Notes for C and C++ programming

#c #c++ #notes

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Do not use `sizeof` for array parameters

The function `fun()` below receives an array parameter `arr[]` and tries to find out number of elements in `arr[]` using `sizeof` operator. In main, there is also a statement calculating the number of elements in `arr[]`. But 2 methods return different results.

```
int fun(int arr[]) {
    return sizeof(arr)/sizeof(arr[0]); // WRONG
}

void main()
{
    int arr[4] = {0, 0 ,0, 0};
    int arr_size = sizeof(arr)/sizeof(arr[0]); // RIGHT
    if (arr_size == fun(arr)) {
        // ???
    }
}
```

In C, array parameters are treated as pointers. So the expression:

```
sizeof(arr)/sizeof(arr[0])
```

becomes

```
sizeof(int *)/sizeof(int)
```

which wrongly causes `sizeof(arr) = sizeof(int *) = 4` in all cases.