15 Answers to the assignments

This section contains the answers to all assignments in this course. If the answer is a microcontroller program than the source code of that program is in the free download file, listed under the section number. There should be no need however to actually uses these sources.

Every listing is also supplied on paper. It is much easier to compare your program, while it is on the screen, with the correct answer on a piece of paper. Make any corrections into your own programs, and then try them again, until they are actually running. That is the only way that you will learn from your mistakes and get better at every new program. The purpose of this course is not to supply you with a bunch of programs, but to teach you how to write those programs, and any others that you fancy, by yourself.

Answers section 1

1.a Assignments

1. *Explain why English is not a formal language.*

The same sentence can have multiple meanings.

2. *List the four types of commands.*

Input, output, operation, flow control.

Answers section 3

3.a Assignments

1. *If the voltage is 5 volt and the resistor is 100 ohm, what according the Ohm's law is the current (there is no LED in this circuit)?*

I = V / R = 5 / 100 = 50 mA

2. *The same as question 1, but this time a LED is in the circuit. What do you think will happen to the LED in this situation?*

V = 5 - 1.8 = 3.2 Volt
I = V / R = 3.2 / 100 = 32 mA.
Since the maximum current for the LED is 25 mA the LED will breakdown quickly.

3. *What does movlw stand for, and what does it do.*

Move Literal to W. It moves a value to the working register.

4. *Write an assembler program that switches on both LEDs 0 and 1 on port C.*

```
asm
{
    movlw 0b00000000
    movwf _trisb
    movlw 0b00000011
    movwf _portb
}
```