Language Reference

Arduino programs can be divided in three main parts: *structure*, *values* (variables and constants), and *functions*.

Structure

- setup()
- loop()

Control Structures

- if
- if...else
- for
- switch case
- while
- do... while
- break
- continue
- return
- goto

Further Syntax

- ; (semicolon)
- {} (curly braces)
- // (single line comment)
- /* */ (multi-line comment)
- #define
- #include

Arithmetic Operators

- = (assignment operator)
- + (addition)
- - (subtraction)
- * (multiplication)
- / (division)
- % (modulo)

Comparison Operators

- == (equal to)
- != (not equal to)
- < (less than)

Variables

Constants

- HIGH | LOW
- INPUT | OUTPUT | INPUT_PULLUP
- LED_BUILTIN
- true | false
- integer constants
- floating point constants

Data Types

- void
- boolean
- char
- unsigned char
- byte
- int
- unsigned int
- word
- long
- unsigned long
- short
- float
- double
- string - char array
- String - object
- array

Conversion

- char()
- byte()
- int()
- word()
- long()
- float()

Variable Scope & Qualifiers

- variable scope

Functions

Digital I/O

- pinMode()
- digitalWrite()
- digitalRead()

Analog I/O

- analogReference()
- analogRead()
- analogWrite() - *PWM*

Due only

- analogReadResolution()
- analogWriteResolution()

Advanced I/O

- tone()
- noTone()
- shiftOut()
- shiftIn()
- pulseIn()

Time

- millis()
- micros()
- delay()
- delayMicroseconds()

Math

- min()
- max()
- abs()
- constrain()
- map()
- pow()
- sqrt()

- [>](#) (greater than)
- [<=](#) (less than or equal to)
- [>=](#) (greater than or equal to)

Boolean Operators

- [&&](#) (and)
- [||](#) (or)
- [!](#) (not)

Pointer Access Operators

- [* dereference operator](#)
- [& reference operator](#)

Bitwise Operators

- [&](#) (bitwise and)
- [|](#) (bitwise or)
- [^](#) (bitwise xor)
- [~](#) (bitwise not)
- [<<](#) (bitshift left)
- [>>](#) (bitshift right)

Compound Operators

- [++](#) (increment)
- [--](#) (decrement)
- [+=](#) (compound addition)
- [-=](#) (compound subtraction)
- [*=](#) (compound multiplication)
- [/=](#) (compound division)
- [&=](#) (compound bitwise and)
- [|=](#) (compound bitwise or)

- [static](#)
- [volatile](#)
- [const](#)

Utilities

- [sizeof](#)()

Trigonometry

- [sin](#)()
- [cos](#)()
- [tan](#)()

Random Numbers

- [randomSeed](#)()
- [random](#)()

Bits and Bytes

- [lowByte](#)()
- [highByte](#)()
- [bitRead](#)()
- [bitWrite](#)()
- [bitSet](#)()
- [bitClear](#)()
- [bit](#)()

External Interrupts

- [attachInterrupt](#)()
- [detachInterrupt](#)()

Interrupts

- [interrupts](#)()
- [noInterrupts](#)()

Communication

- [Serial](#)
- [Stream](#)

USB (Leonardo and Due only)

- [Keyboard](#)
- [Mouse](#)