Module B.7: More Arduino Projects

Level 1:

1. The initialization statement is executed only once. Then, the test expression is evaluated. If the test expression is false (0), for loop is terminated. But if the test expression is true (nonzero), codes inside the body of for loop is executed and the update expression is updated. This process repeats until the test expression is false.
    a. The for loop ends when the expression is false (0).
    b. The for loop is usually used when the programmer knows how many times a set of statements are to be executed. The while loop is used to carry out looping operations, in which a group of statements are executed repeatedly, until some condition is satisfied. And the do..while loop is a variant of while loop but it is exit controlled, whereas, while loop was entry controlled. Exit controlled means unlike while loop in do..while first the code inside the loop will be executed and then the condition is checked. In this way even if the condition is false the code inside the loop will be executed once which doesn't happen in while.

2. All comparison operators defined for the C language other than the "<" comparator:

- != (not equal to)
- <= (less than or equal to)
- == (equal to)
- > (greater than)
- >= (greater than or equal to)

b) An example of the "for" loop to use the "<=" comparator:

```
// Dim an LED using a PWM pin

int PWMpin = 10; // LED in series with 470 ohm resistor on pin 10

void setup()
```

```
{

// no setup needed

}



void loop()

{

 for (int i=0; i <= 255; i++){

        analogWrite(PWMpin, i);

        delay(10);

}

}
```

3. The “++” incrementor operator increments the value of a variable by 1 whereas the “=+ 1” assignment sets a variable (in this case, the variable is set to 1).

    b) An example where the “for” loop uses “=+”:

    ```
    for(int x = 2; x < 100; x = x * 1.5){

    println(x);

    }
    ```

in this example, “x = 2” is “=+” (the variable of 2 is being assigned)