

C-140 ⇒ Storage classes in C

int a = 10;
↓ ↓
data type value
↓
variable name

* Variable is basically associated with two things,

↳ Type

↳ Storage class

* If variable is initialized; like int a;
then it is associated with things like,
int a;

These things tell by storage class.

- ↳ Default value
- ↳ What is the location [register/RAM/main memory]
- ↳ Scope (where we can access)
- ↳ Lifetime (till when this variable is alive).

* We write storage class before the type.
↳ storage class int a;

NOTE:

* If we don't write any storage class before type; then compiler will consider it as a default storage class 'auto'.

(or) we can also write auto before type.

↳ auto int a; ✓

Default Value:

* If we don't initialize then sometimes we have zero as default value or sometimes we have garbage value.

Location:

* Location means in which place we store the variable (i.e) in register or RAM or main memory.

Scope:

* It means from where we can access the variable.

* A variable can have 3 types of scope and it depends on which storage class we use.

- Block
- Function/Method
- Program.

Block scope :- If we put inside curly braces then it comes under block scope.

Eg. {

block;

}

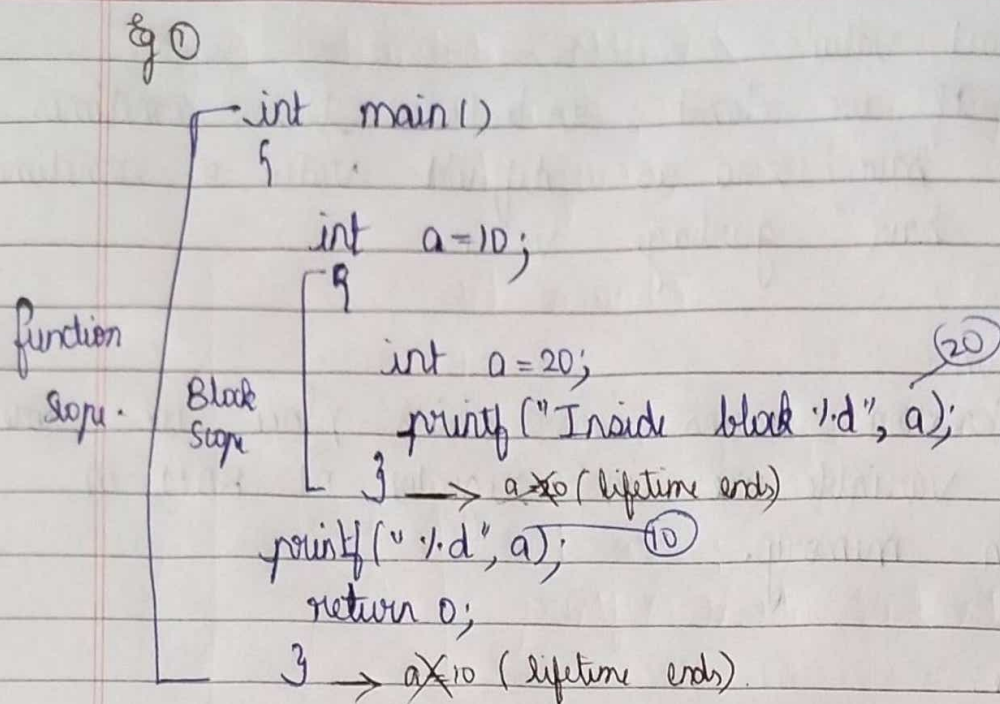
→ We can define our block anywhere in our program

Function Scope :- If we put inside any function then it comes under function/method scope.

Eg. void function()

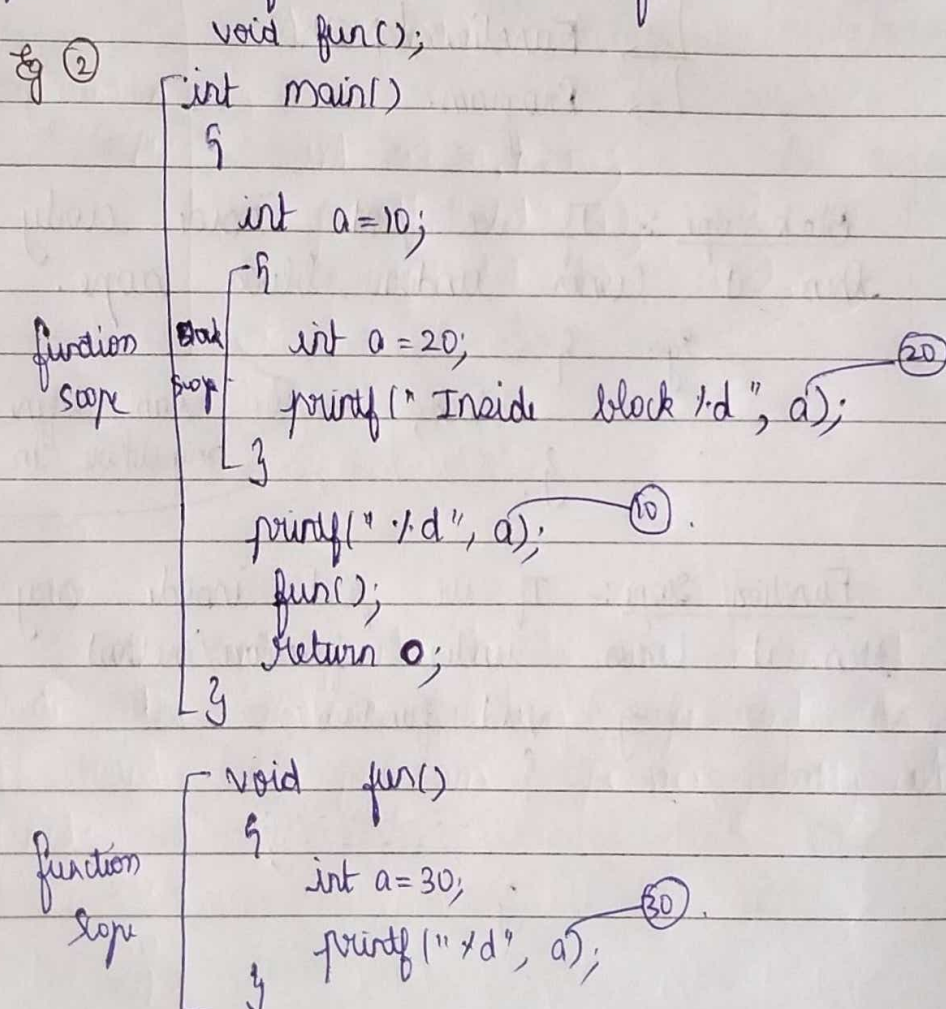
{

}

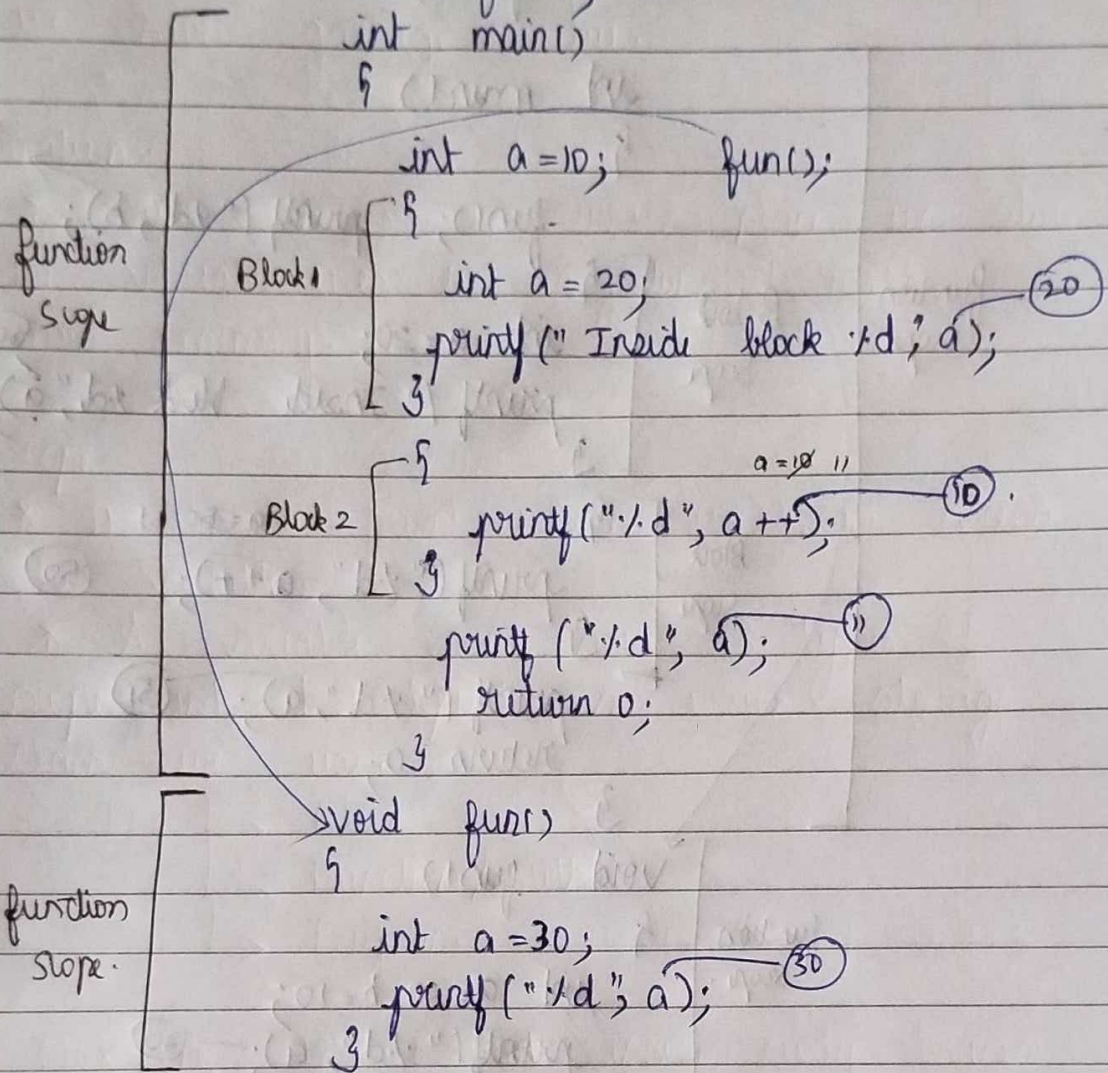


* We can access `a=20`; only within block scope and after that its life time is dead.

* We can access `a=10`; within the function scope and after that its life time is dead.



eg ③ # include <stdio.h>
int a = 50; → Program scope/global
void fun();
int main()

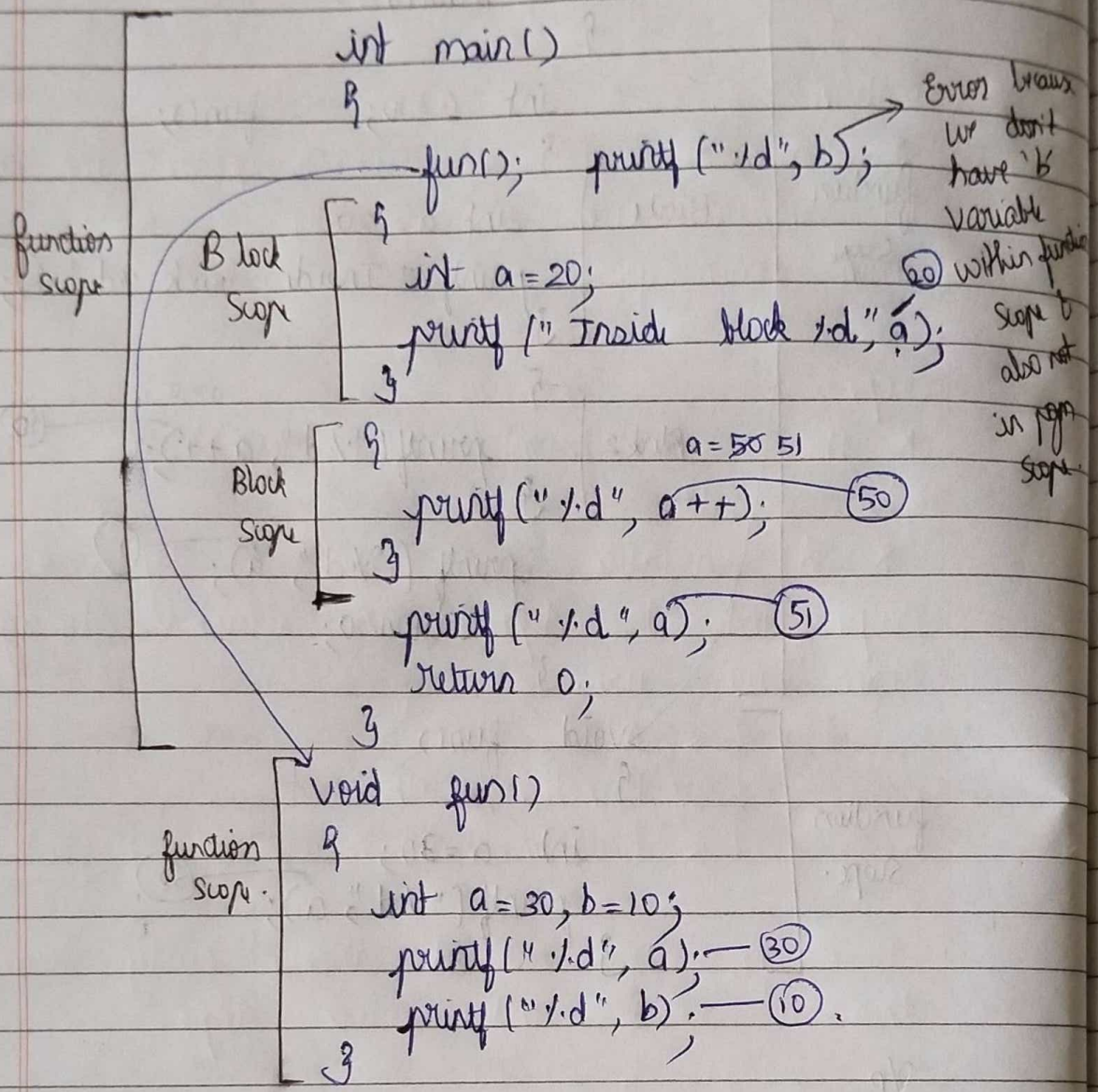


Q/p

30
Inside block 20
10
11

* Here we defined global variable and it has program scope but we have not used it in this program.

eg ④ #include <stdio.h>
int a=50; → program scope.
void fun();



Q/p

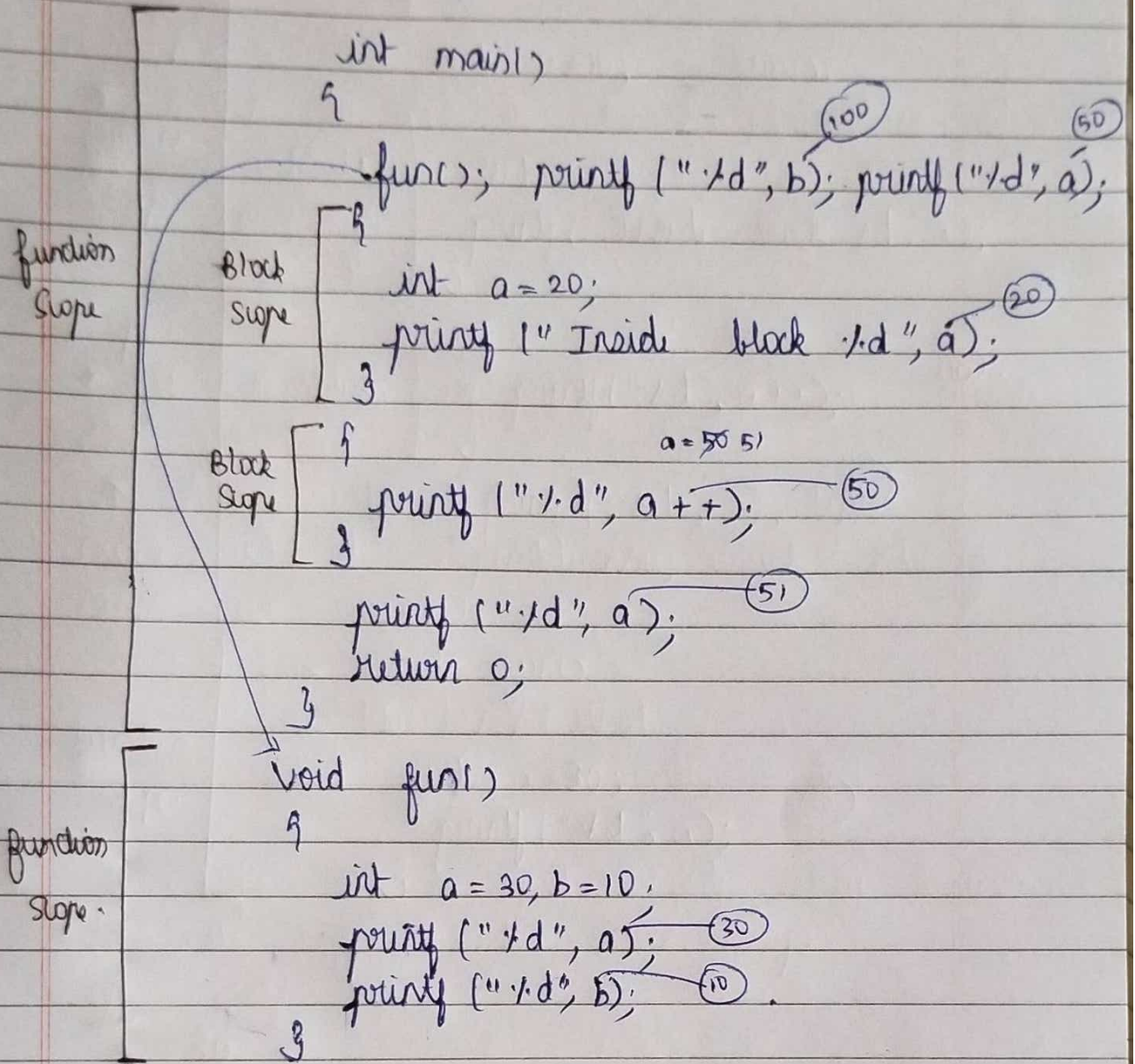
30
10

Error; can't print 'b' because b is not defined inside the main() function scope and also not found in program scope (ie) globally not defined.

20
50
51

eg ⑤ #include <stdio.h>

int a = 50;
int b = 100; } → program scope/global.
void func();



o/p

30

10

100

50

20

50

51

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 22 - Storage Classes in C */
4 /** Scope and lifetime of variables */
5 /** no storage classes mentioned will be considered by default as auto storage class */
6
7 int main()
8 {
9     int a=10;
10    {
11        int a=20;
12        printf("Inside block a=%d\n",a);
13    }
14    printf("Outside the block & within the main a=%d\n",a);
15    return 0;
16 }
```

The IDE interface shows a project named '22_Storage Classes in C' with a source file 'main.c'. The status bar indicates 'Line 3, Col 7, Pos 47'.

```
Inside block a=20
Outside the block & within the main a=10

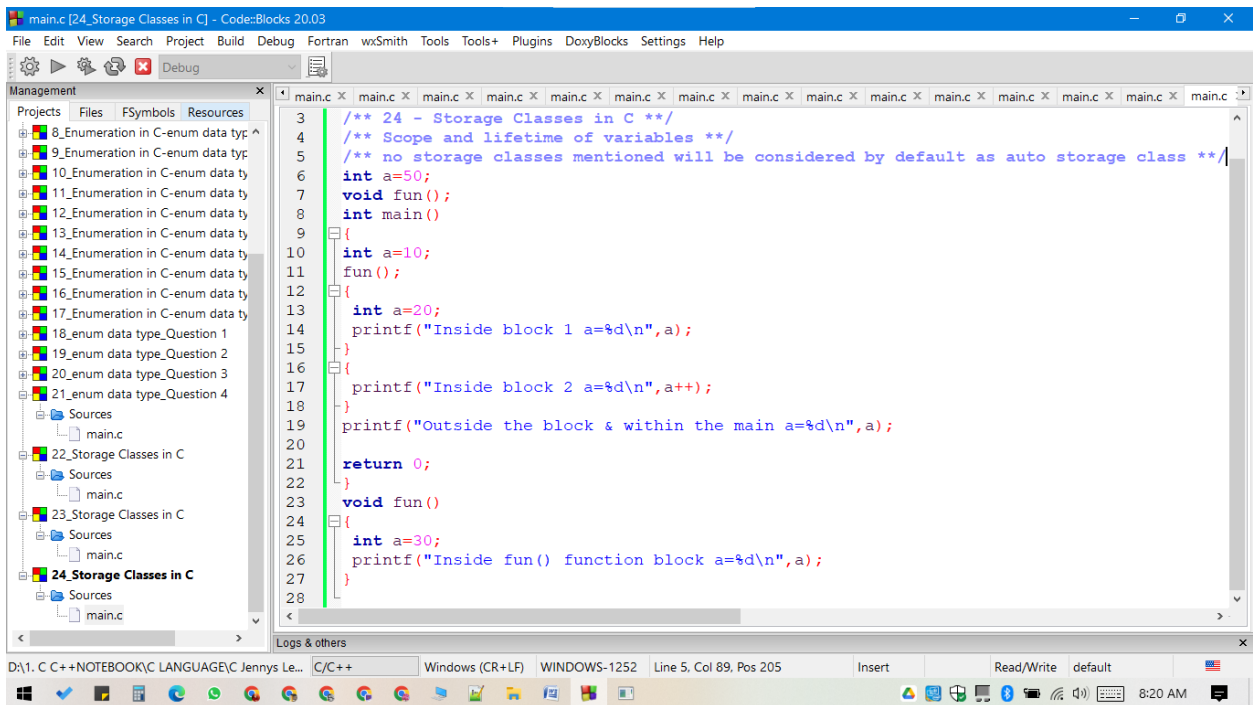
Process returned 0 (0x0)   execution time : 0.202 s
Press any key to continue.
```

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 23 - Storage Classes in C */
4 /** Scope and lifetime of variables */
5 /** no storage classes mentioned will be considered by default as auto storage class */
6
7 void fun();
8 int main()
9 {
10    int a=10;
11    {
12        int a=20;
13        printf("Inside block a=%d\n",a);
14    }
15    printf("Outside the block & within the main a=%d\n",a);
16    fun();
17    return 0;
18 }
19 void fun()
20 {
21     int a=30;
22     printf("Inside fun() function block a=%d\n",a);
23 }
24
```

The IDE interface shows a project named '23_Storage Classes in C' with a source file 'main.c'. The status bar indicates 'Line 22, Col 49, Pos 455'.

```
"D:\1. C C++\NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNY'S LECTURE_MISCELLANEOUS TOPICS\23_Storage Cl...
Inside block a=20
Outside the block & within the main a=10
Inside fun() function block a=30

Process returned 0 (0x0)   execution time : 0.070 s
Press any key to continue.
```



```
"D:\1. C C++\NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNY'S LECTURE_MISCELLANEOUS TOPICS\24_Storage Cl...
Inside fun() function block a=30
Inside block 1 a=20
Inside block 2 a=10
Outside the block & within the main a=11

Process returned 0 (0x0)   execution time : 0.044 s
Press any key to continue.
```


main.c [25_Storage Classes in C] - Code::Blocks 20.03

File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help

Management

Projects Files FSymbols Resources

11_Enumeration in C-enum data ty
12_Enumeration in C-enum data ty
13_Enumeration in C-enum data ty
14_Enumeration in C-enum data ty
15_Enumeration in C-enum data ty
16_Enumeration in C-enum data ty
17_Enumeration in C-enum data ty
18_enum data type_Question 1
19_enum data type_Question 2
20_enum data type_Question 3
21_enum data type_Question 4
Sources
main.c
22_Storage Classes in C
Sources
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23_Storage Classes in C
Sources
main.c
24_Storage Classes in C
Sources
main.c
25_Storage Classes in C
Sources
main.c

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 25 - Storage Classes in C **/
4 /** Scope and lifetime of variables **/
5 /** no storage classes mentioned will be considered by default as auto storage class **/
6 int a=50;
7 void fun();
8 int main()
9 {
10     fun();
11     printf("Inside main b=%d\n",b);
12 }
13     int a=20;
14     printf("Inside block 1 a=%d\n",a);
15 }
16 {
17     printf("Inside block 2 a=%d\n",a++);
18 }
19     printf("Outside the block & within the main a=%d\n",a);
20
21     return 0;
```

Logs & others

Code::Blocks Search results Cccc Build log Build messages CppCheck/Vera++ CppCheck/Vera++ messages Cscop

File	Line	Message
D:\1. C C++...		In function 'main':
D:\1. C C++...	11	error: 'b' undeclared (first use in this function)

D:\1. C C+++NOTEBOOK\C LANGUAGE\C Jennys Le... C/C++ Windows (CR+LF) WINDOWS-1252 Line 11, Col 1, Pos 254 Insert Read/Write default 8:24 AM

main.c [25_Storage Classes in C] - Code::Blocks 20.03

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Projects Files FSymbols Resources

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20_enum data type_Question 3
21_enum data type_Question 4
Sources
main.c
22_Storage Classes in C
Sources
main.c
23_Storage Classes in C
Sources
main.c
24_Storage Classes in C
Sources
main.c
25_Storage Classes in C
Sources
main.c

```
9 {
10     fun();
11     printf("Inside main b=%d\n",b);
12 }
13     int a=20;
14     printf("Inside block 1 a=%d\n",a);
15 }
16 {
17     printf("Inside block 2 a=%d\n",a++);
18 }
19     printf("Outside the block & within the main a=%d\n",a);
20
21     return 0;
22 }
23 void fun()
24 {
25     int a=30,b=10;
26     printf("Inside fun() function block a=%d\n",a);
27     printf("Inside fun() function block b=%d\n",b);
28 }
29
```

Logs & others

Code::Blocks Search results Cccc Build log Build messages CppCheck/Vera++ CppCheck/Vera++ messages Cscop

File	Line	Message
D:\1. C C++...		In function 'main':
D:\1. C C++...	11	error: 'b' undeclared (first use in this function)

D:\1. C C+++NOTEBOOK\C LANGUAGE\C Jennys Le... C/C++ Windows (CR+LF) WINDOWS-1252 Line 11, Col 1, Pos 254 Insert Read/Write default 8:24 AM

main.c [25_Storage Classes in C] - Code::Blocks 20.03

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Sources
main.c
22_Storage Classes in C
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23_Storage Classes in C
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24_Storage Classes in C
Sources
main.c
25_Storage Classes in C
Sources
main.c

```
1 #include <stdio.h>
2 #include <stdlib.h>
3 /** 25 - Storage Classes in C **/
4 /** Scope and lifetime of variables **/
5 /** no storage classes mentioned will be considered by default as auto storage class **/
6 int a=50;
7 void fun();
8 int main()
9 {
10     fun();
11     //printf("Inside main b=%d\n",b);
12 }
13     int a=20;
14     printf("Inside block 1 a=%d\n",a);
15 }
16 {
17     printf("Inside block 2 a=%d\n",a++);
18 }
19     printf("Outside the block & within the main a=%d\n",a);
20
21     return 0;
```

Logs & others

Code::Blocks Search results Cccc Build log Build messages CppCheck/Vera++ CppCheck/Vera++ messages Cscop

Process terminated with status 0 (0 minute(s), 0 second(s))
0 error(s), 0 warning(s) (0 minute(s), 0 second(s))

D:\1. C C++\NOTEBOOK\C LANGUAGE\C Jennys Le... C/C++ Windows (CR+LF) WINDOWS-1252 Line 11, Col 3, Pos 256 Insert Read/Write default 8:25 AM

main.c [25_Storage Classes in C] - Code::Blocks 20.03

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Management

Projects Files FSymbols Resources

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16_Enumeration in C-enun data ty
17_Enumeration in C-enun data ty
18_enun data type_Question 1
19_enun data type_Question 2
20_enun data type_Question 3
21_enun data type_Question 4
Sources
main.c
22_Storage Classes in C
Sources
main.c
23_Storage Classes in C
Sources
main.c
24_Storage Classes in C
Sources
main.c
25_Storage Classes in C
Sources
main.c

```
9 {
10     fun();
11     //printf("Inside main b=%d\n",b);
12 }
13     int a=20;
14     printf("Inside block 1 a=%d\n",a);
15 }
16 {
17     printf("Inside block 2 a=%d\n",a++);
18 }
19     printf("Outside the block & within the main a=%d\n",a);
20
21     return 0;
22 }
23 void fun()
24 {
25     int a=30,b=10;
26     printf("Inside fun() function block a=%d\n",a);
27     printf("Inside fun() function block b=%d\n",b);
28 }
29
```

Logs & others

Code::Blocks Search results Cccc Build log Build messages CppCheck/Vera++ CppCheck/Vera++ messages Cscop

Process terminated with status 0 (0 minute(s), 0 second(s))
0 error(s), 0 warning(s) (0 minute(s), 0 second(s))

D:\1. C C++\NOTEBOOK\C LANGUAGE\C Jennys Le... C/C++ Windows (CR+LF) WINDOWS-1252 Line 11, Col 3, Pos 256 Insert Read/Write default 8:25 AM


```
"D:\1. C C++NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\25_Storage Cl...
Inside fun() function block a=30
Inside fun() function block b=10
Inside block 1 a=20
Inside block 2 a=50
Outside the block & within the main a=51

Process returned 0 (0x0)   execution time : 0.044 s
Press any key to continue.
```

```
main.c [26_Storage Classes in C] - Code::Blocks 20.03
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Management
Projects Files FSymbols Resources
14_Enumeration in C-enum data ty
15_Enumeration in C-enum data ty
16_Enumeration in C-enum data ty
17_Enumeration in C-enum data ty
18_enum data type_Question 1
19_enum data type_Question 2
20_enum data type_Question 3
21_enum data type_Question 4
Sources
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22_Storage Classes in C
Sources
main.c
23_Storage Classes in C
Sources
main.c
24_Storage Classes in C
Sources
main.c
25_Storage Classes in C
Sources
main.c
26_Storage Classes in C
Sources
main.c
1
#include <stdio.h>
2
#include <stdlib.h>
3
/** 26 - Storage Classes in C */
4
/** Scope and lifetime of variables */
5
/** no storage classes mentioned will be considered by default as auto storage class */
6
int a=50, b=100;
7
void fun();
8
int main()
9
{
10
fun();
11
printf("Inside main a=%d\n",a);
12
printf("Inside main b=%d\n",b);
13
{
14
int a=20;
15
printf("Inside block 1 a=%d\n",a);
16
}
17
{
18
printf("Inside block 2 a=%d\n",a++);
19
}
20
printf("Outside the block & within the main a=%d\n",a);
21
return 0;
22
}
23
void fun()
24
{
25
}
```

The screenshot shows the Code::Blocks 20.03 IDE with a project named "26_Storage Classes in C". The left sidebar displays a file explorer with a tree structure of projects and source files. The main editor window shows the following C code:

```
6  int a=50, b=100;
7  void fun();
8  int main()
9  {
10     fun();
11     printf("Inside main a=%d\n",a);
12     printf("Inside main b=%d\n",b);
13 }
14     int a=20;
15     printf("Inside block 1 a=%d\n",a);
16 }
17 {
18     printf("Inside block 2 a=%d\n",a++);
19 }
20     printf("Outside the block & within the main a=%d\n",a);
21
22     return 0;
23 }
24 void fun()
25 {
26     int a=30,b=10;
27     printf("Inside fun() function block a=%d\n",a);
28     printf("Inside fun() function block b=%d\n",b);
29 }
30
```

The status bar at the bottom indicates the current position is Line 11, Col 30, Pos 290.

The screenshot shows a terminal window titled "D:\1. C C++\NOTEBOOK\C LANGUAGE\C Jennys Lectures\PART 11_JENNYS LECTURE_MISCELLANEOUS TOPICS\26_Storage Cl...". The output of the program is as follows:

```
Inside fun() function block a=30
Inside fun() function block b=10
Inside main a=50
Inside main b=100
Inside block 1 a=20
Inside block 2 a=50
Outside the block & within the main a=51

Process returned 0 (0x0)   execution time : 0.047 s
Press any key to continue.
```