Header files

Adapted from materials by Dr. Carrier

Francisco Galarza - Unsplash

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How can we reuse this code in different files?

Introducing: header files

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For local headers that we write:

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#include "file.h"
```

What goes in a header file

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(You can put function definitions in headers, there are tradeoffs)

Example header file (`print.h`)

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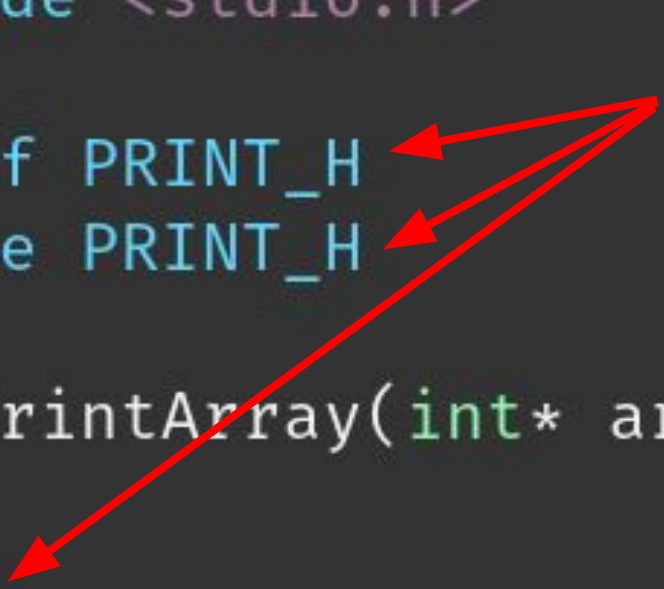

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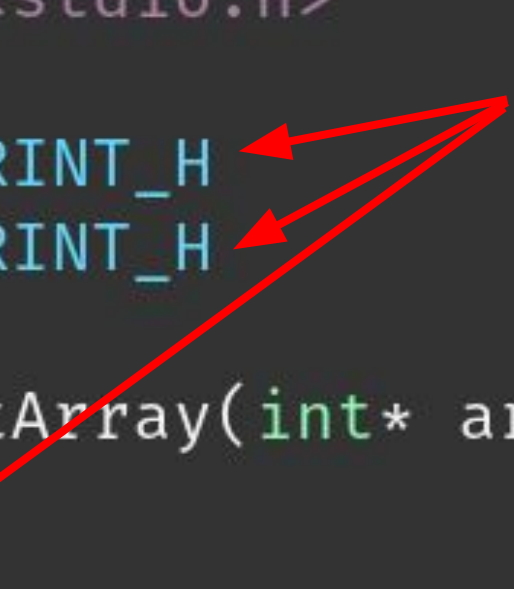

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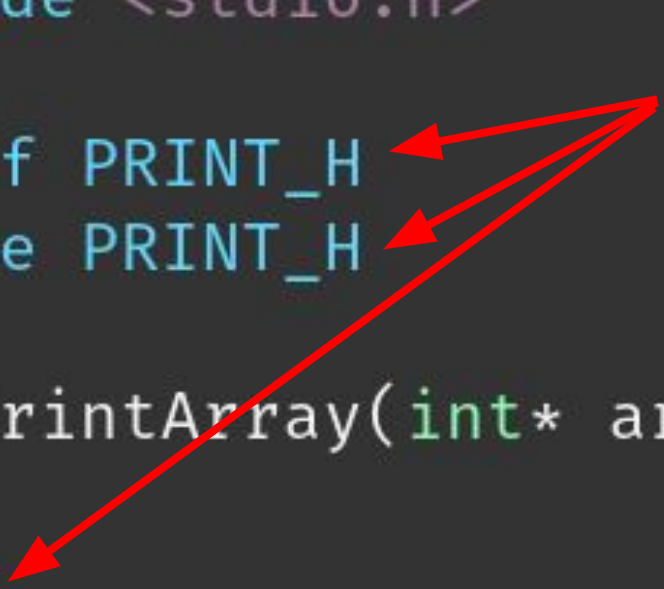

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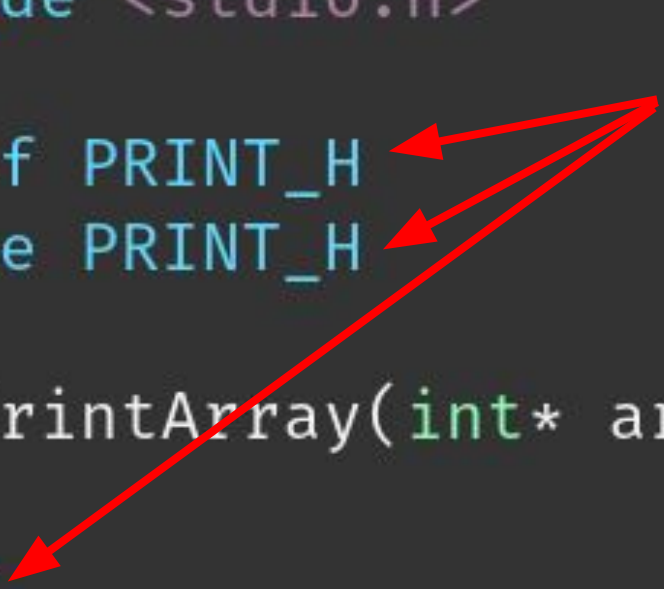

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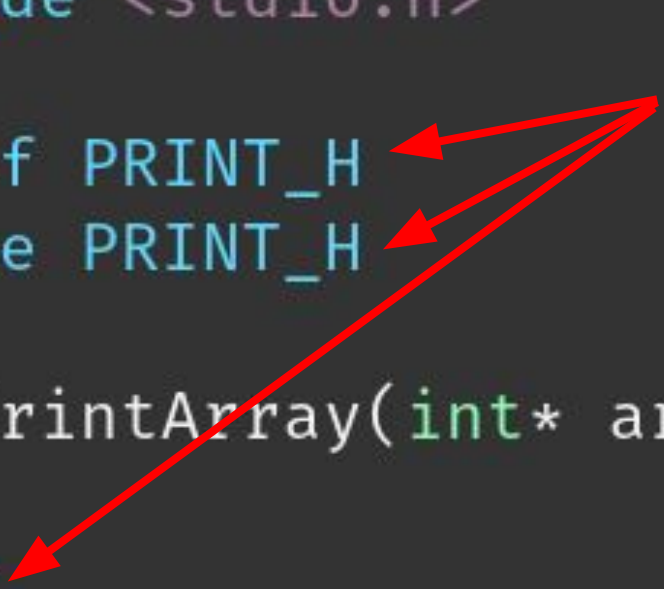

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Because we define the macro inside this if, we ensure we have, at most, one copy of this code!
`#pragma once` is a modern alternative

Where does the function definition go?

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```

(print.c)

Using our header file

```c
#include <stdio.h>
#include "print.h"

int main(){
  int arr_1[] = {0, 1, 2, 3, 4, 5};
  PrintArray(arr_1, 6);
  int arr_2[3];
  arr_2[0] = 1000000;
  arr_2[1] = -57;
  arr_2[2] = 0;
  PrintArray(arr_2, 3);
  return 0;
}
```

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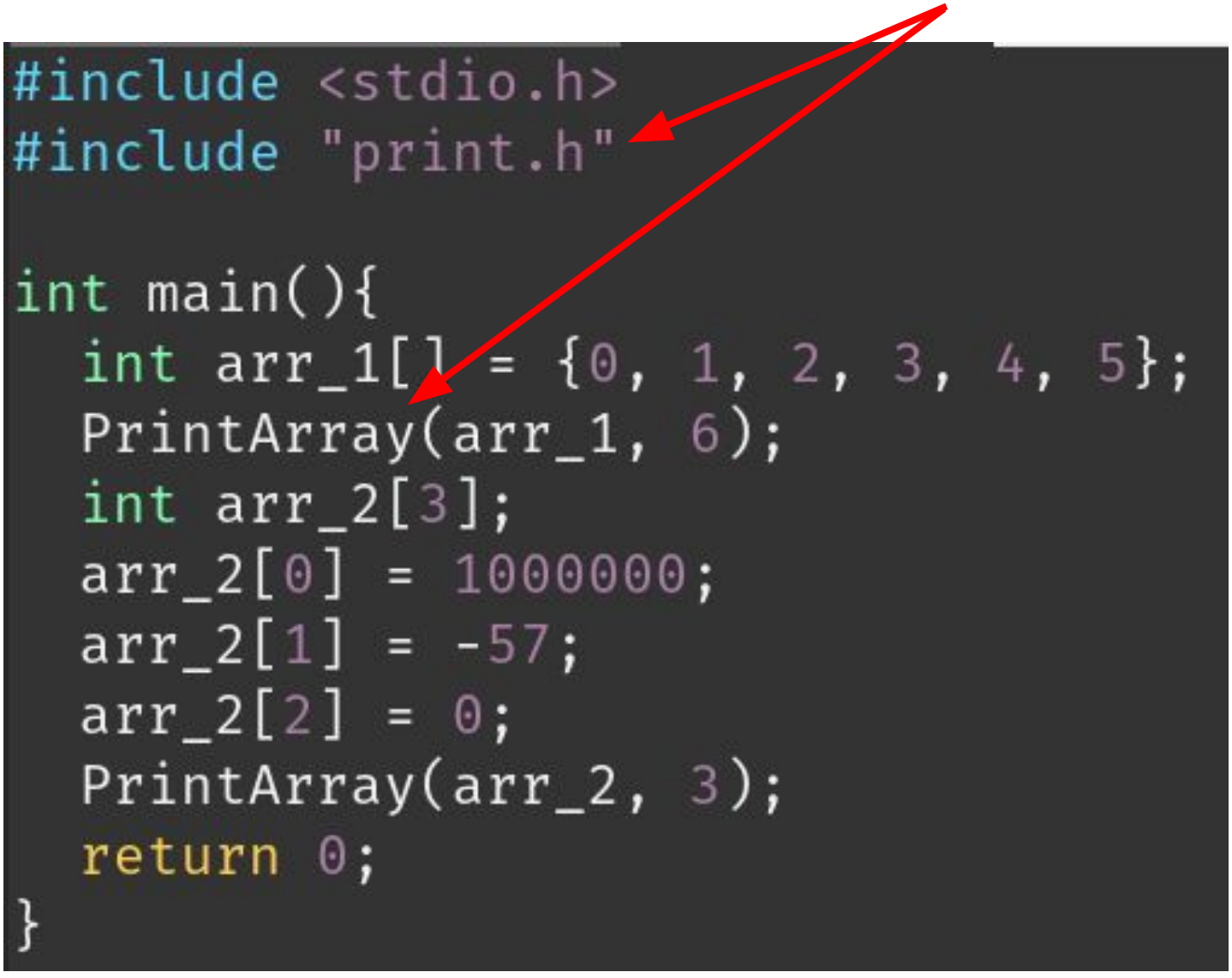

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Our program needs to know about both .c files

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We are linking files together!
(ever had a linker error?)

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Example:

```
gcc -Iother_proj/headers
```

More on preprocessor directives

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List (part 1):

`#include <header.h>` -> paste contents of header.h

`#define NAME X` -> Replace instances of NAME with X

`#define NAME(a) printf(“a”);` -> Can also take arguments

`#undef NAME` -> Undefines NAME

More on preprocessor directives

Remember: these operate on **text**, they do not consider code context

List (part 2):

`#if X` -> Includes following code if X is not 0

`#elsif` and `#else` -> Go with if

`#endif` -> Ends if / elsif / else blocks

`#ifdef X` -> Like if; includes code if X is defined

`#ifndef X` -> Includes if X is NOT defined