button in the experiment contains pull down resistor, default values’ were 0. | | |
| Q2) (30 pts.) What is switch debouncing and why does it occur? How did you handle this problem on your experiment? | | |
| Switches can be described as the cables that can swap being connected and not connected to the circuit. When a switch closed actually two parts of the circuit comes together. Initially switch makes contact with the other part of the circuit but this take just microseconds, then they contact a little bit longer. This sequence continues repeatedly until swtich fully closed. This is called switch bouncing. Switch bouncing may consequence with either observing output several times bliping or false outputs. Because usually, the hardware works faster than the bouncing, which results in that the hardware thinks you are pressing the switch several times. Switch debouncing is the way that provides preventing from switch bouncing. We put a lock flag that forces the input to do nothing if is set. After the first press, this flag is set, and when the input is released, it is reset. | | |
| Q3) (30 pts.) What does “.data” represent? Which memory address is allocated using “.data” directive? | | |
| “.data” is an assembler directive. It represents flash memory and this memory space used for initialized data. It is used to imitate the variable declaration in high-level programming languages.  This memory space begins from #0200h address line and it goes to #027Fh address line. So when “.data” directive use #0200h address line is allocated. This means when this directive used, program branchs to flash memory which is #0200h address line. | | |