C Programming
Lab 1: IDE for C coding

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Outline

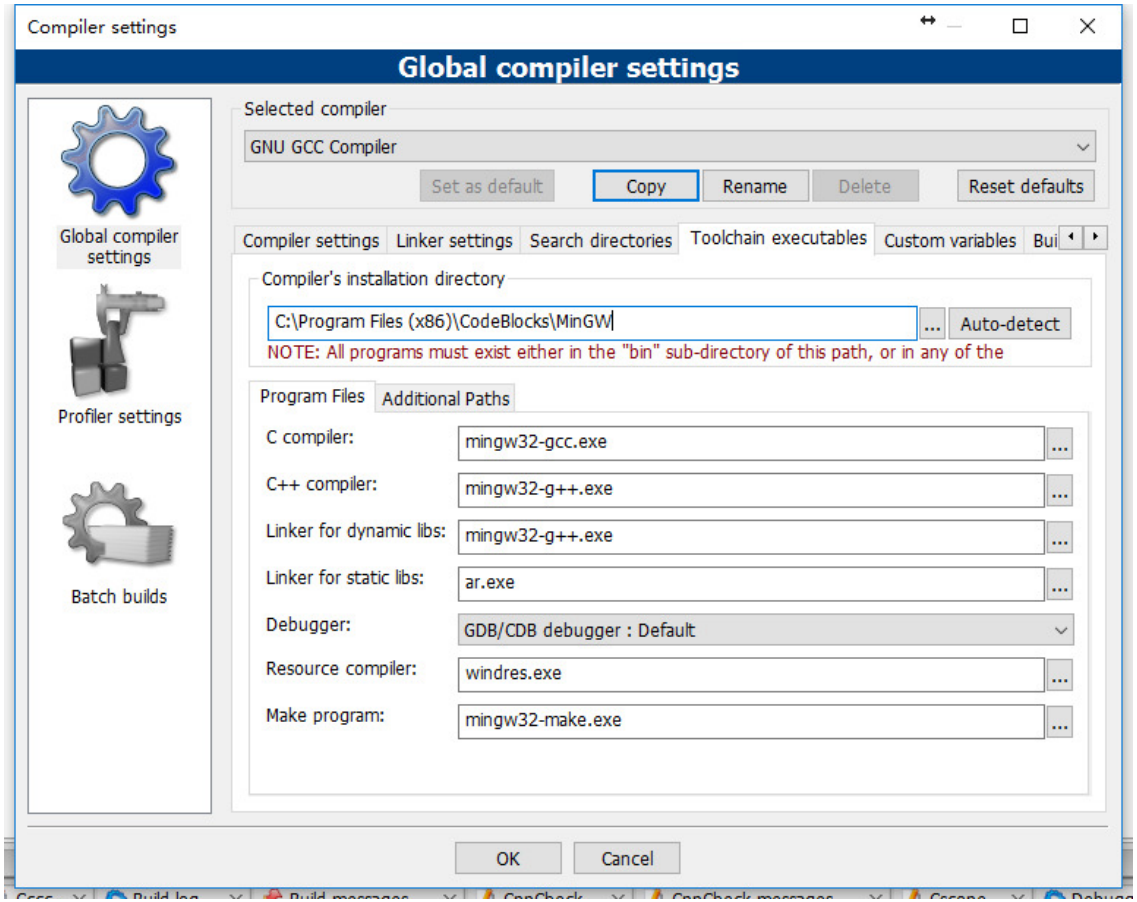
Codeblocks

- It is free software, available at following link

CodeBlocks 16.01 Windows binary

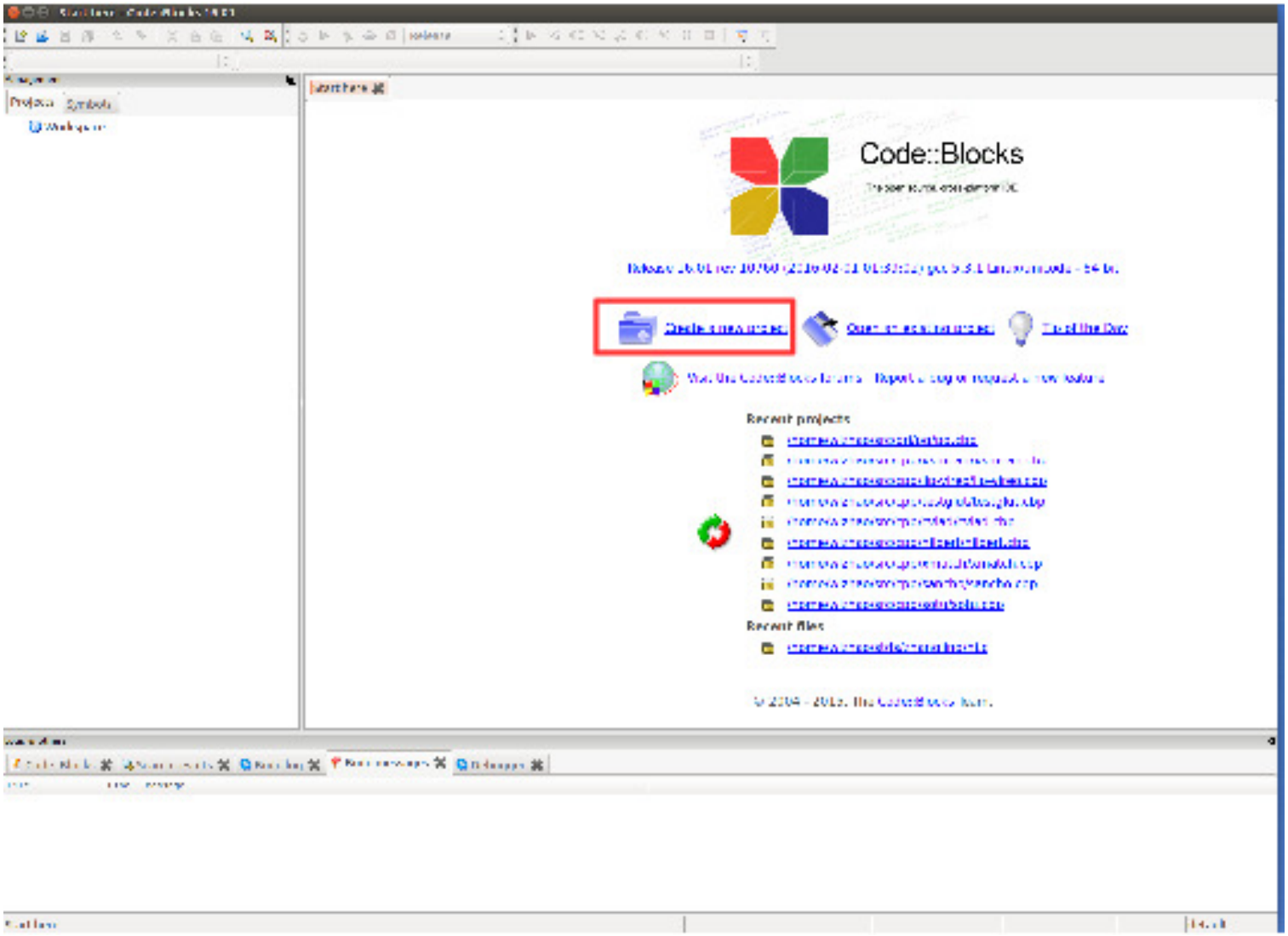
- Lightweiht and stable
- Cross platform: Linux, Windows and MacOS

Compiler Setup



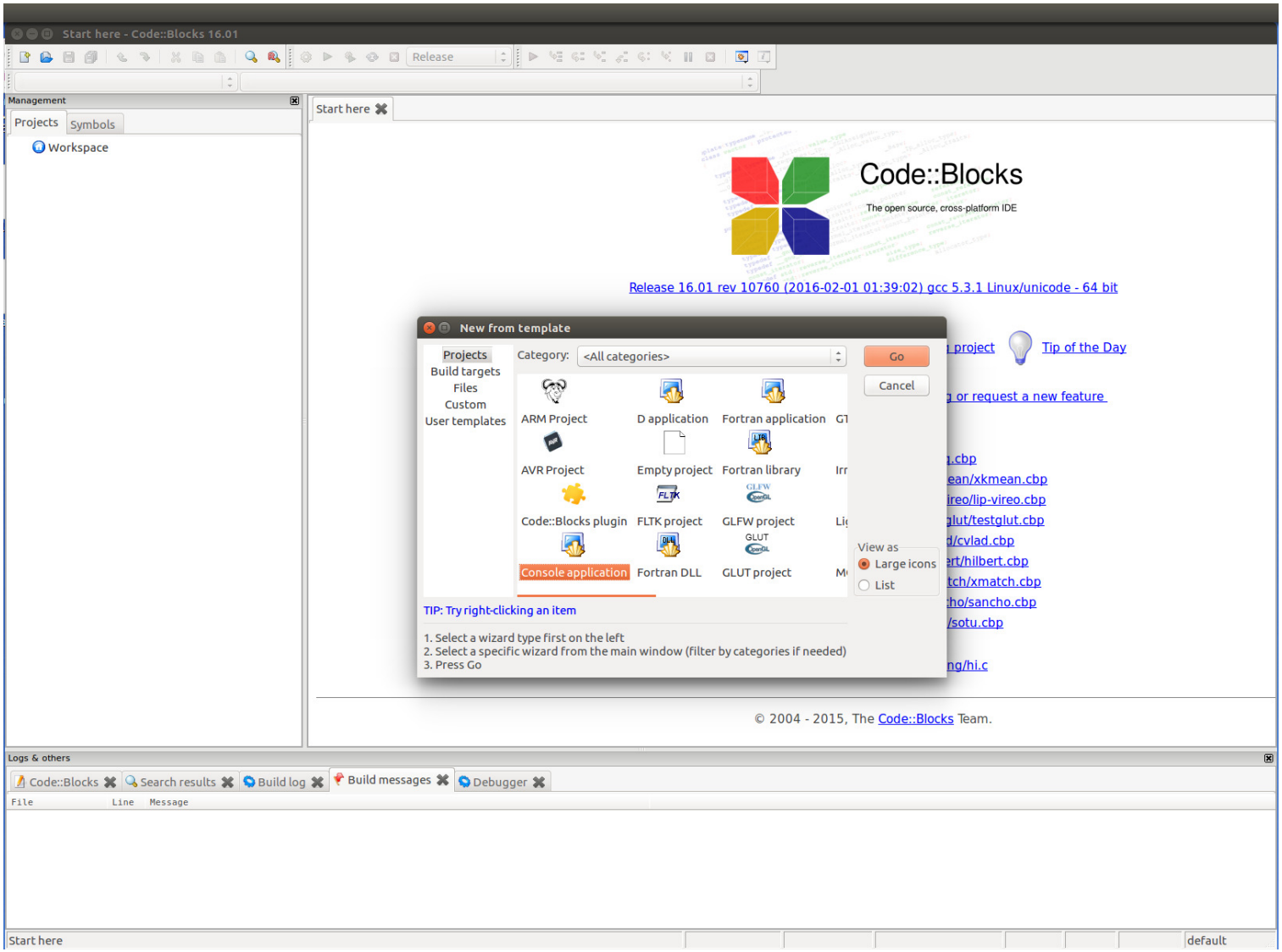
1. Go to menu: Settings→Compiler Settings→Toolchain Executables
2. Type in the path for mingw compiler, e.g., C:/Program Files (x86)/CodeBlocks/MingW/

Create a project: step 1



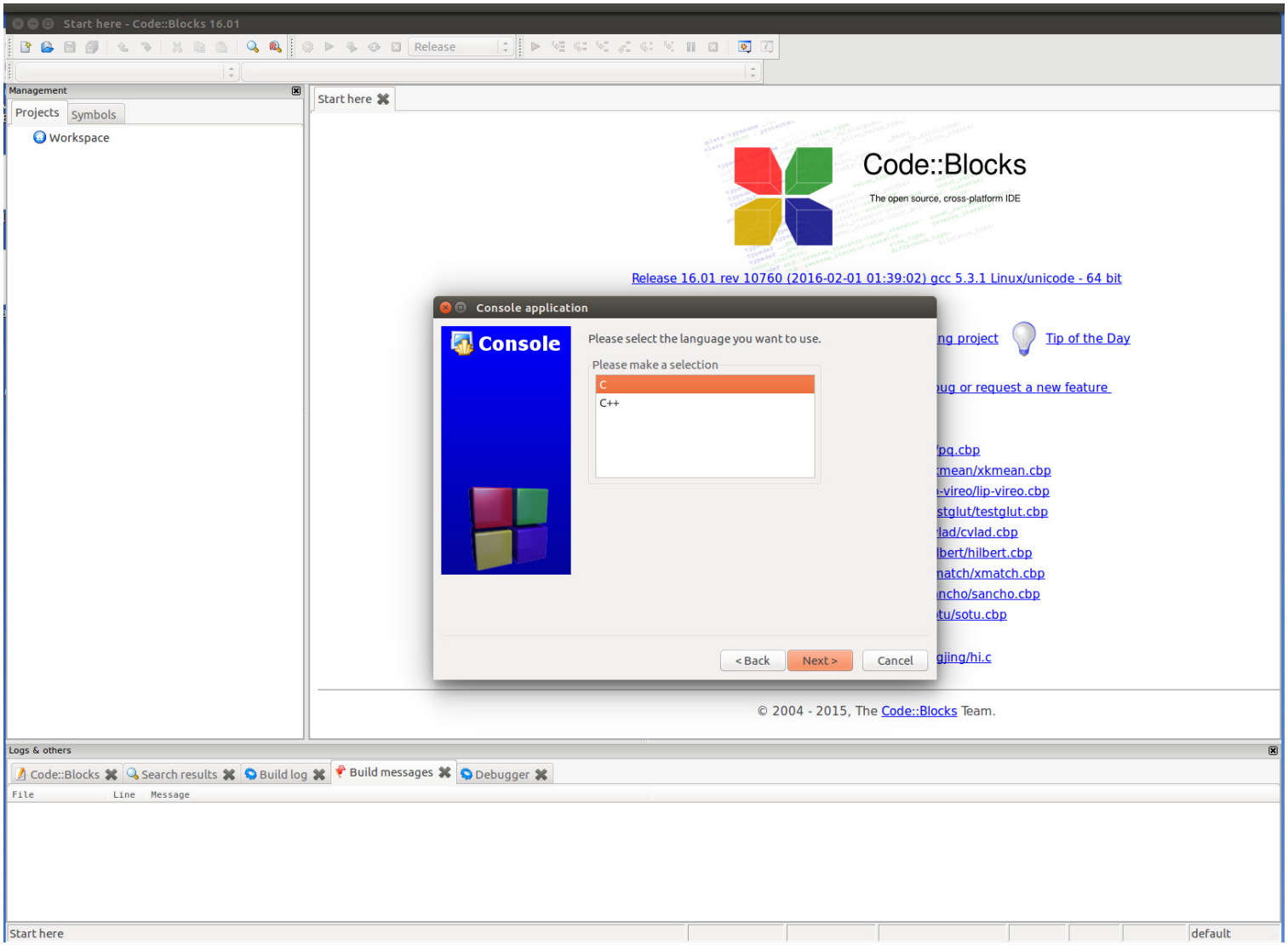
- Create/New a C project

Create a project: step 2



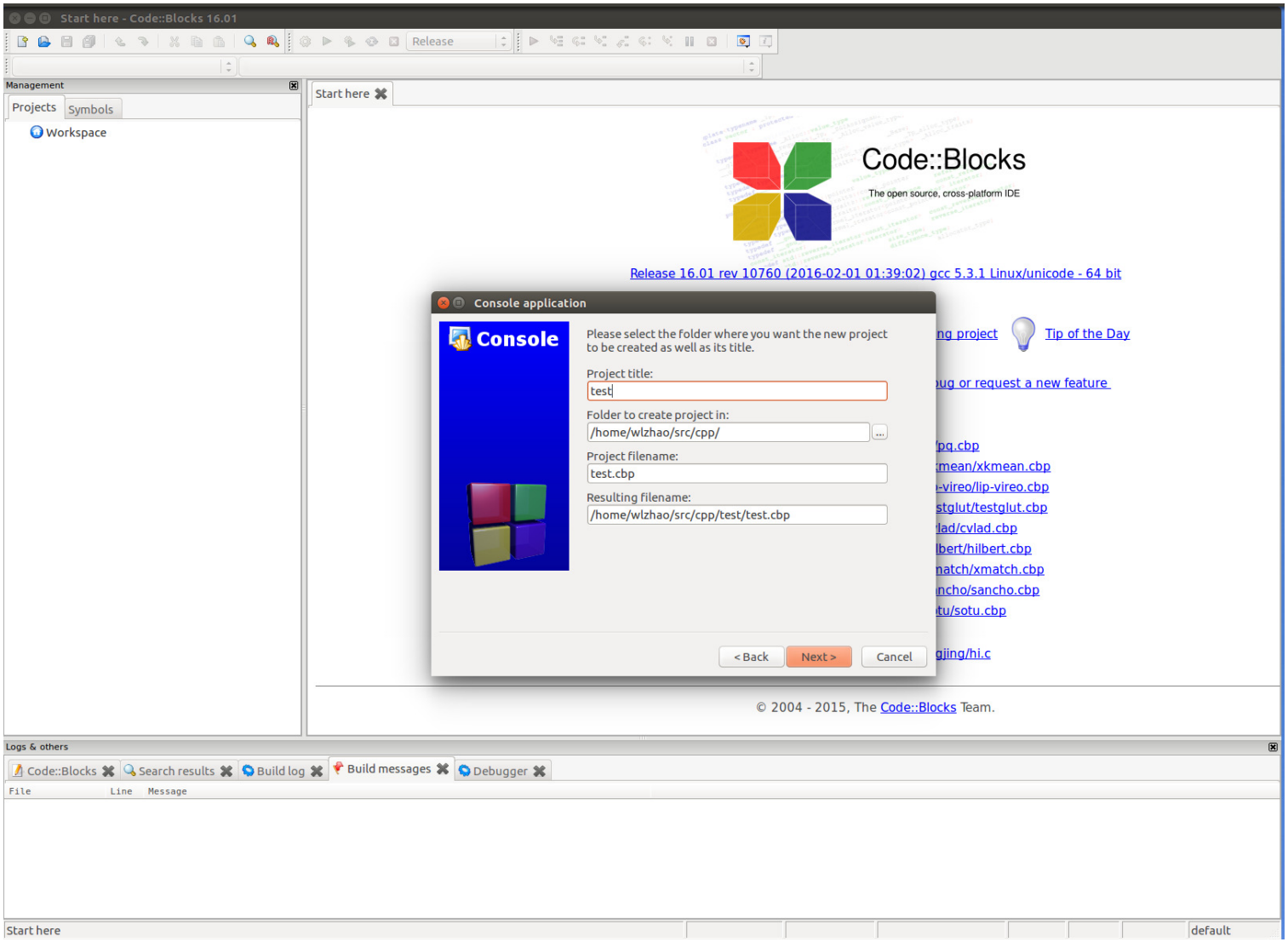
- Choose project type “Console application”

Create a project: step 3



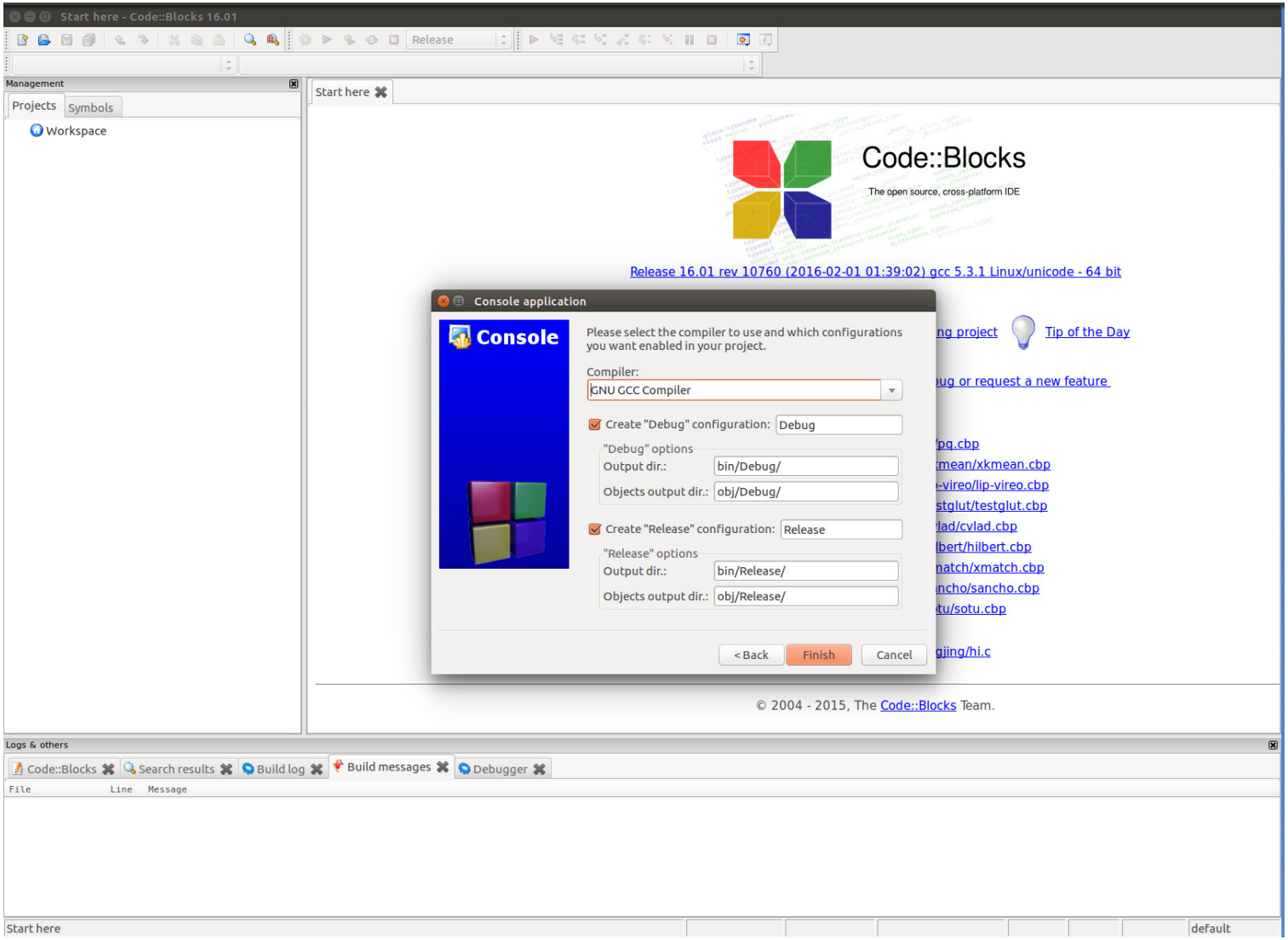
- Set it as a "C" project

Create a project: step 4



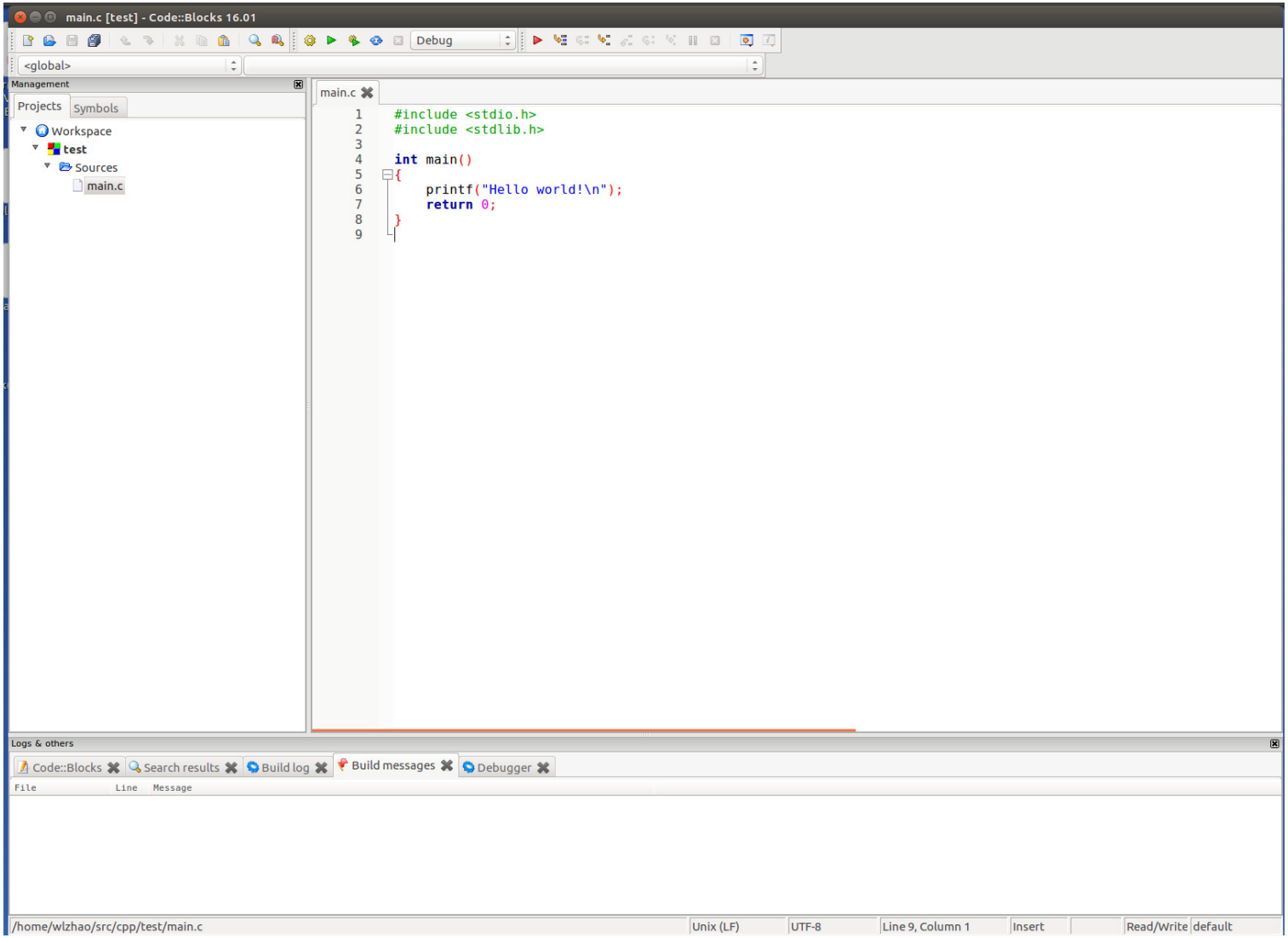
- Give a name for your project

Create a project: step 5



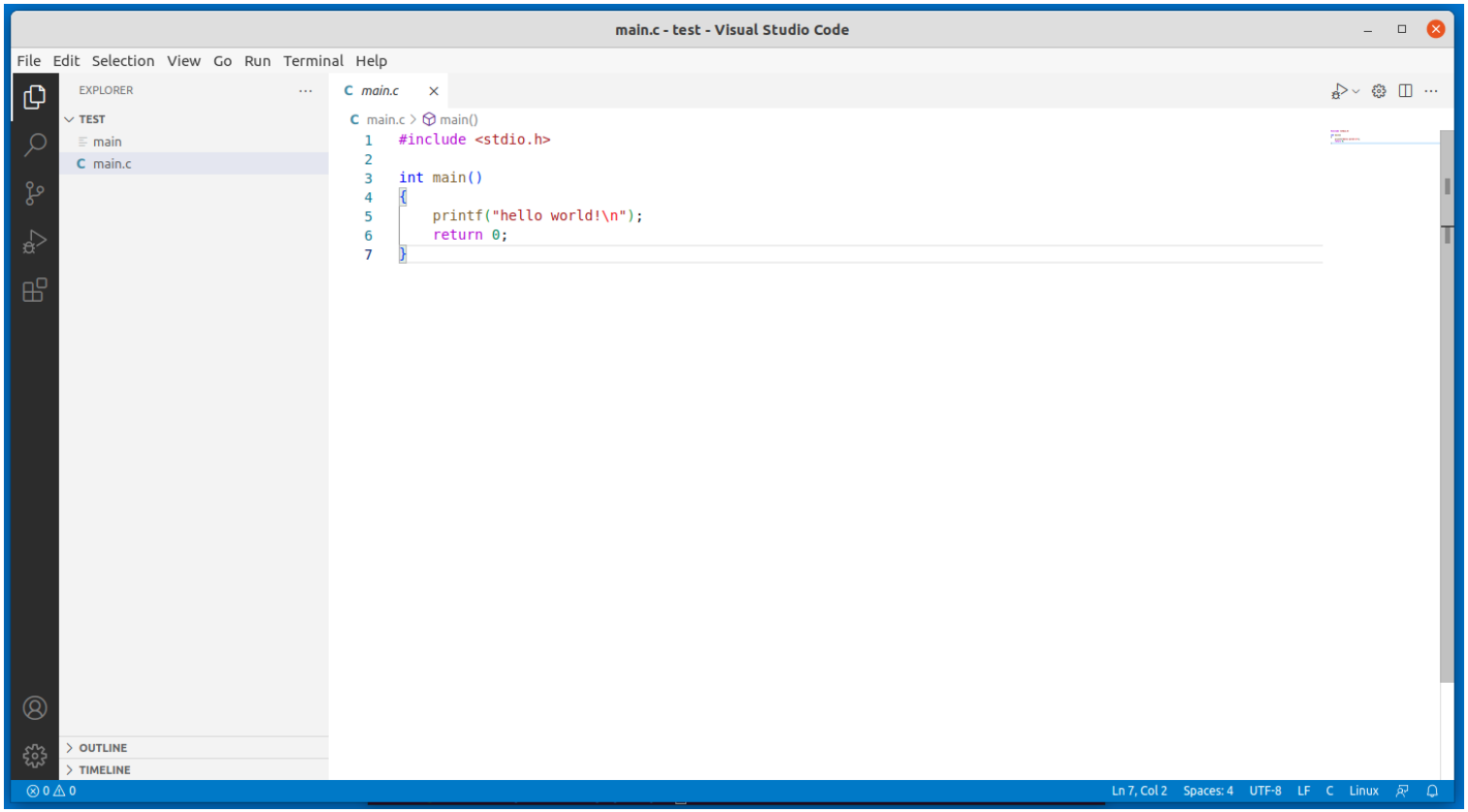
- Choose "C" compiler for your project

Create a project: step 6



- Start to work with your project

Main interface of VS code



- VS code is the most powerful and convenient Editor[1]
- One editor for designed for various programming languages, C, C++, Python and Java, etc

[1] https://code.visualstudio.com/download

Outline

Variable Types and Operations

- Try following code:

```c
#include <stdio.h>
int main( )
{
   int a = 5, b = 3;
   float val1 = a/b;
   float val2 = (float)(a/b);
   float val3 = (float)(a+0.0)/b;
   printf("a/b is: val1 = %f\n", val1);
   printf("a/b is: val2 = %f\n", val2);
   printf("a/b is: val3 = %f\n", val3);
}
```

Character and String

- Try following code:

```c
#include <stdio.h>
int main()
{
    char *str1 = "abc\0de";
    char *str2 = "abc\rde";
    char *str3 = "abc\tde";
    char *str4 = "abc\t\b\b\b\b\bde";
    char ch1 = 'A'+6;
    char ch2 = 'A' + 'B';
    printf("%s\n", str1);
    printf("%s\n", str2);
    printf("%s\n", str3);
    printf("%s\n", str4);
    printf("%c, value=%d\n", ch1, ch1);
    printf("%c, value=%d\n", ch2, ch2);
}
```

How Variable Behaves

- Guess the values of **a**, **i** and **j**
- Try following code to verify your answer:

```c
#include <stdio.h>
int main()
{
    int  i = 4, j = 6;
    int  a = i + j;
    printf("a = %d\n", a);
    i = j - i;
    j = i + j;
    printf("i = %d, j = %d\n", i, j);
}
```

printf() and Precision Control

- Given float number a = 231.36952, integer number b = 39 and integer number c=0xEE
  1. Print out a with 2 digits precision and 3 digits precision respectively
  2. Print out octal and hexadecimal values of b
  3. Print out decimal and octal nunmber of c

```
#include <stdio.h>
int main( )
{
    float a = 231.36952;
    int b = 39;
    int c = 0xEE;
}
```

Print out the values of different variables

- Given following variables have been defined
- Please show the number of bytes they occupy in the memory

```c
#include <stdio.h>
int main()
{
    char ch = 'B';
    int  a  = 0;
    short b = 1024;
    double c = 0.1;
    float d = 22;
    double e = 3.1415926;
}
```

- Please print the values of different variables on the screen
- For example,

```c
    printf("%f\n", d);
```

Precision of float and double

```c
#include <stdio.h>
int main()
{
    double c = 0.1;
    float d = 22;
    double e = 3.1415926;
    printf("e = %1.4lf\n", e);
    printf("e = %1.3lf\n", e);
    printf("e = %1.2lf\n", e);
}
```

Print integer numbers with formating

- Print out a=234, b=5, c=123, d=55, two numbers in each line
- Numbers are separated by ‘, ’
- Each number occupy 6 digital position, right-aligned

```
___234,_____5
___123,____55
```

Print integer numbers with right-aligned

- Try following code:

```c
#include <stdio.h>
int main()
{
    int a = 234;
    int b = 5;
    int c = 1231;
    int d = 55;
    printf("%6d, %6d\n", a, b);
    printf("%6d, %6d\n", c, d);
}
```

Print integer numbers with left-aligned

- Try following code:

```c
#include <stdio.h>
int main()
{
    int a = 234;
    int b = 5;
    int c = 1231;
    int d = 55;
    printf("%-6d, %-6d\n", a, b);
    printf("%-6d, %-6d\n", c, d);
}
```