Structure void setup() void loop() Control Structures if (x<5){ } else { } switch (myvar) { case 1: break: case 2: break; default: for (int i=0; $i \le 255$; i++){ } while $(x<5)\{-\}$ do $\{ \}$ while (x<5): continue; //Go to next in do/for/while loop return x; // Or 'return;' for voids. goto // considered harmful :-) Further Syntax // (single line comment) /* (multi-line comment) */ #define DOZEN 12 //Not baker's! #include <avr/pgmspace.h> General Operators = (assignment operator) + (addition) - (subtraction) * (multiplication) / (division) % (modulo) != (not equal to) == (equal to) < (less than) > (greater than)

<= (less than or equal to) >= (greater than or equal to) && (and) || (or) ! (not)

Pointer Access & reference operator * dereference 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)

ARDUINO CHEAT SHEET V.02B

Mostly taken from the extended reference: http://arduino.cc/en/Reference/Extended

Constants

INPUT | OUTPUT

143 // Decimal number

B11011111 //Binary (8-bits only)

3.4028235E+38)

double (currently same as float)

char S2[8]={'a','r','d','u','i','n','o'};

//Included \0 null termination

char S3[8]= $\{'a','r','d','u','i','n','o','\setminus 0'\}$;

sizeof(myint) // returns 2 bytes

15UL // Force long unsigned

10.0 // Forces floating point

0173 // Octal number

0x7B // Hex number

7U // Force unsigned

10L // Force long

2.4e5 // 245,000

void

Strings

char S4[] = "arduino";

char S5[8] = "arduino";

Arrays

Conversion

int myInts[6]:

char()

long()

int()

char S6[15] = "arduino";

 $int myPins[] = \{2, 4, 8, 3, 6\};$

int mySensVals $[6] = \{2, 4, -8, 3, 2\};$

byte()

word()

float()

char S1[15];

Data Types

HIGH | LOW

true | false

Gavin Smith - Robots and Dinosaurs, The Sydney Hackspace



| Qualifiers static // persists between calls volatile // use RAM (nice for ISR) const // make read-only PROGMEM // use flash | External Interrupts attachInterrupt(interrupt, function, [LOW,CHANGE,RISING,FALLING detachInterrupt(interrupt) interrupts() |
|---|---|

1152001)

end()

int available()

byte read(intAddr)

Servo (#include <Servo.h>)

write(angle) // 0-180

1500 is midpoint

read() // 0-180

detach()

begin()

send(mybyte)

send(char * mystring)

send(byte * data, size)

endTransmission()

onReceive(handler)

onRequest(handler)

int read()

flush()

print()

write()

println()

14400, 19200, 28800, 38400, 57600,

EEPROM (#include <EEPROM.h>)

write(intAddr,myByte)

attach(pin, [min uS, max uS])

attached() //Returns boolean

SoftwareSerial(RxPin,TxPin)

// #include<SoftwareSerial.h>

begin(longSpeed) // up to 9600

print(mvData) or println(mvData)

Wire (#include <Wire.h>) // For I2C

begin(addr) // Join as slave @ addr

beginTransmission(addr) // Step 1

byte available() // Num of bytes

byte receive() //Return next byte

requestFrom(address, count)

// Join as master

// Step 2

// Step 3

char read() // blocks till data

writeMicroseconds(uS) //1000-2000,

Digital I/O pinMode(pin, [INPUT,OUTPUT]) digitalWrite(pin, value) int digitalRead(pin) //Write High to inputs to use pull-up res

Analog I/O analogReference([DEFAULT,INTERNA L,EXTERNAL]) twice if source. PWM

```
rammierung
```

| Mat | h | |
|----------|---------------|---------------|
| min(x, y |) max(x, y | y) abs(x) |
| constrai | n(x, minval, | maxval) |
| map(val | , fromL, from | nH, toL, toH) |
| pow(bas | e, exponent) | sqrt(x) |
| sin(rad) | cos(rad) | tan(rad) |

| sin(raa) cos(raa) tiin(raa |
|---------------------------------|
| |
| Random Numbers |
| randomSeed(seed) // Long or int |
| long random(max) |
| long random(min, max) |
| |
| Dita and Datas |

| long random(mi | n, max) | _ |
|---------------------|----------------------|----|
| Bits and By | tes | 51 |
| lowByte() | highByte() | |
| bitRead(x,bitn) | bitWrite(x,bitn,bit) | |
| bitSet(x,bitn) | bitClear(x,bitn) | |
| bit(bitn) //bitn: (| -LSB 7-MSB | 人 |

| Nanoí Proí Proffini | Mega. |
|--|-------------------------------------|
| External Interrupts #of IO (Nano has 14+8) 54+18 | analog |
| attachInterrupt(interrupt, function, 0 - RX1 | 1 - TX1 2 18 - TX |
| detach Interpret(interpret) | 2 16 - TX 3 16 - TX 4 14 - TX |
| interrupts() 2 - (Int 0) 2.3,21,3 | 0,19,18 |
| noInterrupts() Ext Interrupts 3 - (Int 1) (IRQ0-1 | RQ5) |
| Libraries: 9,10 - Timer 1 9,11 - Timer 2 0-13 | |
| Serial. 10 - SS 53 - SS 11 - MOSI 51 - MOSI 50 | |
| begin([300, 1200, 2400, 4600, 9000, 12-MISO 50-MIS | 30 |

| ' | 120 | Analog4 - St Analog5 - St | | |
|---|---|--|---------------------------------|--|
| | (RESET) PAZ [1] (RIDI POO [2] (RIDI POO [2] (RIDI POO [3] (RIDI POO [3] (RIDI PAO [3] POO [4] POO [5] POO [7] POO [9] | y2313 20 Dvcc 19 Dr87 (SGU) 11 Dr85 (MSG) 17 Dr85 (MSG) 15 Dr83 15 Dr83 15 Dr83 14 Dr82 13 Dr81 12 Dr80 | MSO (L) SCK (3) RESET (3) | 121 VCC 141 MG/21 151 CWC 15 |
| 7 | PASSETMACOL PRO ESC OTRALAMOCOL PRO ESC OTRALAMOCOL PRO ESC OROS EN | 11 DP06 25/45/85 45/40/85 45/40/850/85/85/85/85/85/85/85/85/85/85/85/85/85/ | | Black GMD Brawn CTS# Fed VCC Onange TXD Velow PXTS# |

ATMega168 ATMega328 ATmega1280

19 - RX2 18 - TX2

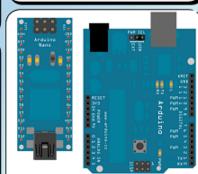
17 - RX3 16 - TX3

15 - RX4 14 - TX4

Duemilanoveí Nanol Prof

boobtloader) SRAM

EEPROM 512B



Pics from Fritzing.Org under C.C. license

| void boolean (0, 1, false, true) char (e.g. 'a' -128 to 127) | int analogRead(pin) //Call to switching pins from high Z s analogWrite(pin, value) // P |
|--|---|
| unsigned char (0 to 255) | analog write(pin, value) ii F |
| byte (0 to 255) | PWM – ESP32 |
| int (-32,768 to 32,767) | ledcAttachPin(pin, port); |
| unsigned int (0 to 65535) | ledcSetup(port, 4000, 8); |
| word (0 to 65535) | ledcWrite(port, wert); |
| long (-2,147,483,648 to | (wichtig für die PWM-Progra |
| 2,147,483,647) | mit dem ESP32) |
| unsigned long (0 to 4,294,967,295) | 20 20. 22, |
| float (-3.4028235E+38 to | |

| Time | |
|-------------|----------------------------------|
| unsigned lo | ng millis() // 50 days overflow. |
| unsigned lo | ng micros() // 70 min overflow |
| delay(ms) | |
| delayMicro | oseconds(us) |

| Math | | |
|-------------|--------------|--------------|
| min(x, y) | max(x, y) | abs(x) |
| constrain(| x, minval, m | axval) |
| map(val, fi | romL, fromH | I, toL, toH) |
| pow(base, | exponent) so | qrt(x) |
| sin(rad) | cos(rad) | tan(rad) |

| Random Numbers |
|---------------------------------|
| randomSeed(seed) // Long or int |
| long random(max) |
| long random(min, max) |
| |
| |

| Ш | | SPI | 13 - SCK | | 52 - SC | | |
|----|---|-------------------------------|------------------------------------|--------|-----------|-----------------------------|--------|
| ш | | | Analog4 - Si | | 20 - SC | | |
| П | 1 | 120 | Analog5 - Si | CK | 21 - SC | L. | 1 |
| | | $\overline{}$ | | | | | |
| | , | = | | _ | | | \geq |
| ш | 1 | ATtiry? | 2313 | | ISP H | eader 6-pin | 7 |
| ш | ı | | _ | | | • • ISI VOC | - 1 |
| ш | ı | (RESET) RAZ [2] | 20 DVCC | - | SCK (0) | • • 141 MOSI • • 161 GND | - 1 |
| ш | ı | (FXID) PD0 [2] | 19 3 P87 (SOL) | | | | |
| ш | ı | (IXB) PO113 (XTAL2) F81 E4 | 18 3PB5 (MISO) 17 3PB5 (MOSI) | | ISP Her | ider 10-pin | ┒ |
| ш | ı | OCTALL) PAD D | 16 DP84 | II | si (i) [| • • (2) VCC | - 1 |
| | ı | PD2 E 6 | 15 DPB3 | | 4C (3) | • (2) VCC | |
| 41 | ı | PD3 E 7 | 14 DP82 | | ET (5) | • • (6) GND | |
| | ı | PC4 E8 | 13 DP81 | | CK (7) | • • (80 GMD | |
| ١. | ı | PO5 E9 | 12 DP80 | | | | |
| П | ı | GMDE 10 | 11 DP06 | | FTD | (Cable | ╗ |
| , | ı | | | ll | - 10 | 1 | - 1 |
| 7 | П | ATIMy25 | V15/015 | íl 🕳 | | Black GMD Brown CTS: | |
| | П | PARSITMOCOL PAY (\$1) | dayor | - | | Fied VCC Ononge TXD | - 1 |
| ` | П | OFMILIMOCH PRO E 2 | 2 TRES (SIGNARCE) 6 TRES (RISO) | | | School POSS | |
| П | П | CAG E 4 | NOT PROCEED ON THE PARTY. | ll . | | 0.00 | 1 |
| ш | ľ | 1710 | 201112222 | 4 | | 12C | = |
| ш | П | Almega48 | 88/168/328 A | rauino | | V00 | -1 |
| ш | П | RESET | | | | SCL | =1 |
| ш | П | DIOD RXD | | | | GNO | =1 |
| ш | П | DIO1 TXD | 3 260 | AIN | | -88 8 March 1976 | 200 |
| ш | П | (pwm) DIO3 | 246 | AIN | | | |
| ш | П | 0104 | 6 23 0 | AIN | | | |
| ш | П | VCC | | | | | |
| Ш | П | GND | | | | | |
| 7 | П | XTM.1 | | | 12 | - | |
| | П | | 011 18 D MS | | | From | |
| • | П | (swm) DIO6 | 12 17 1 100 | | 11 (pvim) | Arduino.C | С |
| ı | П | 0407 | 13 16 2 | | to (perm) | | |
| П | u | DIOS | 14 15 | DIO | 9 (pwm) | | |
| | ٧ | | | | | 1 | - 4 |