

Program Flow / Control

/ Each Arduino Sketch must contain the following two functions */*

```
void setup()
{
  // runs only once.
}
void loop()
{
  // runs repeatedly.
}
```

```
delay(time_millis); // pauses program in ms
delayMicroseconds(time_micros); //pause µs
```

Basic Logic

Simple if()-else

```
if(condition)
{
  //true condition code here
}
else
{
  //false statement code here
}
-----
```

Compound if()-else if()-else

```
if(condition1)
{
  //true condition1 code here
}
else if(condition2)
{
  //true condition2 code here
}
else
{
  //false statement code here
}
```

Pin Configuration - INPUT vs OUTPUT

```
pinMode(pin, INPUT/OUTPUT/INPUT_PULLUP);
```

OUTPUT Control

```
digitalWrite(pin, val); // val: HIGH or LOW
analogWrite(pin, val); // val: 0 to 255.
```

```
tone(pin, freq); // freq in Hertz
tone(pin, freq, duration); //duration in ms
noTone(pin); // stop tone on pin
```

Reading INPUTS

```
buttonPress = digitalRead(pin); // any pin
sensorVal = analogRead(pin); // A0-A5 pins
```

Communication

```
Serial.begin(baudrate);
Serial.print(""); // print data out
Serial.println(""); // print with new line

x = Serial.read(); // reads a single byte
// data
x = Serial.parseInt(); // read the next
// available integer
```

Looping

```
while(condition)
{
}
for(init; condition; update variable)
{
}
```

Comments/Debug

```
/* this is a multiline comment. nothing
between here will be run or executed */
```

```
// this is a single
// line comment
```

Data \ Variable Types

```
const (indicates a constant data type)
void (null data type)
int (integer -32,768 to 32,767)
float (floating point / decimal numbers)
arrayName[] - list of elements (any type)
String (array of characters)
```

System constants / functions

```
HIGH / LOW
OUTPUT / INPUT / INPUT_PULLUP
```

```
millis(); //returns # of milliseconds
micros(); //returns # of microseconds
```

Math Operators

```
= // assignment
+ // addition
- // subtraction
* // multiplication
/ // division
% // modulus
```

Logic Operators

```
== // is equal to?
!= // is not equal to?
< // less than
> // greater than
<= // less than or equal
>= // greater than or equal
&& // compound AND
|| // compound OR
! // NOT (inverse)
```

Libraries

```
#include <libraryName.h>
```

```
libraryName objectName;
```

```
// read library documentation for usage.
```