



SMR3821: C
AND LINUX
FOR SCIENCE
ENGINEER-
ING:

INTRODUCTION
TO C
PROGRAMMING

ELLIOT
MENKAH

PREPROCESSOR

SMR3821: C AND LINUX FOR SCIENCE ENGINEERING: INTRODUCTION TO C PROGRAMMING C PREPROCESSOR

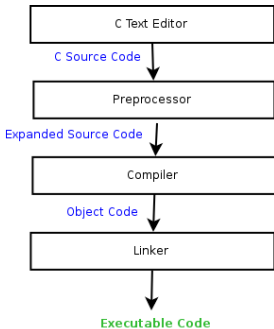
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Steps involved in converting a C Program from source code to an executable



The preprocessor is a program that processes c source code before compilation.

Features of the preprocessor are also known as **directives**.

Directives alter the contents of the source code before compilation.

Directives can be placed anywhere in the program but are usually placed at the start of the program before `main()`

Directive statements are **not terminated**.

The following directives would be considered:

- 1 Macro Substitution(**#define**)
- 2 File Inclusion (**#include**)

```
#define MACRO_TEMPLATE mac
```

- During preprocessing, all **MACRO_TEMPLATES** are replaced with their corresponding **macro_expansion**
- **MACRO_TEMPLATE** by convention is typed in upper case
- **MACRO_TEMPLATE** and the **macro_expansion** are separated by blanks or tabs
- Macros improve readability and makes modifying of source code easier

```
1 #include <stdio.h>
2 #define AND      &&
3 #define MEAN_AGE 15
4 int main()
5 {
6     int mark=80;
7     int age = 9;
8
9     if (age<=MEAN_AGE AND mark>=70)
10    {
11        printf("\nYou are a break!\n");
12    }
13 }
```


Macro Substitution with Arguments

```
1 #include <stdio.h>
2
3 #define SQUARE(l)      (l*l)
4 #define TRIANGLE(b,h) (0.5*b*h)
5
6 int main()
7 {
8     float length =8.0;
9     float b =10.0;
10    float h =2.0;
11
12    printf("\nArea of Square = %.2f\n",SQUARE(length));
13    printf("\nArea of Triangle = %.2f\n",TRIANGLE(b,h));
14
15 }
```

- 1 Don't leave a space between macro template and the argument.
- 2 The entire macro expansion should be enclosed within parenthesis.
- 3 Macros can be split into multiple lines with a `'\'` at the end of each line

```
#include "filename"
```

OR

```
#include <filename>
```

- During preprocessing, the entire line where the `#include` directive is located is substituted with the content of the specified file.
- The `#include` directive facilitates code reuse.
- A large program can be broken down into smaller manageable files. In the file containing the `main()` function, the smaller files can be 'glued' together using the `#include` directive.

#include< ... > & #include“...”

#include< *predac.c* >

Look for the file **predac.c** in the current directory and the specified list of directories.

#include“predac.c”

Look for the file **predac.c** in the specified list of directories only.

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