

# C Pre-processor

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## #include

- #include <stdio.h>
- #include "filename"
- #include <filename>
  
- The #include ... line is replaced by the contents of the file included.
- A preferred way to tie the declarations together for a large program.

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## #define

- #define name
- #define name text
- Macro substitution: literally replace occurrences of name in the program with text
- name has the same form as variables
- Usage:
  - Constants
  - Repetitive small block of code
  - Debug code
- #undef name
  - It is not an error if the name is not defined originally

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## #define (cont.)

- #define name(parameters) text
- #parameter in the text will put the parameter in double quote
- para1 ## para2 in the text will concatenate the two parameters
  
- Examples:
  - #define MAX(a, b) (a>b?a: b)
  - #define FOO(msg) printf("Print " #msg " :\n")
  - #define FOO(msg1, msg2) msg1 ## msg2

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## Conditional Code

```
#ifdef name  
<code>  
#endif  
  
#ifdef name  
<code>  
#else  
<code>  
#endif
```

```
#ifndef name  
<code>  
#endif  
  
#ifndef name  
<code>  
#else  
<code>  
#endif
```

### Usage

- Making portable code
- Prevent multi-inclusion of header files
- Debugging

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## Conditional Code (cont.)

```
#if constant_expression_1  
<code 1>  
#elif constant_expression_2  
<code 2>  
#else  
<code 3>  
#endif
```

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## Predefined Names

- `__LINE__`: current source line number
- `__FILE__`: filename of the file currently being compiled
- Used for debugging

## Acknowledgement

- John H. Hartman, *Classnotes for Csc352-Spring03*, CS Dept., University of Arizona, 2003
- Brian W. Kernighan, Dennis M. Ritchie, *The C Programming Language (2<sup>nd</sup> Ed.)*, Prentice Hall, 1988