

### Initialization

```
pinMode();
pinMode(pin, 1);
pinMode(pin, OUTPUT);
pinMode(pin, 0);
pinMode(pin, INPUT);
```

### Digital Read/Write

```
digitalWrite(pin, 1);
digitalWrite(pin, HIGH);
digitalWrite(pin, 0);
digitalWrite(pin, LOW);
digitalRead(pin);
```

### Analog Read/Write

```
analogRead(sensorPin);
analogWrite(sensorPin);
```

### #define

```
#define LEDL3 6 //Kein "=" oder ";" am
schluss!
#define LED3ON digitalWrite(L3,HIGH)
//Led3 einschalten
```

### Servo

```
#include <Servo.h>
Servo myservo;
myservo.attach(<Pin>); //setup
myservo.write(<0 - 180>);
```

### Serial Monitor

|                         |                                 |
|-------------------------|---------------------------------|
| Serial.begin-(9600);    | im setup() Geschwindigkeit 9600 |
| Serial.print("Text");   | Text ohne Zeilensprung          |
| Serial.print-(wert);    | Ausgabe einer Dezimalzahl       |
| Serial.print(wert,DEC); | Ausgabe einer Dezimalzahl       |
| Serial.print(wert,HEX); | Ausgabe eines Wertes in HE      |
| Serial.print(wert,BIN); | Ausgabe eines Binärwertes       |
| Serial.println();       | Anzeige mit Zeilenumbruch       |

### Variable

|       |         |
|-------|---------|
| byte  | 8 bits  |
| char  | 8 bits  |
| int   | 16 bits |
| float | 32 bits |

### Toggle-Funktion

```
!(digitalRead(L1))
digitalWrite(L1,!digitalRead(L1);
#define Led1Toggle digitalWrite(L1, !digitalRead(L1))
```

### Functions

```
delay(Millisekunden);
delayMicroseconds(Mikrosekunden);
tone(pin, frequency, duration);
millis();
random(min, max);
```

### Vergleichsoperatoren

|    |                    |
|----|--------------------|
| >  | größer als         |
| <  | kleiner als        |
| >= | größer gleich      |
| <= | kleiner gleich     |
| != | ist ungleich       |
| == | identisch mit      |
| =  | Zuweisung Variable |

### Schreibweisen Variablen

|         |           |
|---------|-----------|
| varname | Variable  |
| varName | Variable  |
| Varname | Konstante |
| VarName | Konstante |
| VARNAME | Konstante |



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### while Loop

```
void loop () {
    while (...)
    {
        ...
    }
}
```

### For Loop

```
void loop () {
    for (int i=0;
    i<100; i++) {
        ...;
    }
}
```

### do while Loop

```
void loop () {
    do {
        ...;
    } while(...);
}
```

### if Statement

```
void loop () {
    if (...) {
        ...
    }
    else {
        ...
    }
}
```

### switch Statement

```
void loop () {
    swi tch (...) {
        case a:
            ...;
            break;
        case b:
            ...;
            break;
        case c:
            ...;
            break;
        def ault:
            ...;
            break;
    }
}
```

### counting loops

```
void loop() {
    // put your main code here,
    to run repeat edly:
    Leds();
    del ay(1);
}
void Leds(){
    loo pCo unt erR ed--;
    loo pCo unt erY ell ow--;
    if( loo pCo unt erRed <= 0){
        Red Led Toggle;
        loo pCo unt erRed =
RedLed Fre quenz;
    }
    if( loo pCo unt erY ellow <=
0){
        Yel low Led Toggle;
        loo pCo unt erY ellow =
Yellow Led Fre quenz;
    }
}
```

### millis()-Funktion

```
void setup() {
    sta rtTime = millis(); //
    initia lis ation using actual
    time
}
void loop() {
    if (millis() - startTime >=
period) {
        sta rtTime = millis();
    }
}
```