

# C Programming

## for JavaScript Programmers

Embedded Software

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# C Programming (1)

- JavaScript, C and C++ are almost the same

## JavaScript

```
var n = 0;
if (n !== 0) {
    n = 0;
}
for (var i = 0; i < 5; i++) {
    n = n + i;
}
```

## C/C++

```
int n = 0;
if (n != 0) {
    n = 0;
}
for (int i = 0; i < 5; i++) {
    n = n + i;
}
```

# C Programming (2)

- Do not forget the semicolon in C and C++

## JavaScript

```
var n = 0
if (n !== 0) {
  n = 0
}
for (var i = 0; i < 5; i++) {
  n = n + i
}
```

## C/C++

```
int n = 0;
if (n !== 0) {
  n = 0;
}
for (int i = 0; i < 5; i++) {
  n = n + i;
}
```



Semicolons are obligatory in C.

# C Programming (3)

- In C and C++ everything has a datatype
  - The most important datatypes are:
    - **int**: integer numbers, e. g. 1, 2, 3, ...
    - **double**: floating point numbers, e. g. 1.5, 2.0, ...
    - **char**: characters, e. g. 'a', 'b', 'c', ...
    - **char\***: strings, e. g. "abc", "hello", ...
    - **void**: function has no return value
  - We use **int** and **void**, only.

# C Programming (4)

- Use datatype instead of *var* in C and C++

## JavaScript

```
var x = 1;  
var y = 2;  
var z = x + y;  
var pi = 3.14;
```

## C/C++

```
int x = 1;  
int y = 2;  
int z = x + y;  
double pi = 3.14;
```

# C Programming (5)

- Use datatype instead of *function* in C and C++

## JavaScript

```
function add(a,b)
{
    return a + b
}
function doit()
{
    // Do something
}
```

## C/C++

```
int add(int a, int b)
{
    return a + b;
}
void doit()
{
    // Do something
}
```

# C Programming (6)


- Do not forget the datatype of the parameters

## Best Practice

```
int add(int a, int b)
{
    return a + b;
}
```

## Worst Practice

```
int add(a, b)
{
    return a + b;
}
```



A dashed arrow points from the warning icon to the parameter 'b' in the function signature 'int add(a, b)'.



Everything must have  
a datatype

# C Programming (7)

- Functions can be defined and called

- Definition

```
int add(int a, int b)
{
    return a + b;
}
```

- Call

```
int n = add(1,2);
```

# C Programming (8)

- No function definition without datatype

## Best Practice

```
int add(int a, int b)
{
    return a + b;
}
```

## Worst Practice

```
add(a, b)
{
    return a + b;
}
```

# C Programming (9)

- No function call with datatype

## Best Practice

```
int n = add(1,2);
```

## Worst Practice

```
int n = int add(int 1,2);
```

# C Programming (10)

- There are global and local variables

```
// A global variable
int n = 1;
int f1(void)
{
    // A local variable
    int n = 2;
}
int f1(void)
{
    // Another local variable
    int n = 3;
}
```

# C Programming (11)

- In C or C++ there is no global code

## JavaScript

```
var a = 1;
var b = 2;
alert (a + b);
```

## C/C++

```
void doit(void)
{
    int a = 1;
    int b = 2;
    printf("%d", a + b);
}

// Somewhere else
// ...
doit();
// ...
```

# C Programming (12)

- In C or C++ there are no local functions

## Best Practice

```
int sqr(int n)
{
    return n * n;
}
double hyp(int a, int b)
{
    int a2 = sqr(a);
    int b2 = sqr(b);
    return sqrt(a2+b2);
}
```

## Worst Practice

```
double hyp(int a, int b)
{
    // A local function
    int sqr(int n)
    {
        return n * n;
    }
    int a2 = sqr(a);
    int b2 = sqr(b);
    return sqrt(a2+b2);
}
```