C-148 ⇒ Macro in C - Preprocessor Commands (#define and #undef)

* We know that you can define Constants in two ways like either using Const keyword or using #define with macroname.

Eg: const int a = 5;

#define NAME_ID 5 ; → do not put semicolon

#define PI 3.14 ;

Eg ① #define A 10

```
int main()
{
    int x = A;
    printf("%d", x); ⇒ (10)
```

* macro name can be in lower or upper case but generally we use uppercase

#define PI 3.14159.

- #define → preprocessor command
- PI → macro name (or) preprocessor variables.
- 3.14159. → character sequence (we can only print string also).

Eg ②

```
#define PI 3.14159
int main()
{
    int r = 5;
    printf("area of circle is = %f", PI*r*r);
    return 0;
}
```

Eg ③ #define MSG "Jerry's Lectures C/C++ NET & JRF"

```
int main()
{
  printf("%s", MSG);
  return 0;
}
```

* We can also define macro's for functions.

Eg ④ #define MUL(a,b) a*b

```
int main()
{
  printf("%d", MUL(2,3));
}
```

⑥
2*3 → 2nd
(a*b) → 1st

* So before compilation these lines are replaced and during compilation we get result faster using macro's.

NOTE

* First the substitution of expression is done first and then evaluation is done.

Eg ⑤ #define MUL(a,b) a*b

```
int main()
{
  printf("%d", MUL(5-2, 7+4));
}
```

⑤
5-14+4.
(5-2*7+4) → 2nd.
(a*b) → 1st

Eg: ⑥ #define MAX(a,b) if(a>b) printf("%d is max"); else printf("%d is max",b);

```
int main()
{
    MAX(5,6);
    return 0;
}
```

expanded source code by substituting these what lines of code.

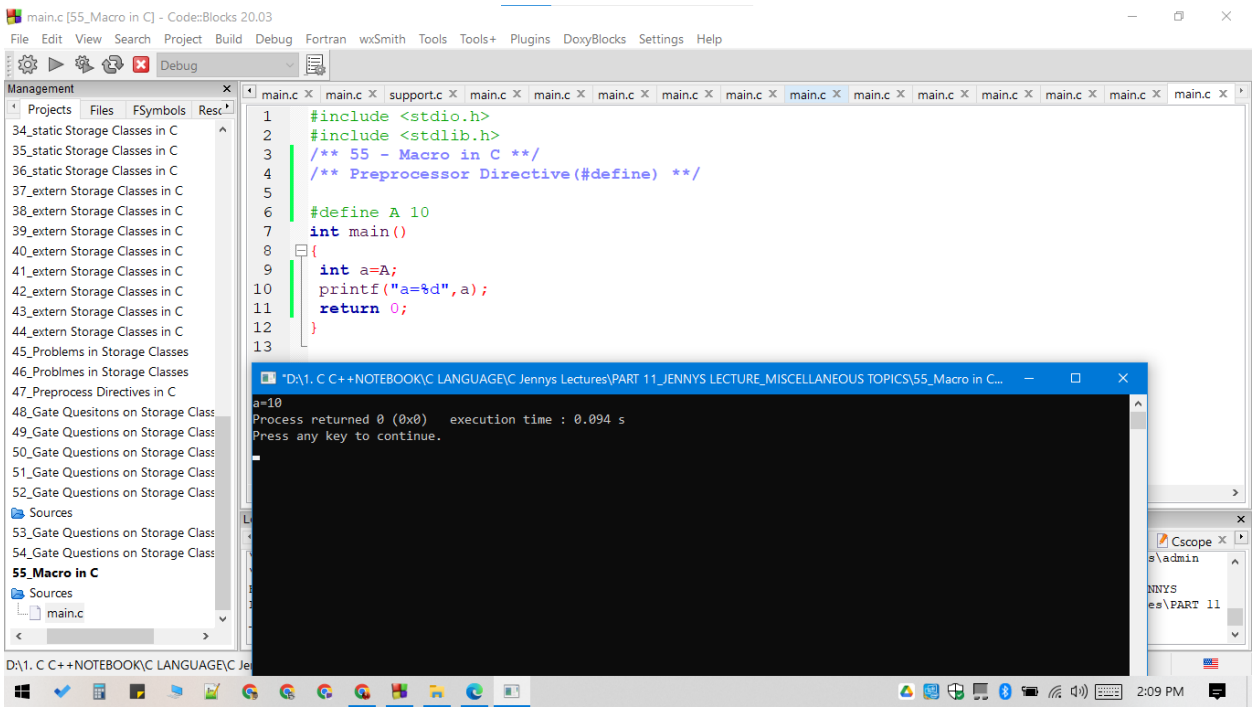
* #undef is used to undefine a macro which is already defined.

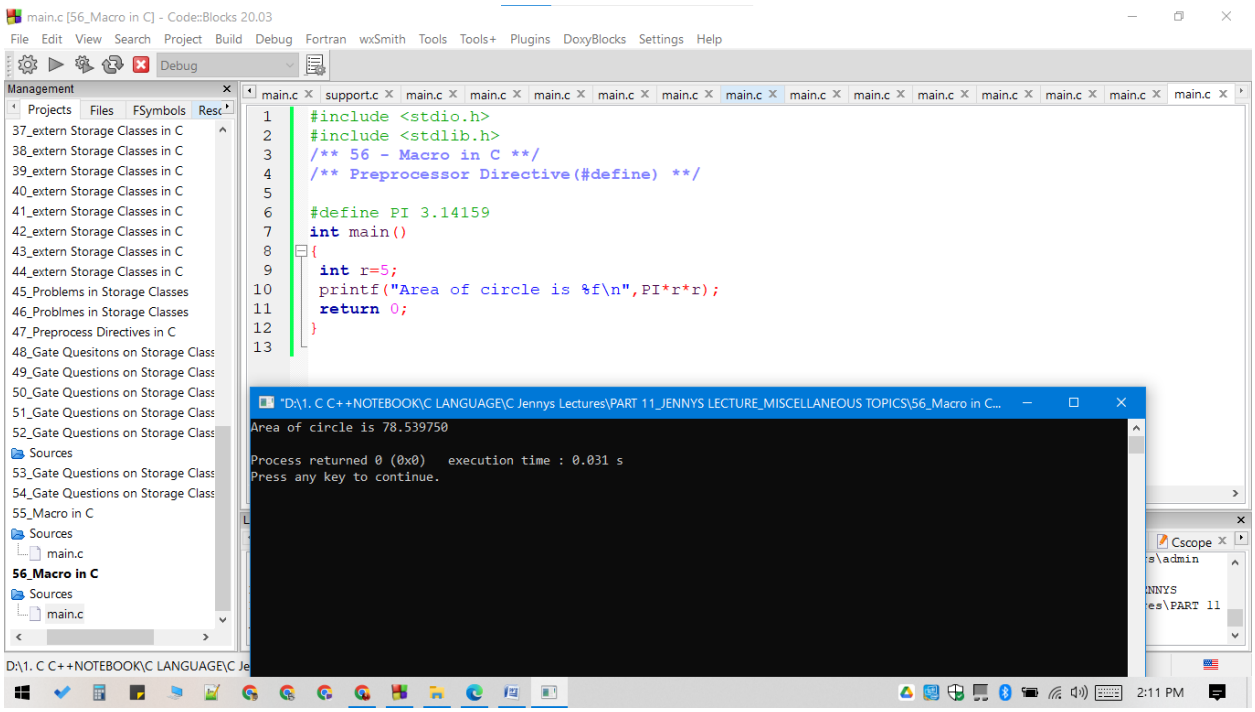
Eg: ⑦ #define MAX(a,b) if(a>b) printf("%d is max",a); else printf("%d is max",b);

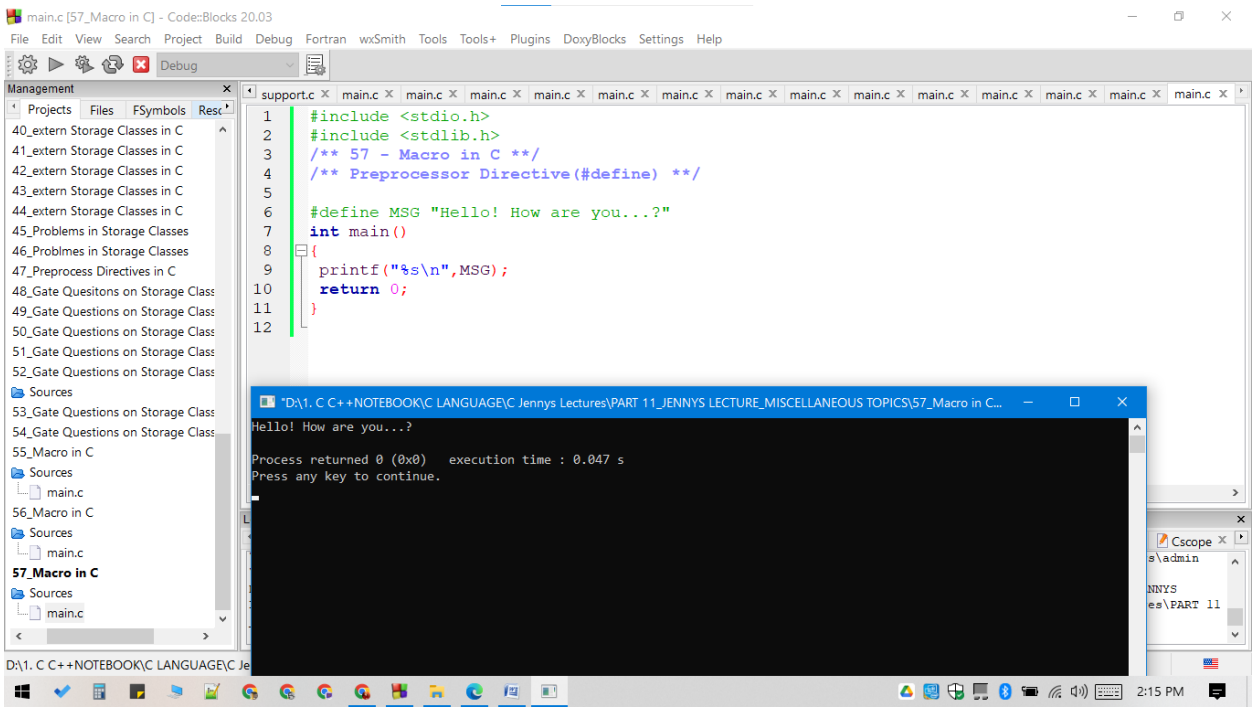
```
int main()
{
    max(5,6);
    # undef MAX → don't put semicolon.
    MAX(11,6); → Error; since we undefined it previously then we cannot access it again; now this is considered as normal function call.
}
```

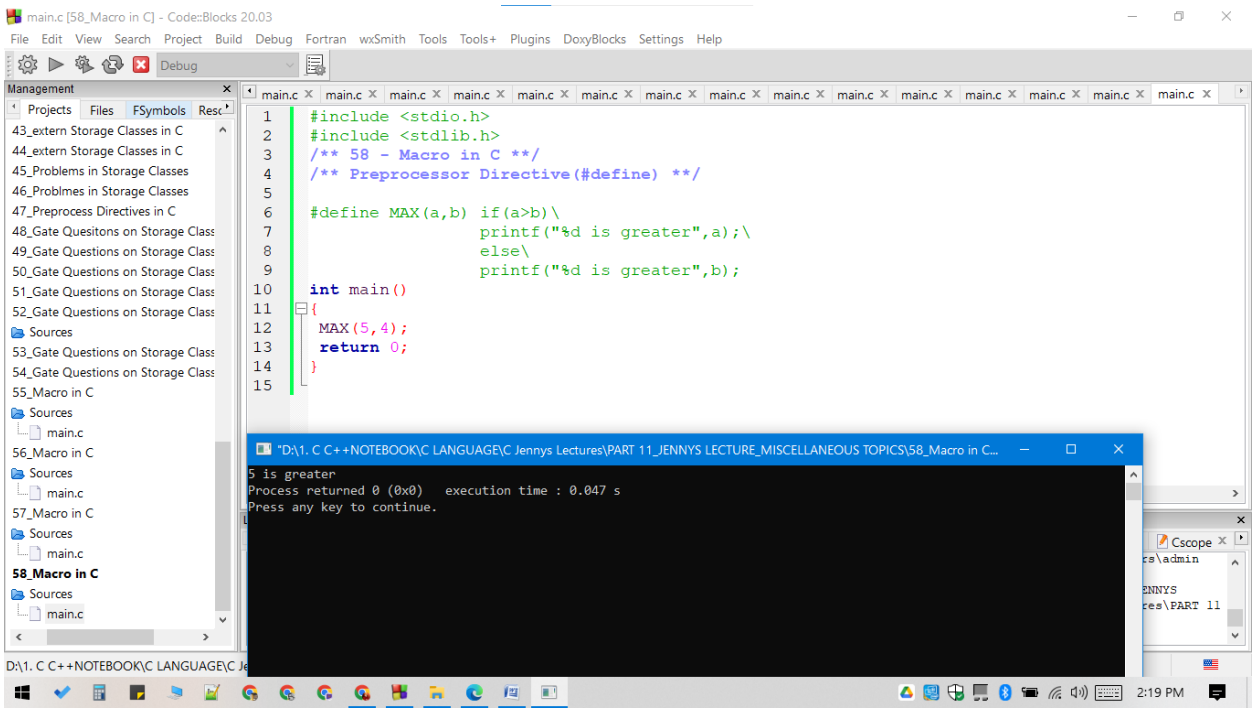
remove and execute.

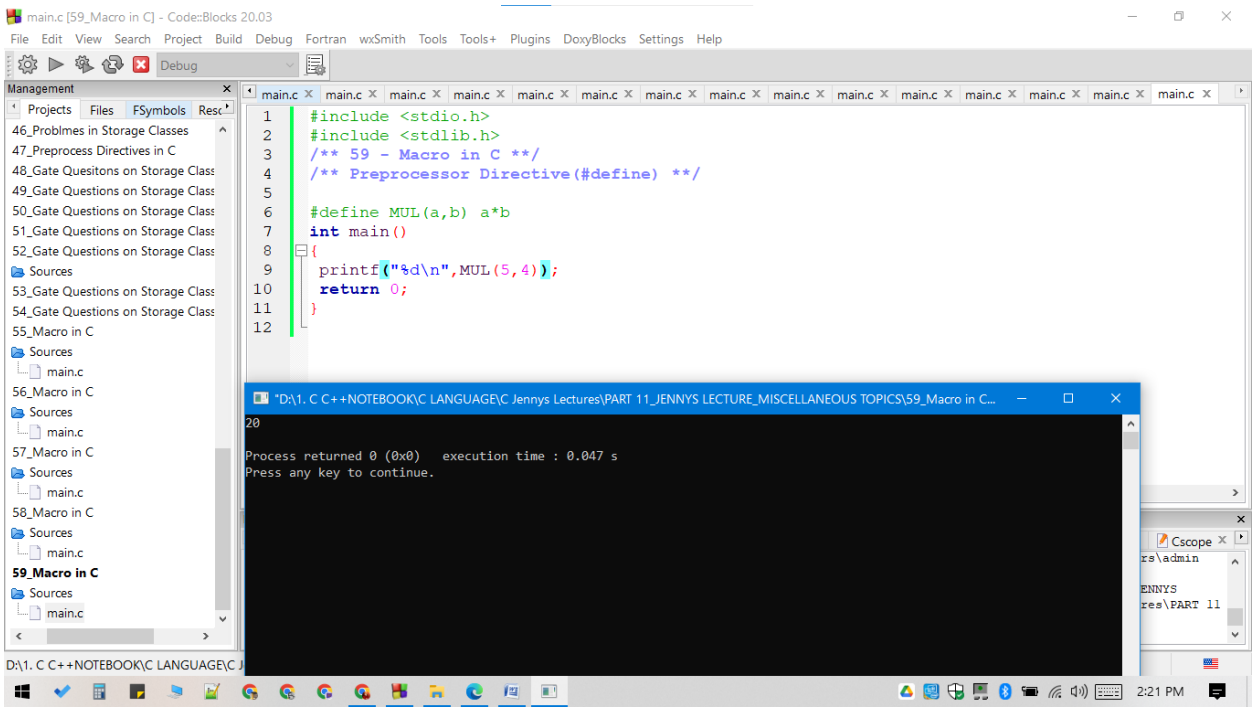
Eg: ⑧ without undefine try using macros Two times

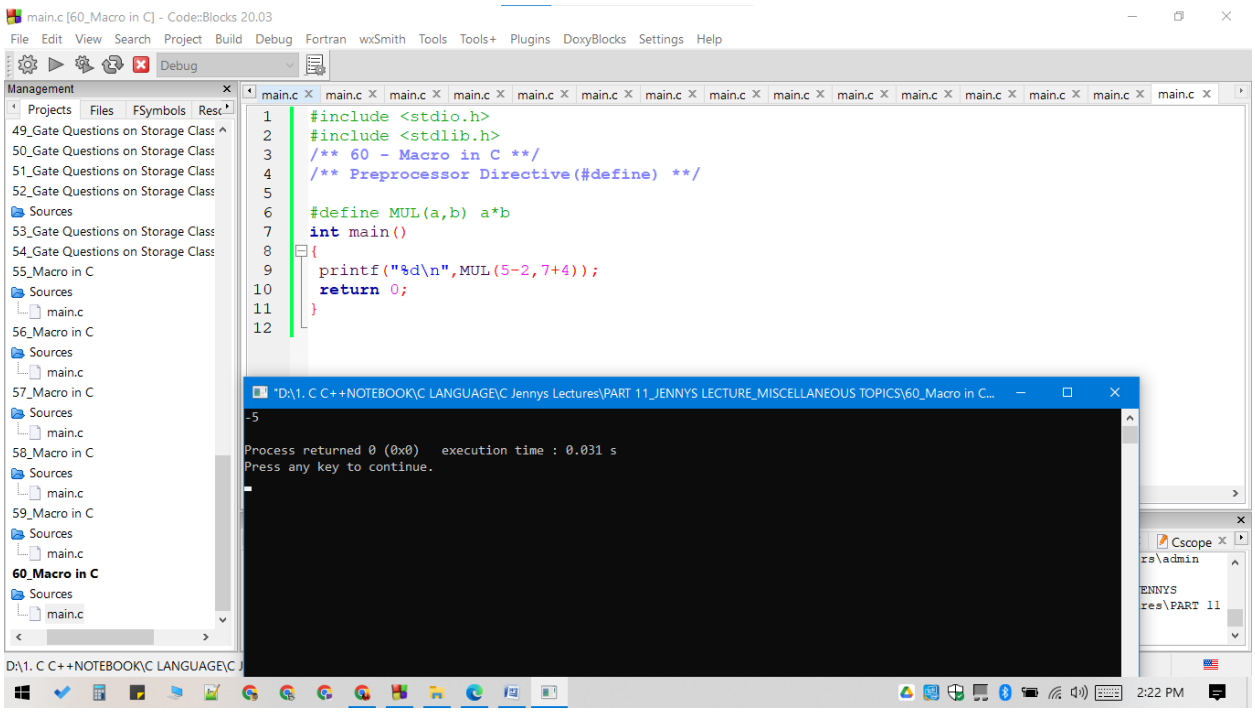

main.c [55_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
34_static Storage Classes in C
35_static Storage Classes in C
36_static Storage Classes in C
37_extern Storage Classes in C
38_extern Storage Classes in C
39_extern Storage Classes in C
40_extern Storage Classes in C
41_extern Storage Classes in C
42_extern Storage Classes in C
43_extern Storage Classes in C
44_extern Storage Classes in C
45_Problems in Storage Classes
46_Problmes in Storage Classes
47_Preprocess Directives in C
48_Gate Quesitons on Storage Class
49_Gate Questions on Storage Class
50_Gate Questions on Storage Class
51_Gate Questions on Storage Class
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
main.c support.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 55 - Macro in C **/
4 /** Preprocessor Directive(#define) **/
5
6 #define A 10
7 int main()
8 {
9 int a=A;
10 printf("a=%d",a);
11 return 0;
12 }
13
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\55_Macro in C...
a=10
Process returned 0 (0x0) execution time : 0.094 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C Je
2:09 PM

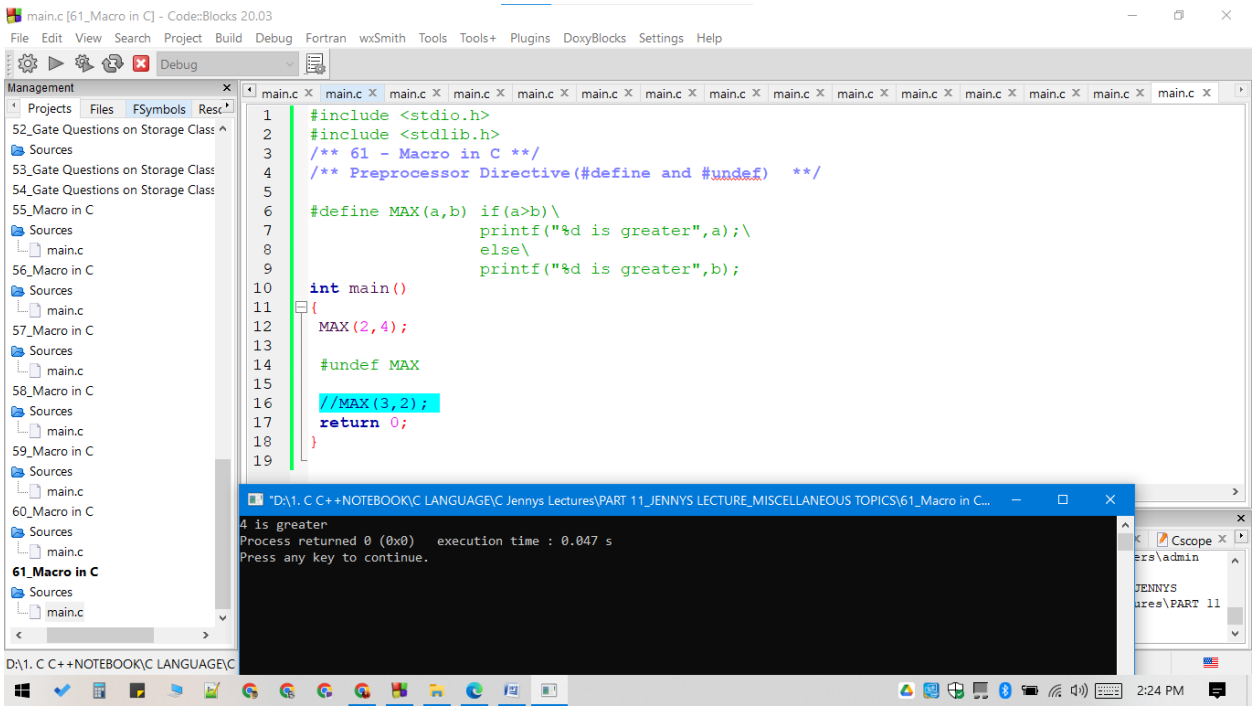

main.c [56_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
37_extern Storage Classes in C
38_extern Storage Classes in C
39_extern Storage Classes in C
40_extern Storage Classes in C
41_extern Storage Classes in C
42_extern Storage Classes in C
43_extern Storage Classes in C
44_extern Storage Classes in C
45_Problems in Storage Classes
46_Problmes in Storage Classes
47_Preprocess Directives in C
48_Gate Quesitons on Storage Class
49_Gate Questions on Storage Class
50_Gate Questions on Storage Class
51_Gate Questions on Storage Class
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
main.c support.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 56 - Macro in C **/
4 /** Preprocessor Directive(#define) **/
5
6 #define PI 3.14159
7 int main()
8 {
9 int r=5;
10 printf("Area of circle is %f\n",PI*r*r);
11 return 0;
12 }
13
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\56_Macro in C...
Area of circle is 78.539750
Process returned 0 (0x0) execution time : 0.031 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C Je
2:11 PM

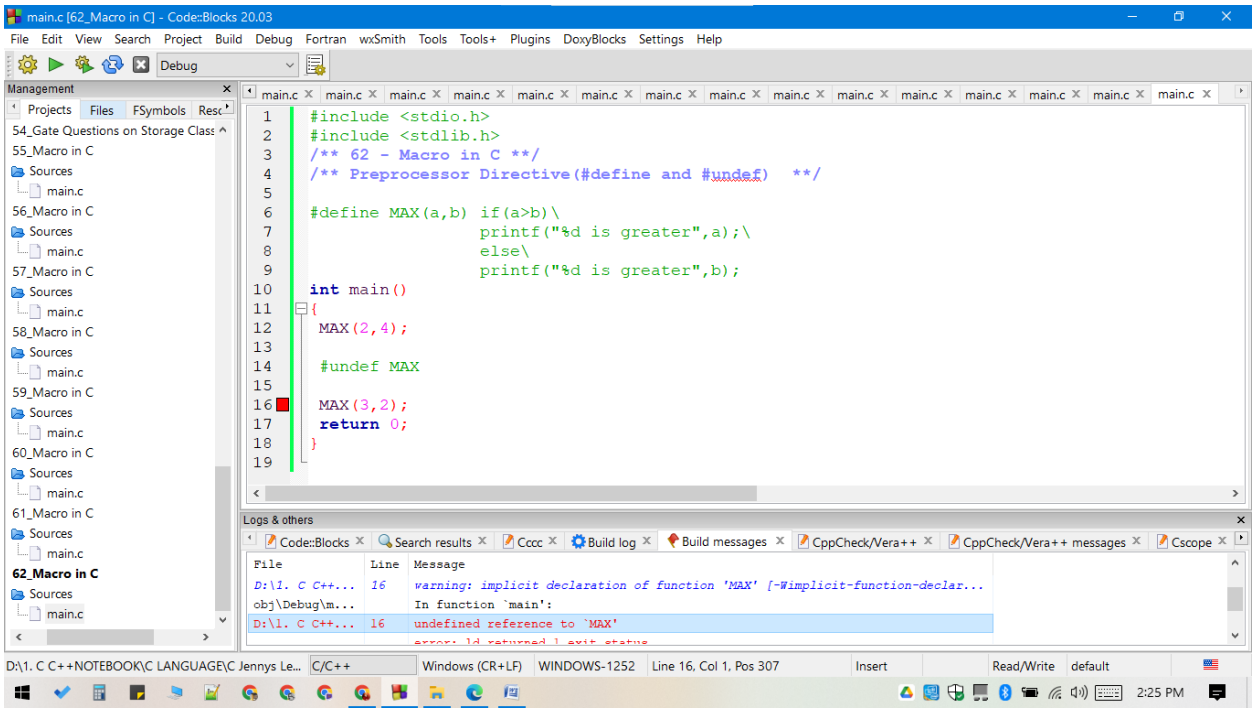

main.c [57_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
40_extern Storage Classes in C
41_extern Storage Classes in C
42_extern Storage Classes in C
43_extern Storage Classes in C
44_extern Storage Classes in C
45_Problems in Storage Classes
46_Problmes in Storage Classes
47_Preprocess Directives in C
48_Gate Quesitons on Storage Class
49_Gate Questions on Storage Class
50_Gate Questions on Storage Class
51_Gate Questions on Storage Class
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
57_Macro in C
Sources
main.c
support.c main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 57 - Macro in C **/
4 /** Preprocessor Directive(#define) **/
5
6 #define MSG "Hello! How are you...?"
7 int main()
8 {
9 printf("%s\n",MSG);
10 return 0;
11 }
12
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\57_Macro in C...
Hello! How are you...?
Process returned 0 (0x0) execution time : 0.047 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C Je
2:15 PM


main.c [58_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
43_extern Storage Classes in C
44_extern Storage Classes in C
45_Problems in Storage Classes
46_Problmes in Storage Classes
47_Preprocess Directives in C
48_Gate Quesitons on Storage Class
49_Gate Questions on Storage Class
50_Gate Questions on Storage Class
51_Gate Questions on Storage Class
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
57_Macro in C
Sources
main.c
58_Macro in C
Sources
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 58 - Macro in C **/
4 /** Preprocessor Directive(#define) **/
5
6 #define MAX(a,b) if(a>b)\
7 printf("%d is greater",a);\
8 else\
9 printf("%d is greater",b);
10 int main()
11 {
12 MAX(5,4);
13 return 0;
14 }
15
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\58_Macro in C...
5 is greater
Process returned 0 (0x0) execution time : 0.047 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C Je
2:19 PM


main.c [59_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
46_Problmes in Storage Classes
47_Preprocess Directives in C
48_Gate Quesitons on Storage Class
49_Gate Questions on Storage Class
50_Gate Questions on Storage Class
51_Gate Questions on Storage Class
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
57_Macro in C
Sources
main.c
58_Macro in C
Sources
main.c
59_Macro in C
Sources
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 59 - Macro in C **/
4 /** Preprocessor Directive(#define) **/
5
6 #define MUL(a,b) a*b
7 int main()
8 {
9 printf("%d\n",MUL(5,4));
10 return 0;
11 }
12
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\59_Macro in C...
20
Process returned 0 (0x0) execution time : 0.047 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C
2:21 PM


main.c [60_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
49_Gate Questions on Storage Class
50_Gate Questions on Storage Class
51_Gate Questions on Storage Class
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
57_Macro in C
Sources
main.c
58_Macro in C
Sources
main.c
59_Macro in C
Sources
main.c
60_Macro in C
Sources
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 60 - Macro in C **/
4 /** Preprocessor Directive(#define) **/
5
6 #define MUL(a,b) a*b
7 int main()
8 {
9 printf("%d\n",MUL(5-2,7+4));
10 return 0;
11 }
12
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\60_Macro in C...
-5
Process returned 0 (0x0) execution time : 0.031 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C
2:22 PM


main.c [61_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
52_Gate Questions on Storage Class
Sources
53_Gate Questions on Storage Class
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
57_Macro in C
Sources
main.c
58_Macro in C
Sources
main.c
59_Macro in C
Sources
main.c
60_Macro in C
Sources
main.c
61_Macro in C
Sources
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 61 - Macro in C **/
4 /** Preprocessor Directive(#define and #undef) **/
5
6 #define MAX(a,b) if(a>b)\
7 printf("%d is greater",a);\
8 else\
9 printf("%d is greater",b);
10 int main()
11 {
12 MAX(2,4);
13
14 #undef MAX
15
16 //MAX(3,2);
17 return 0;
18 }
19
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\61_Macro in C...
4 is greater
Process returned 0 (0x0) execution time : 0.047 s
Press any key to continue.
Cscope
D:\1. C C++NOTEBOOK\C LANGUAGE\C
2:24 PM


main.c [62_Macro in C] - Code::Blocks 20.03
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help
Debug
Management
Projects Files FSymbols
54_Gate Questions on Storage Class
55_Macro in C
Sources
main.c
56_Macro in C
Sources
main.c
57_Macro in C
Sources
main.c
58_Macro in C
Sources
main.c
59_Macro in C
Sources
main.c
60_Macro in C
Sources
main.c
61_Macro in C
Sources
main.c
62_Macro in C
Sources
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 62 - Macro in C **/
4 /** Preprocessor Directive(#define and #undef) **/
5
6 #define MAX(a,b) if(a>b)\
7 printf("%d is greater",a);\
8 else\
9 printf("%d is greater",b);
10 int main()
11 {
12 MAX(2,4);
13
14 #undef MAX
15
16 MAX(3,2);
17 return 0;
18 }
19
Logs & others
Code::Blocks Search results Cccc Build log Build messages CppCheck/Vera++ CppCheck/Vera++ messages Cscope
File Line Message
D:\1. C C++... 16 warning: implicit declaration of function 'MAX' [-Wimplicit-function-declar...
obj\Debug\m... In function `main':
D:\1. C C++... 16 undefined reference to `MAX'
D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Le... C/C++ Windows (CR+LF) WINDOWS-1252 Line 16, Col 1, Pos 307 Insert Read/Write default
2:25 PM