**Module B.1 Arduino**

**Level 0: Creating an account**

**Complete**

**Level 1: Understanding the Blink Example**

**Complete**

**Level 2: Using External Documentation**

**2.**

**Setup:** The setup function is used when a sketch starts. It is used to initialize variables, pin modes, start using libraries, etc. The setup function will only run once, after each powerup or reset of the Arduino board.

**Void**: The void keyword is used only in function declarations. It indicates that the function is expected to return no information to the function from which it was called.

**Loop**: After creating a setup() function, which initializes and sets the initial values, the loop() function does precisely what its name suggests, and loops consecutively, allowing your program to change and respond. Use it to actively control the Arduino board.

**Digital Write**: a HIGH or a LOW value to a digital pin.

**LED\_BUILTIN**: The constant led\_builtin is the number of the pin to which the on-board LED is connected. Most boards have this LED connected to digital pin 13.

**High**: The meaning of HIGH, is different depending on whether a pin is set to an input or output. When a pin is configured as an input with pinMode, and read with digitalRead, the Arduino (Atmega) will report high if:

* a voltage greater than 3.0V is present at the pin (5V boards);
* a voltage greater than 2.0V is present at the pin (3.3V boards);

A pin may also be configured as an input with pinMode, and subsequently made high with digitalWrite. This will enable the internal 20K pull-up resistors, which will pull up the input pin to a high reading unless it is pulled low by external circuitry. This is how input\_pullup works and is described below in more detail.

When a pin is configured to output with pinMode, and set to HIGH with digitalWrite, the pin is at:

* 5 volts (5V boards);
* 3.3 volts (3.3V boards);

In this state it can source current, e.g. light an LED that is connected through a series resistor to ground.

**LOW**: The meaning of LOW also has a different meaning depending on whether a pin is set to input or output. When a pin is configured as an input with pinMode, and read with digitalRead, the Arduino will report LOW if:

* a voltage less than 1.5V is present at the pin (5V boards);
* a voltage less than 1.0V (Approx.) is present at the pin (3.3V boards)

When a pin is configured to OUTPUT with pinMode, and set to LOW with digitalWrite, the pin is at 0 volts (both 5V and 3.3V boards). In this state it can sink current, e.g. light an LED that is connected through a series resistor to +5 volts (or +3.3 volts)

**Delay**:. Pauses the program for the amount of time (in milliseconds) specified as parameter. (There are 1000 milliseconds in a second.)

4.

**Constant**: They can never change their value

**Variables:** They can change values at any time

5.

a.    **Syntax error**: a character or string incorrectly placed in a command or instruction that causes a failure in execution.

b.   **Logic error**: a bug in a program that causes it to operate incorrectly. A logic error produces unintended or undesired output or other behavior, although it may not immediately be recognized as such.

c.      **Run-time error:** A runtime error is a program error that occurs while the program is running.

**Arduino code explained**

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void setup(output) { ( **void**: It indicates that the function is expected to return no information to the function from which it was called.)

( **Setup**: Use it to initialize variables, pin modes, start using libraries, etc. The setup function will only run once, after each power up or reset of the Arduino board.)

}

void loop() { (This line makes sure that the code will keep reaping itself)

}digitalWrite (LED\_BUILTIN, HIGH); { (This line is used to turn the light on)

}delay(1000); { (This is the delay time for after the light blinks, in this case it is 1 second)

}digitalWrite (LED\_BUILTIN, LOW); { (This line is used to turn the light off)

}delay(1000); {

}digitalWrite(LED\_BUILTIN, HIGH); {

}delay(1000); {

}digitalWrite(LED\_BUILTIN, LOW); {

}delay(1000); {

}digitalWrite(LED\_BUILTIN, HIGH); {

}delay(10000); {

}digitalWrite(LED\_BUILTIN, LOW); {

}delay(10000)