Einführung in C - Introduction to C

4. Control flow

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Statements and blocks

Definition

Every C **statement** is terminated by a semicolon: `statement;`

Multiple statements can be grouped together with curly brackets. This is called a **block.** Syntactically a block is treated like a single statement (e.g. in `if else` constructs):

```
{
    statement1;
    statement2;
    statement3;
}
```

Note: Behind the closing bracket of a block there is no semicolon.

For improved readability, statements within a block should be indented.

Control flow

Statements are executed sequentially one after the other:

```
statement1;
statement2;
statement3;
```

How can this sequence be influenced?

- Decide about execution / non-execution of statements dynamically, i.e. based on results obtained during runtime.

```
if … else
switch … case
```

- Execute the same statements more than once (without copying code), a number of times decided during program execution.

```
while
do … while
for
```

- Generalize/reuse by applying the same statements on different input values

```
function(...)
```

If - else

Definition

```
if( expression )
        statement1;
else
        statement2;
```

If *expression* is not zero *statement1 is* executed otherwise *statement2* is executed.
The `else` *statement2;* part is optional and can be omitted.
It is possible to have sequences of `if-else` constructs.

```
if( x<0 )
{
     x=-x;
     …
}
```

```
if( i )
  printf("i is not 0");
```

```
if( x>0 )
   printf("positive");
else if( x<0 )
   printf("negative");
else
   printf("null");
```

Switch-case

Definition

```
switch( expression )
{
     case constant1: statement1; break;
     case constant2: statement2; break;
     ...
     default: default-statement; break;
}
```

If *expression* is equal to one of the `case` *constants,* the according *statement is* executed. Otherwise the *statement* behind `default` is executed. This is optional.
With `break;` the `switch` block is left. If it is omitted, also the subsequent case commands are executed (which usually is not wanted).

if → switch: Asciiburger

Exercise

`switch-case.c`

Code snippet 401