



# Programming and Data Structures Lab (CS19003) Section 1

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# Teaching Assistants

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# Class Rules

- Class Timings: Wednesday (2:00 PM to 5:00 PM)
- Venue: [MS Teams](#)
- Course Website: [PDS Lab Section 1](#)
- All assignments to be done in the lab and submitted before the lab concludes.
- Any attempts to copy will involve severe penalties
  - 0 for the assignment copied for BOTH the person copying and the person copied from.
  - **Any repeat offense will result in deregistration from the course.**
- Marks Distribution:
  - Three tests ( **40%** )
  - Regular Assignments ( **40%** )
  - Vivas ( **20%** ) -- Interactions with TAs, Teacher [3 times after 3 tests]

# Computing Environment

- Operating System:
  - **Ubuntu**
  - **Windows**
- Text editor: **Codeblocks**  
For typing in your C program
- C language compiler: **gcc**  
For compiling the C program

# Assignment Submission

- IIT Kgp Moodle:  
Link : (<http://kgpmoodlenew.iitkgp.ac.in/moodle/>)
- Login to your account.  
**If you do not have an account let us know immediately.**
- Go to:  
Spring Semester-2021  Computer Science  PDS Lab, Section 1 (CS19003)
- **Enroll if you haven't already.**
- Under Topic-1, click on Assignment\_1
- Download test.c

# Some Basics

- Your programs will be stored in **files** (\*.c files)
- Files are stored in **directories** (**folders** in Windows)
- Directories will contain other **subdirectories** and **files**
- You may create a separate subdirectory for each of your assignments so that you can find them easily
- But this is not a requirement for this lab, so if you want, just keep all your files in the same directory

# Some Useful Linux Commands

**pwd** – shows the current directory you are in

**ls** – shows the contents (Files and subdirectories) of the current directory

**mkdir X** – creates a subdirectory named **X** under the current directory

**cd X** – changes the current directory to the directory named **X** under it

**cd ..** – go back to the previous directory

**mv <source> <destination>** – renames a file

**cp <source> <dectination>** – copies the content of <source> to <destination>

# Creating a Practice Directory

On the \$ prompt, type **mkdir practice**

Type **ls** to verify that the new directory is created

Change to the new directory: type **cd practice**

Type **pwd** to verify that you are in the new directory

We will now use this directory to store our practice files



# Introduction to Codeblocks

A free C/C++ and Fortran IDE (Integrated Development Environment).

- Download Codeblocks

- **Windows:**

- Link: [click here](#)

- **Ubuntu**(Open Terminal and Run the following commands):

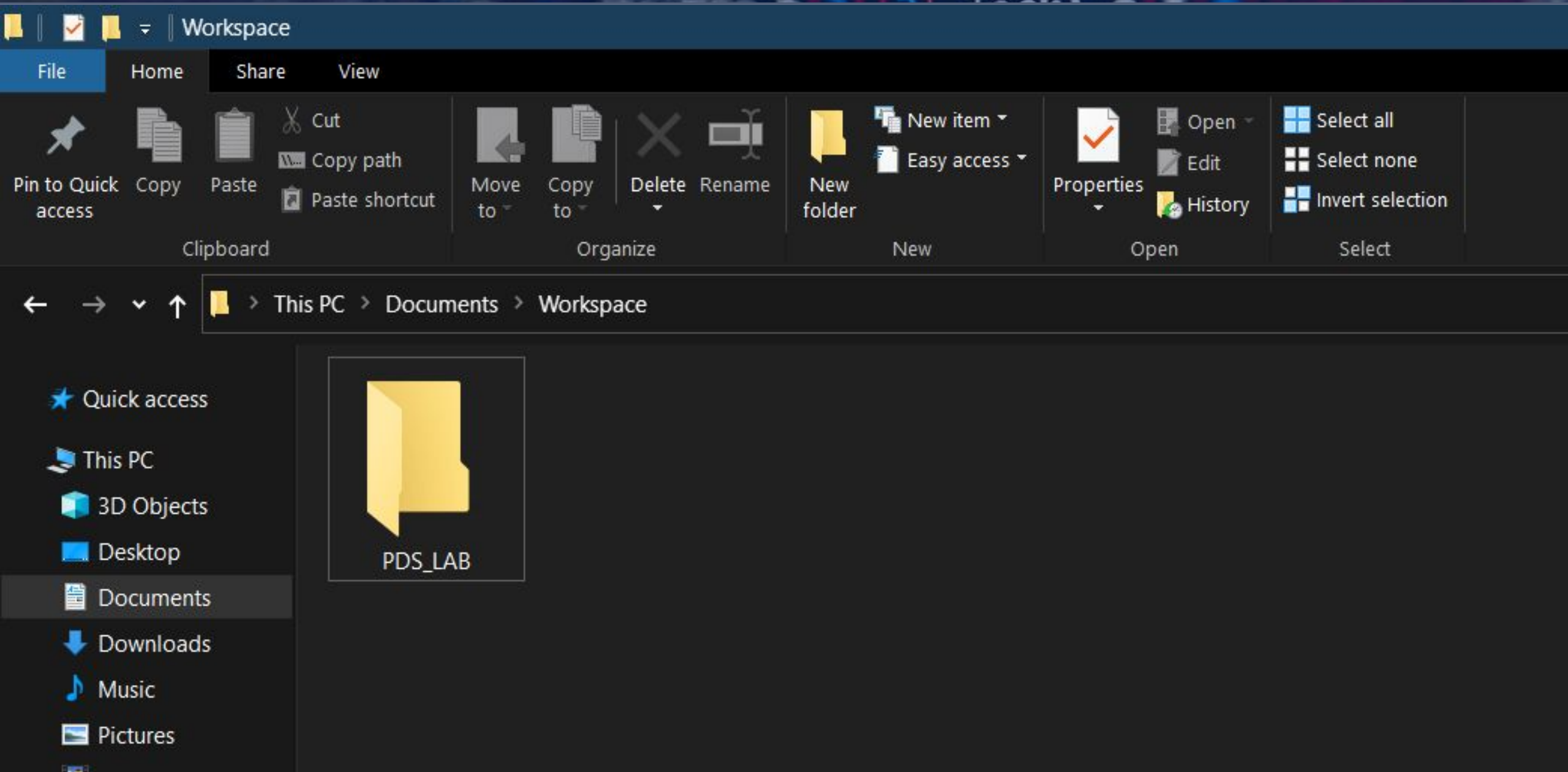
- `sudo apt-get install build-essential`

- `sudo apt-get install gcc`

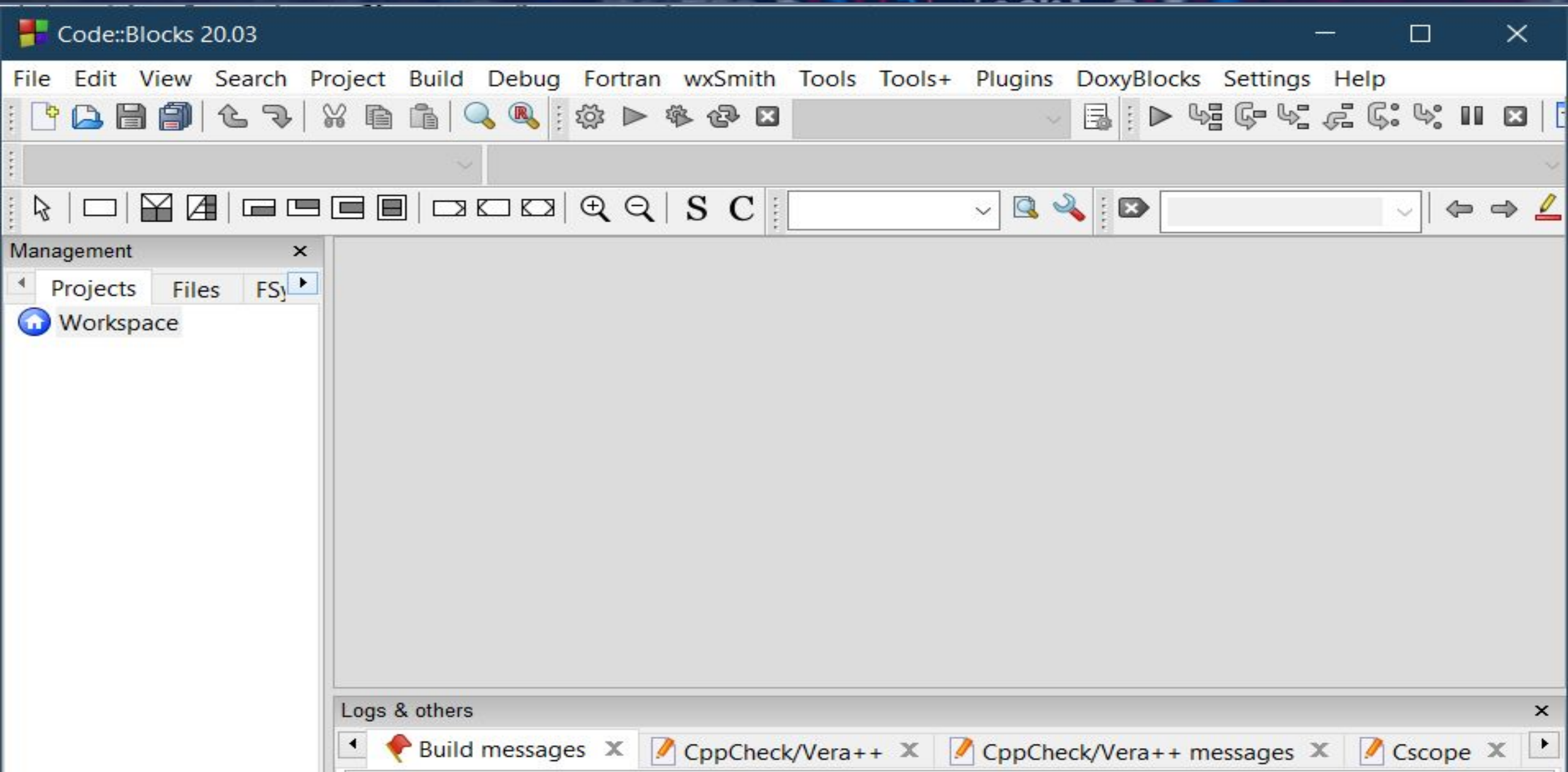
- `sudo apt-get install gdb`

- `sudo apt-get install codeblocks`

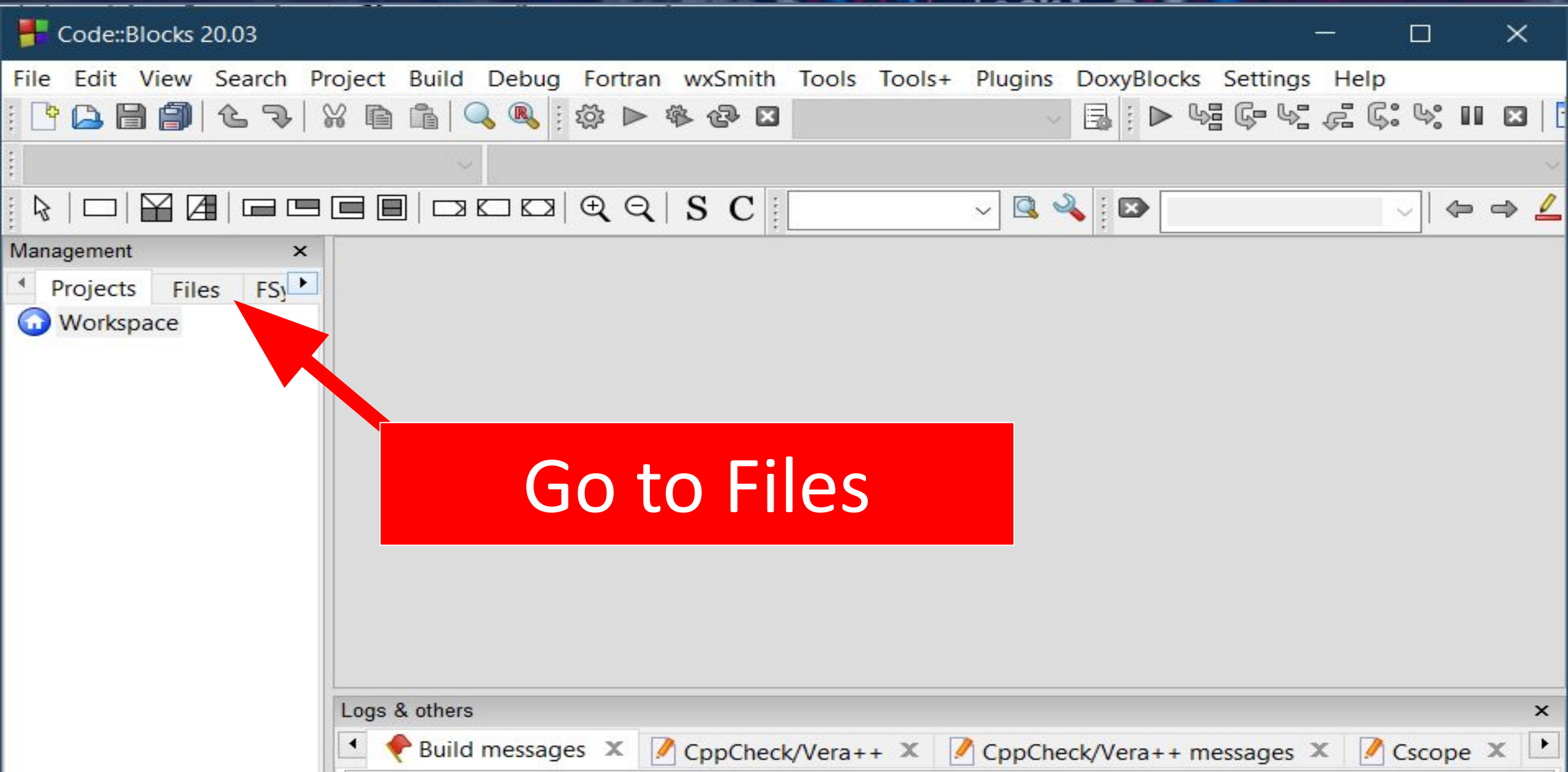
# Create a Folder/Directory



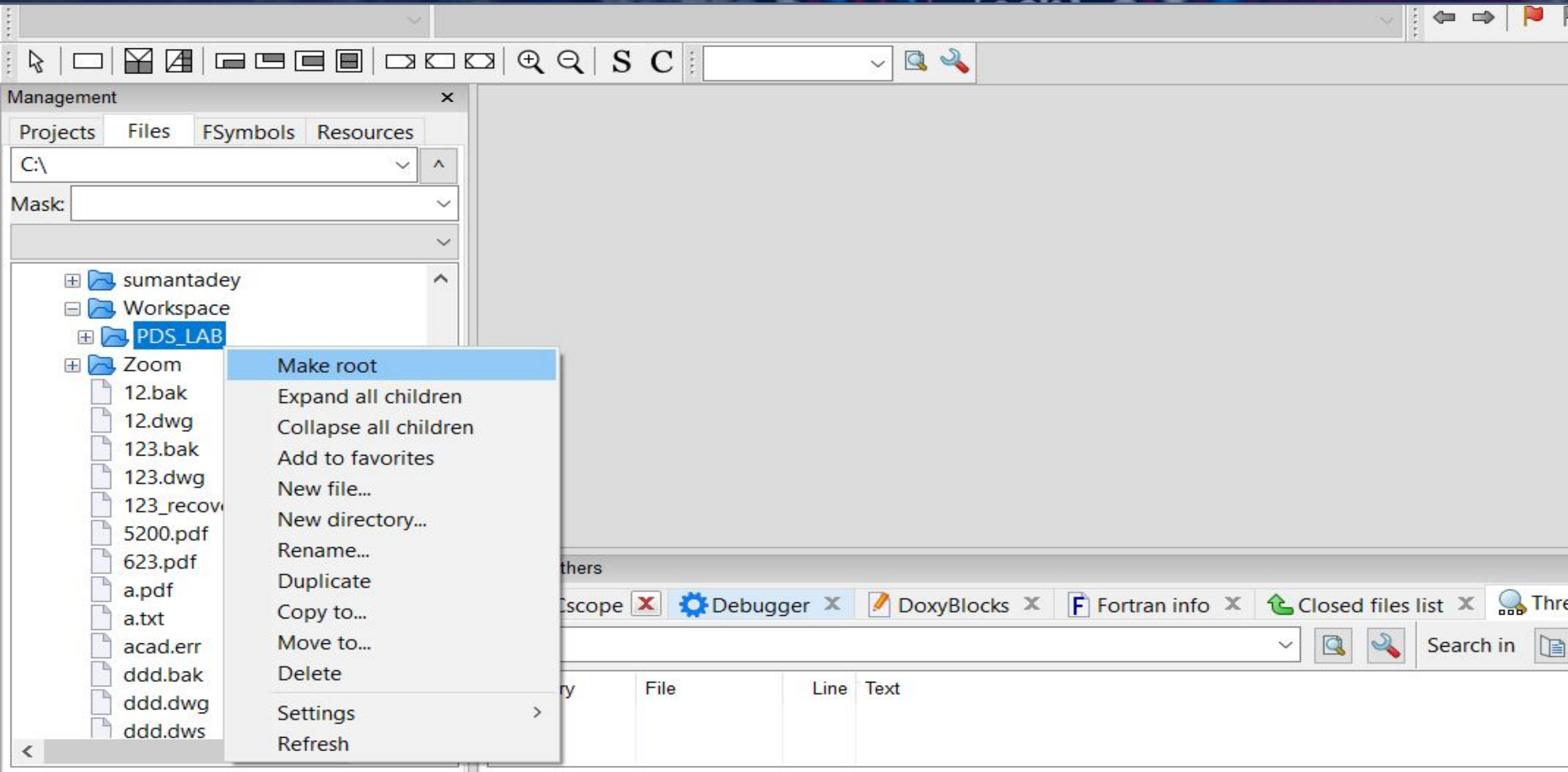
# Open Codeblocks



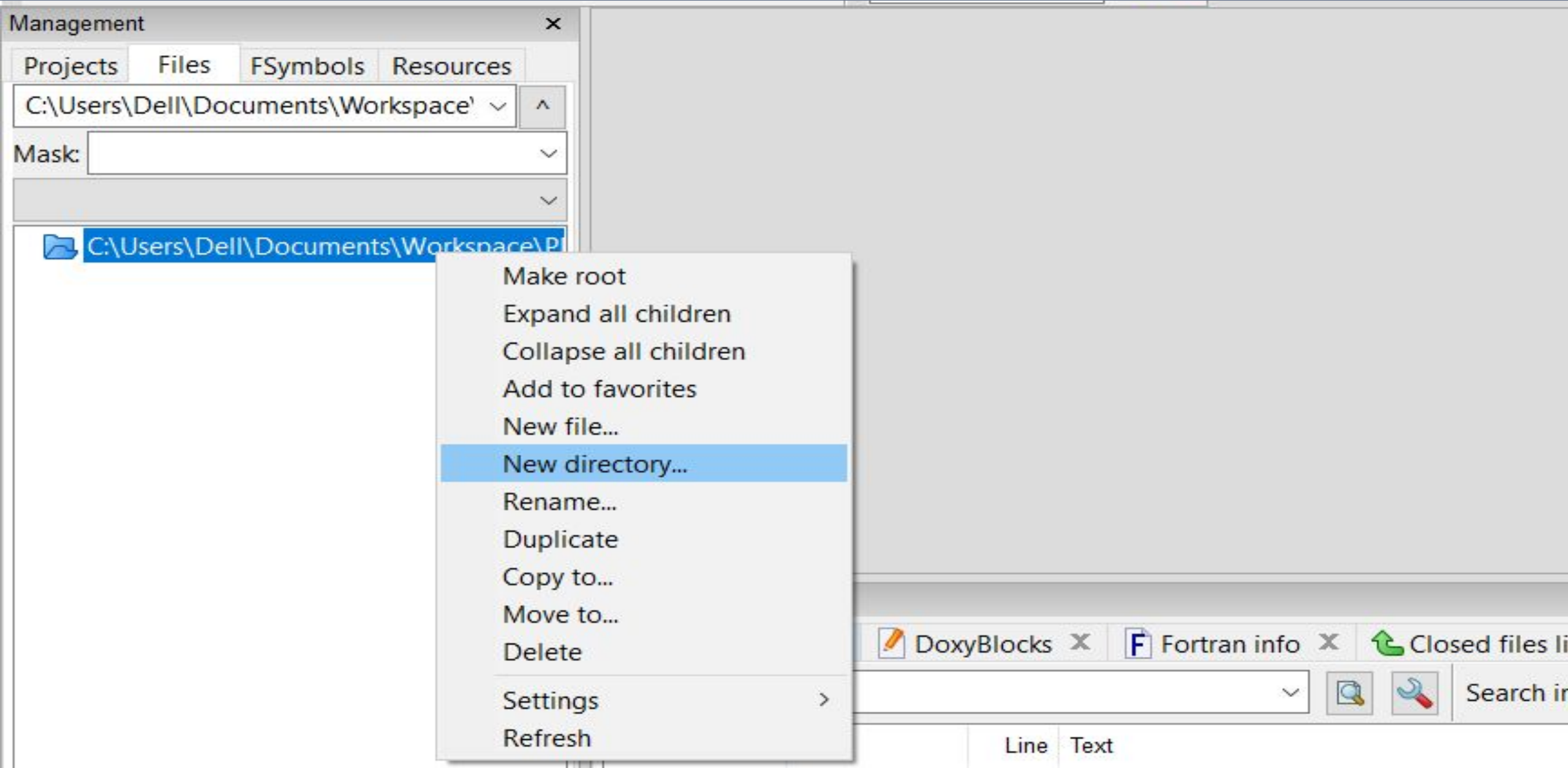
# Go to Files



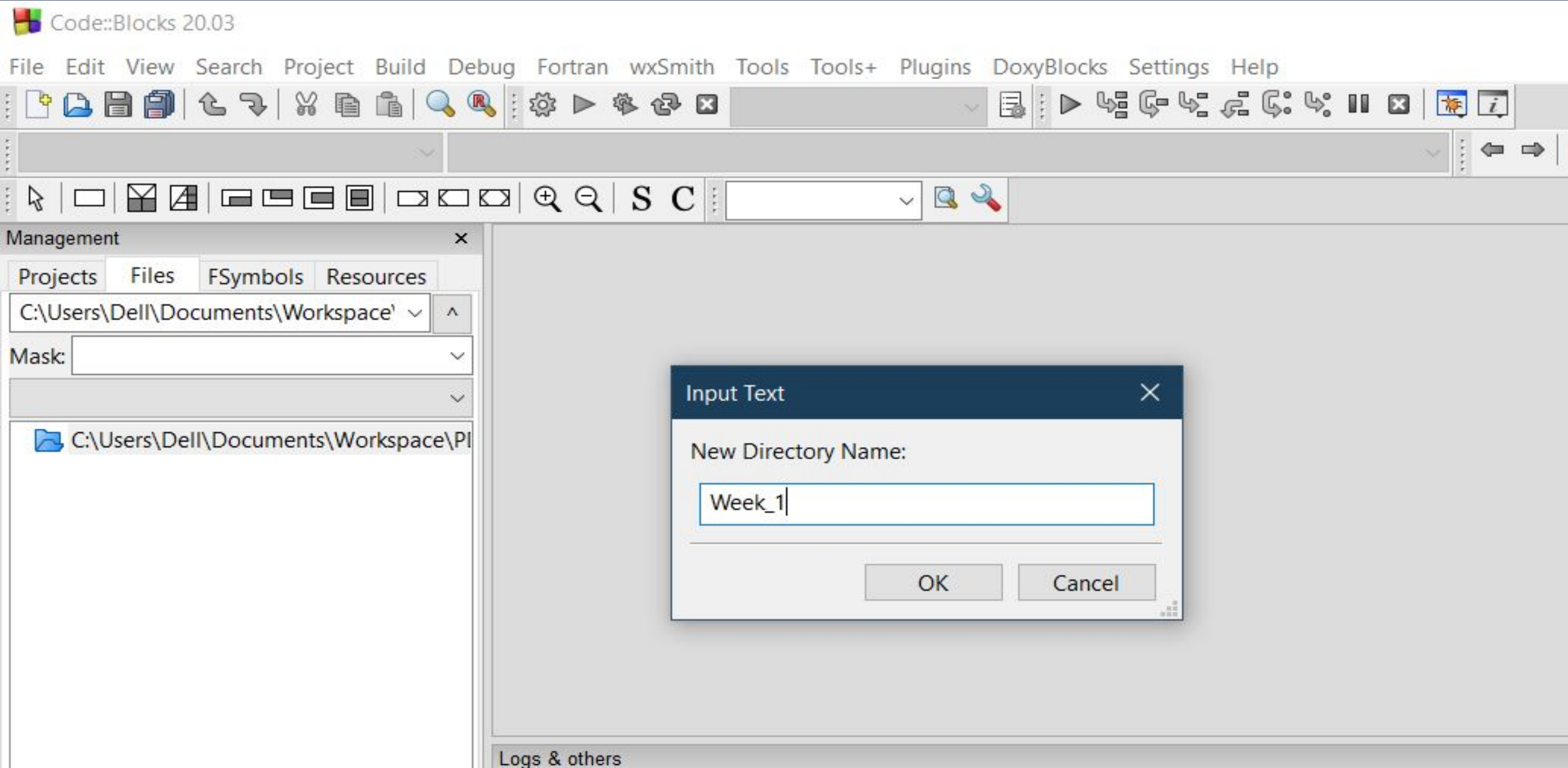
# Browse and Make PDS\_Lab as Root Folder



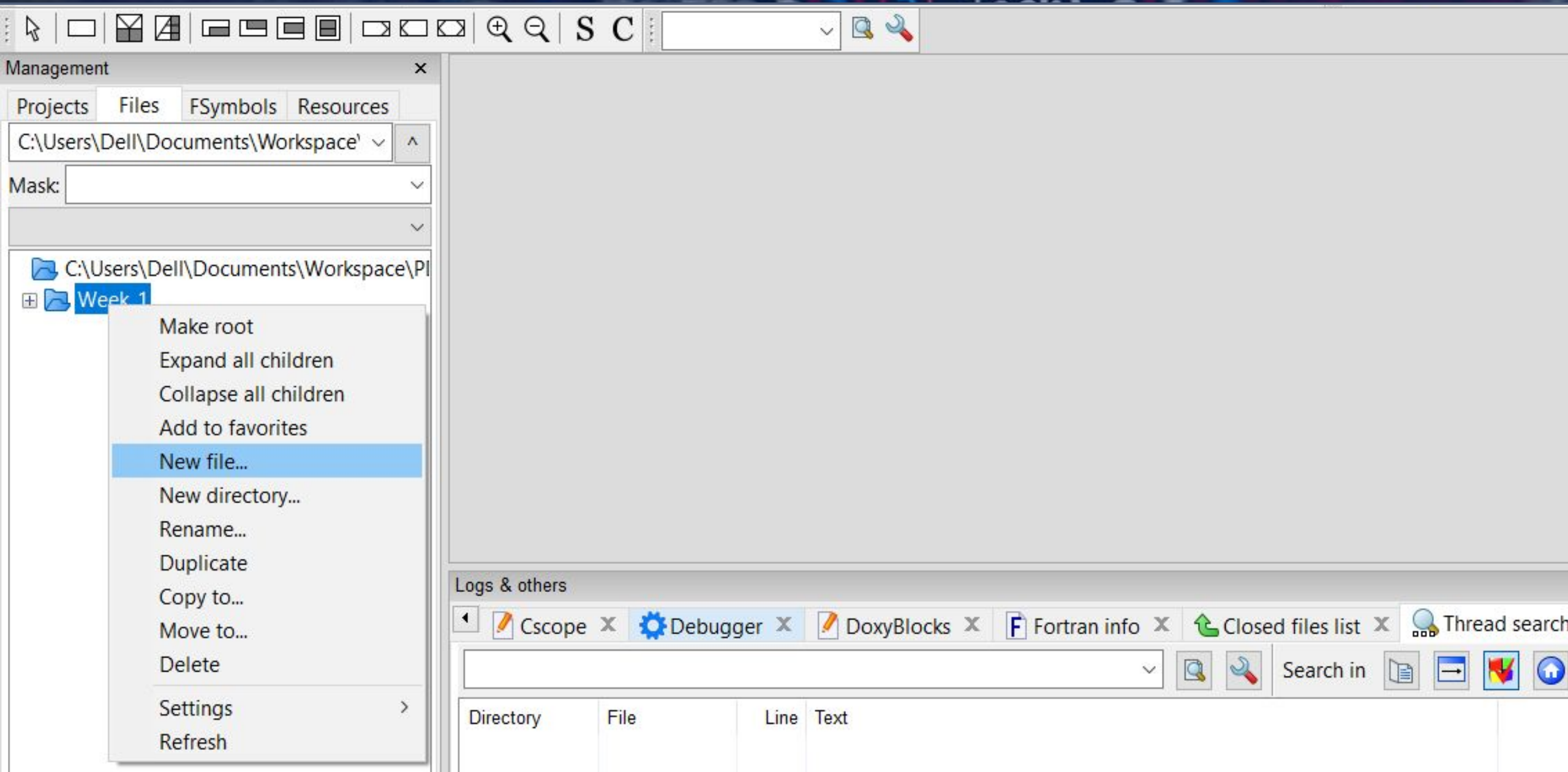
# Create a New Directory under PDS\_Lab



# Create a New Directory under PDS\_Lab

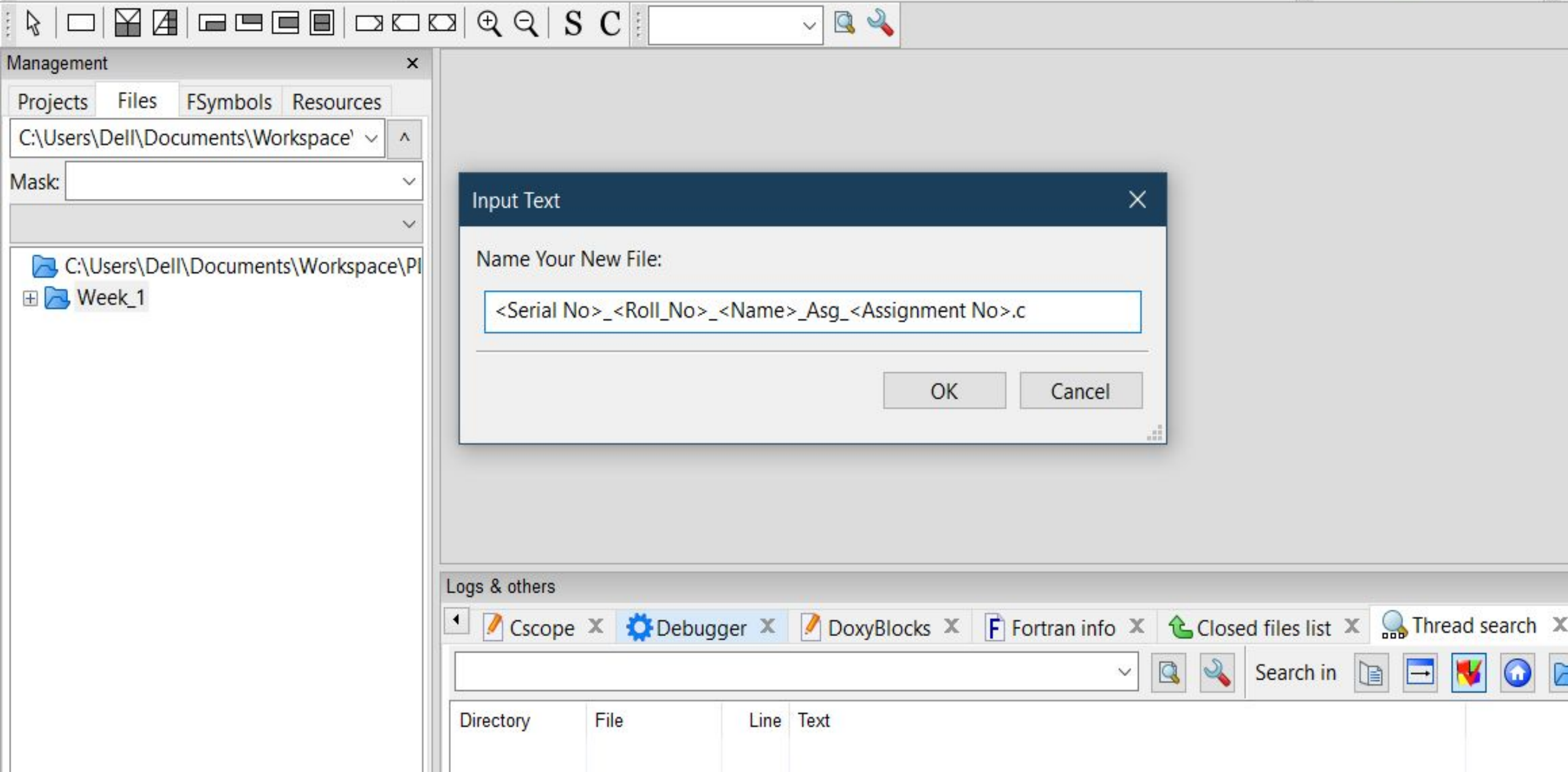


# Create a New File under Week\_1

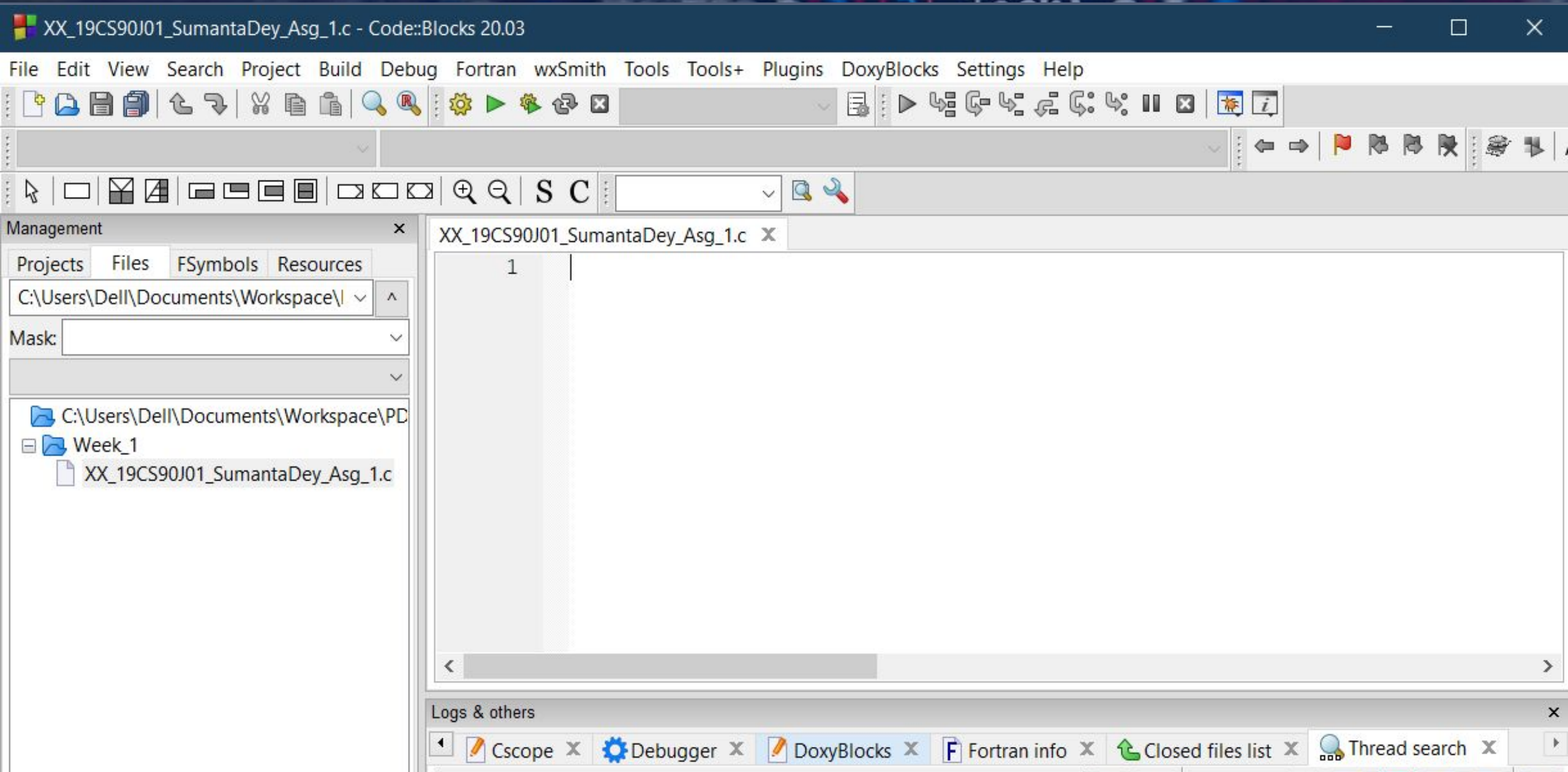




# Create a C Program File



# Open the C File



# First C Program

```
/******  
* Section : 1  
* Roll No. : 19CS19J01  
* Name : Sumanta Dey  
* Week : 1  
* Assignment No : 1  
* Description : First C program (Hello World!)  
*****/  
  
#include <stdio.h>  
int main()  
{  
    printf("Hello World!");  
    return 0;  
}
```

# IMPORTANT POINTS

- Every File Should be Named as:  
    <SL No>\_<Roll No>\_<Name>\_Asg\_<Assignment No>.c
- Every program must start with a comment containing:
  - Section No.
  - Roll No.
  - Name
  - Week
  - Assignment No.
  - A one line description of the assignment

**NB: If this is not followed, marks will be deducted**

# First C Program

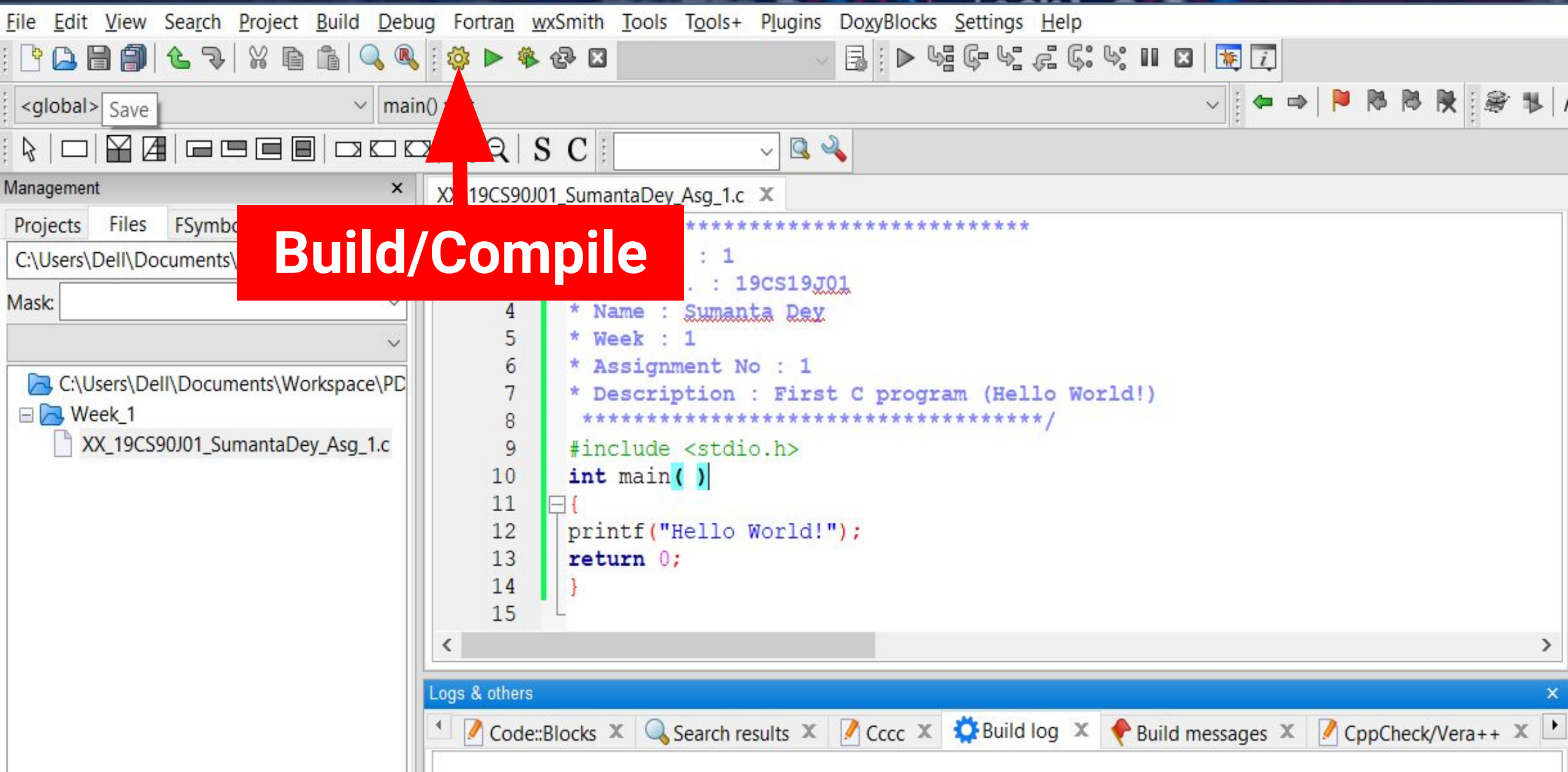
The screenshot shows a code editor interface with a menu bar (File, Edit, View, Search, Project, Build, Debug, Fortran, wxSmith, Tools, Tools+, Plugins, DoxyBlocks, Settings, Help) and a toolbar with various icons. The main editor window displays a C program file named 'XX\_19CS90J01\_SumantaDey\_Asg\_1.c'. The code is as follows:

```
1  /*****  
2  * Section : 1  
3  * Roll No. : 19CS19J01  
4  * Name : Sumanta Dey  
5  * Week : 1  
6  * Assignment No : 1  
7  * Description : First C program (Hello World!)  
8  *****/  
9  #include <stdio.h>  
10 int main( )  
11 {  
12     printf("Hello World!");  
13     return 0;  
14 }  
15
```

The left sidebar shows a 'Management' panel with tabs for 'Projects', 'Files', 'FSymbols', and 'Resources'. The 'Files' tab is active, showing the file structure: C:\Users\Dell\Documents\Workspace\PC > Week\_1 > XX\_19CS90J01\_SumantaDey\_Asg\_1.c. The bottom of the window features a 'Logs & others' panel with tabs for 'Cscope', 'Debugger', 'DoxyBlocks', 'Fortran info', 'Closed files list', and 'Thread'.



# Build It (Ctrl + F9) or Clicking Build Button

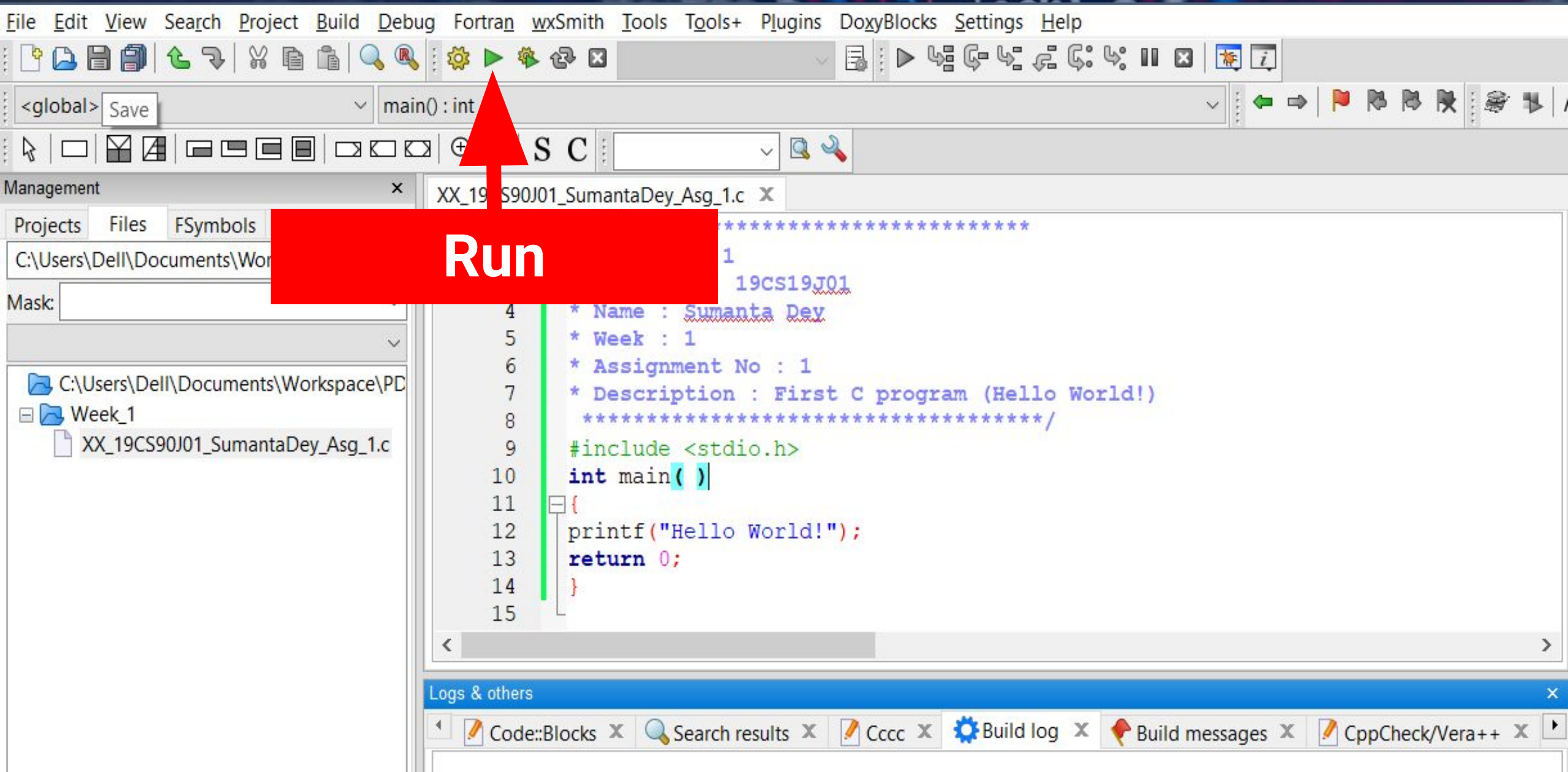


The screenshot shows the Code::Blocks IDE interface. The main window displays a C program with the following content:

```
*****  
: 1  
.: 19CS19J01  
4 * Name : Sumanta Dey  
5 * Week : 1  
6 * Assignment No : 1  
7 * Description : First C program (Hello World!)  
8 *****/  
9 #include <stdio.h>  
10 int main( )  
11 {  
12     printf("Hello World!");  
13     return 0;  
14 }  
15
```

A red arrow points to the Build button (gear icon) in the toolbar. A red box with the text "Build/Compile" is overlaid on the arrow. The bottom status bar shows several tabs: Code::Blocks, Search results, Cccc, Build log, Build messages, and CppCheck/Vera++.

# Run It (Ctrl + F10) or Clicking Run Button



The image shows a screenshot of a C++ IDE interface. The main window displays a C program with the following code:

```
1 *****  
2 1  
3 19CS19J01  
4 * Name : Sumanta Dey  
5 * Week : 1  
6 * Assignment No : 1  
7 * Description : First C program (Hello World!)  
8 *****/  
9 #include <stdio.h>  
10 int main( )  
11 {  
12     printf("Hello World!");  
13     return 0;  
14 }  
15
```

A red arrow points to the Run button (a green play icon) in the toolbar. A red box with the word "Run" is overlaid on the arrow.

The IDE interface includes a menu bar (File, Edit, View, Search, Project, Build, Debug, Fortran, wxSmith, Tools, Tools+, Plugins, DoxyBlocks, Settings, Help), a toolbar with various icons, and a sidebar with a file explorer showing the project structure:

- Projects
- Files
- FSymbols
- C:\Users\Dell\Documents\Work...
- Mask:
- C:\Users\Dell\Documents\Workspace\PC
- Week\_1
- XX\_19CS90J01\_SumantaDey\_Asg\_1.c

The bottom of the IDE shows a "Logs & others" panel with several tabs: Code::Blocks, Search results, Cccc, Build log, Build messages, and CppCheck/Vera++.





# Check the Output

C:\Users\Dell\Documents\Workspace\PDS\_LAB\Week\_1\XX\_19CS90J01\_SumantaDey\_Asg\_1.exe

Hello World!

Process returned 0 (0x0) execution time : 0.159 s

Press any key to continue.

# Check the Build Log for any Error/Warning

The screenshot displays the Code::Blocks IDE interface. The main editor window shows a C program with the following code:

```
1  /*****  
2  * Section : 1  
3  * Roll No. : 19CS19J01  
4  * Name : Sumanta Dey  
5  * Week : 1  
6  * Assignment No : 1  
7  * Descriptio  
8  *****/  
9  #include <st  
10 int main( )  
11 {  
12 printf("Hello World!");  
13 return 0;  
14 }  
15
```

A red arrow points from a red box labeled "Build Log" to the "Build log" tab in the "Logs & others" panel. The build log content is as follows:

```
Checking for existence: C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.exe  
  
----- Build file: "no target" in "no project" (compiler: unknown)-----  
  
gcc.exe -c C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.c -o C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.exe  
gcc.exe -o C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.exe C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.c  
Process terminated with status 0 (0 minute(s), 4 second(s))  
0 error(s), 0 warning(s) (0 minute(s), 4 second(s))  
  
Checking for existence: C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.exe  
Executing: '"C:\Program Files\CodeBlocks\cb_console_runner.exe" "C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.exe" ("C:\Users\Dell\Documents\Workspace\PDS_LAB\Week_1\XX_19CS90J01_SumantaDey_Asg_1.exe")'
```

# First C Program

```
/******  
* Section : 1  
* Roll No. : 19CS19J01  
* Name : Sumanta Dey  
* Week : 1  
* Assignment No : 1  
* Description : First C program (Hello World!)  
*****/  
  
#include <stdio.h>  
int main()  
{  
    printf("Hello World!");  
    return 0;  
}
```

# Practice Program 1

Take any two numbers and print their value. Also, print their Addition, Subtraction, Multiplication, and Division result along with the operation name.

# Practice Program 2

Write a C Program to Compute Quotient and Remainder.



# Happy Coding :)

“First, solve the problem. Then, write the code.” – John Johnson

