

Einführung in C - Introduction to C

3. Arrays and strings

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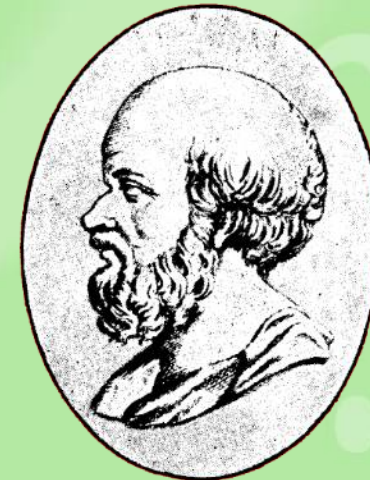
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An **Array** is an ordered list of variables of the same (arbitrary) type.

- The array size, i.e. the number of elements, is part of the definition and remains fixed.
- Variables are accessed via the index (an integer number, first element has index 0). No index checking is done by compiler or at runtime!
- The array size has to be a constant (C90), or can also be a variable (C99), in C11 it depends on the compiler (it's optional) (→ alternative: dynamic memory allocation → later)
- Array elements can be initialized in the declaration providing a list of values, the array size can be omitted and is calculated automatically. There is no default initialization.

```
int a[100];  
char text[1000];  
unsigned int lotto[] = { 2, 5, 17, 36, 40, 7 };  
for(int i=0; i<100; i++)  
    a[i]=0;
```

`eratosthenes.c`



Code snippet
301

Strings are Arrays of characters. In (standard) C there is no special datatype for strings.

- The end of the string is marked with the char value 0.
- Strings can be initialized with a given string in quotes. The string length can then be determined automatically.
- There are standard functions for frequently used string operations, such as String length (strlen), string comparison (strcmp), string concatenation (strcat).

```
char text_buffer[1000];  
char hello[200] = "Hello";  
char name[100] = "No name entered";
```

`string_shuffle.c`

Code snippet
302

`string_comparison.c`

Code snippet
303

`devowelizer.c`

Code snippet
304

Multidimensional arrays

Definition

Multidimensional arrays in C are realized as arrays of arrays.

- All elements in the multidimensional array are of the same type.
- Initialization can be done with nested curly brackets.
- Elements are accessed via their indices, e.g. `a[i][j]`;

```
float matrix[3][3];  
char names[5][100]; // 5 Names with max. 100 chars.  
int numbers[2][3] = {{ 3, 7, 9 }, { 2, 9, 7 }};  
int big[10][10][10];
```

How many elements do these arrays have?

`matrices.c`

Code snippet
305

String arrays: Bullshit generator

Exercise?

`bullshit_generator.c`

Code snippet
306