

C++ Tutorial - Google Test (gtest)

目录

| | |
|--|---|
| Google Unit Test (GTest)..... | 1 |
| Step 1. Download Google test (gtest) | 3 |
| Step 2. Compile gtest into a static library..... | 4 |
| Step 3. Create a unit test project | 7 |
| Step 4. Create a Test Case | 9 |

Google Unit Test (GTest)

The Framework of Google C++ Testing is based on xUnit architecture. It is a cross platform system that provides automatic test discovery. In other words, we don't have to enumerate all of the test in our test suite manually. It supports a rich set of assertions such as fatal assertions (**ASSERT_**), non-fatal assertions (**EXPECT_**), and death test which checks that a program terminates expectedly.

Here is the [Primer](#).

GTest also provides various options for running tests and offers textual and XML report. It also supports a mock object testing framework (Google Mock).

Initially, we have a project calculating a cubic:

```
// simplemath.h

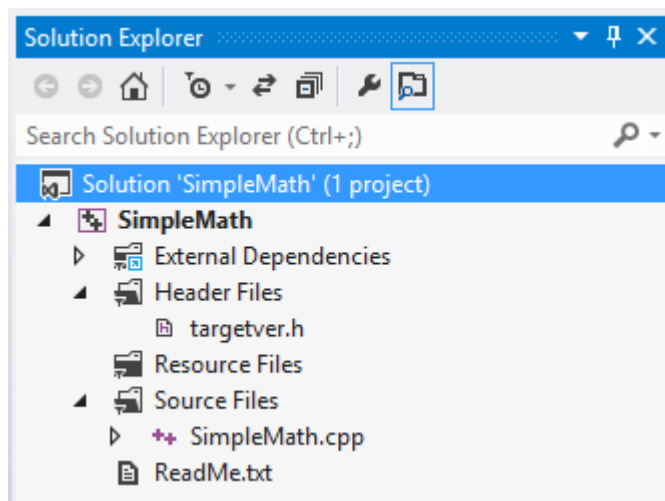
#include <cmath>

double cubic(double d)
{
    return pow(d,3) ;
}
```

```
}

// SimpleMath.cpp : Defines the entry point for the console
application.
#include "simplemath.h"

int main()
{
    cubic(10);
    return 0;
}
```



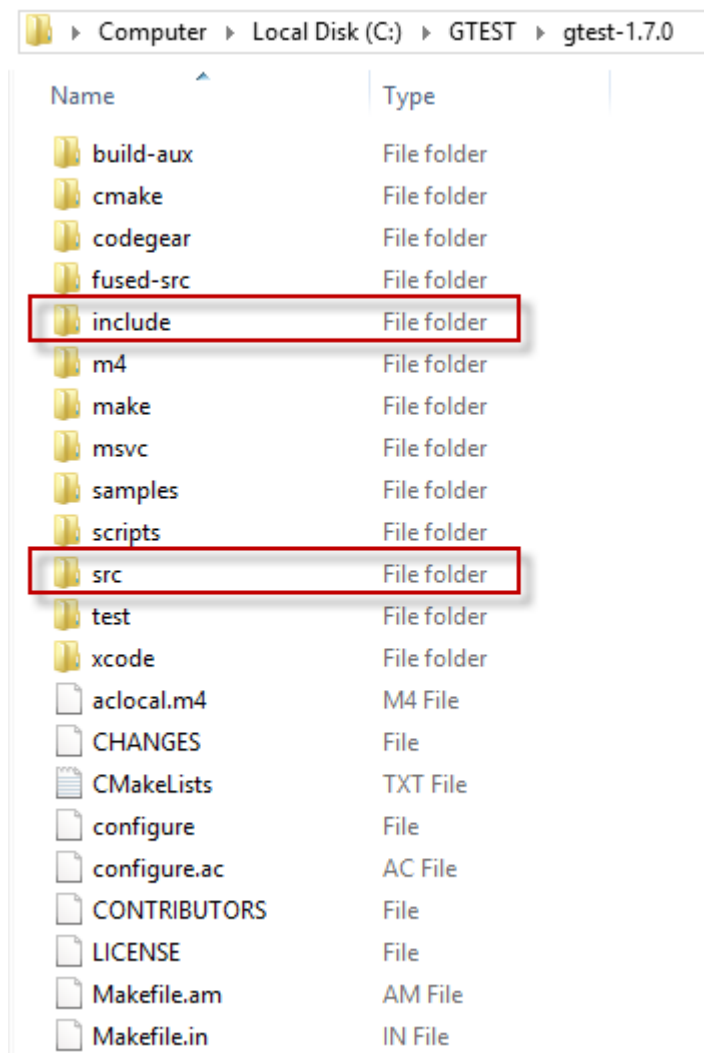
In the following example, we used Visual Studio 2012 with 4 steps:

1. Download Google test
2. Compile gtest into a static library
3. Create a unit test project
4. Make a test case

Step 1. Download Google test (gtest)

Download the **gtest-1.7.0-rc1.zip** from [Google C++ Unit Test](#) or from [gtest-1.7.0-rc1.zip](#), then extracts it.

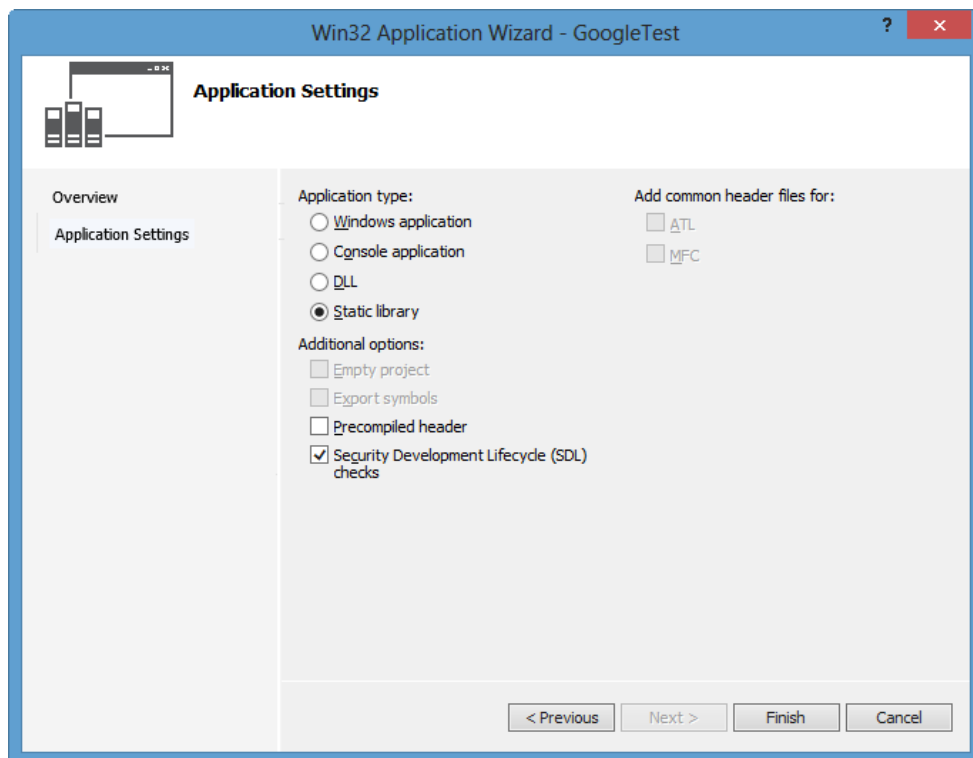
Let's look at the **C:\GTEST\gtest-1.7.0** directory to see what files are there.



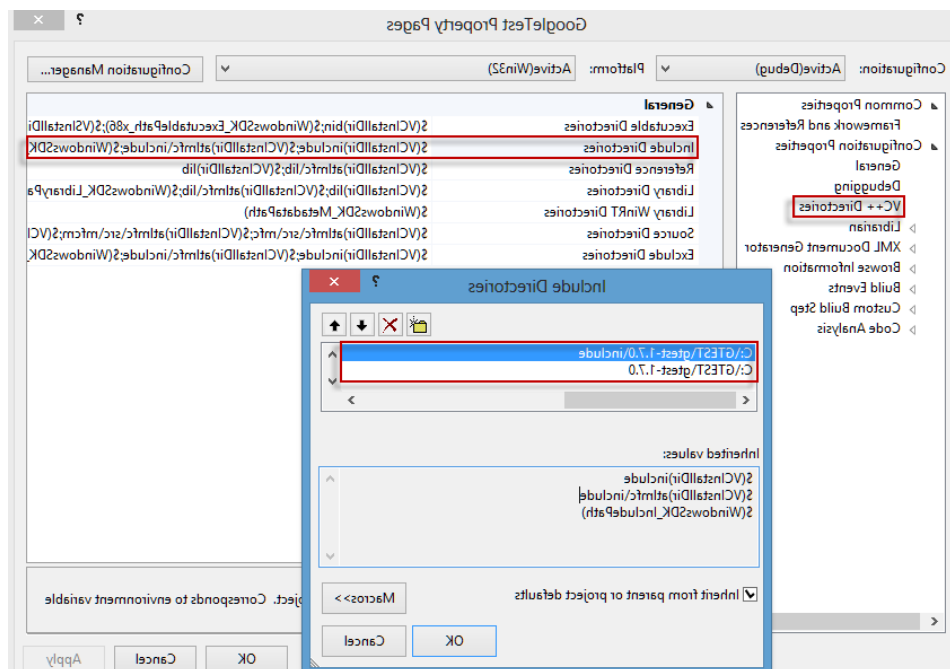
The **src** folder has all the gtest source files and later we need to add the **include** directory to the include path.

Step 2. Compile gtest into a static library

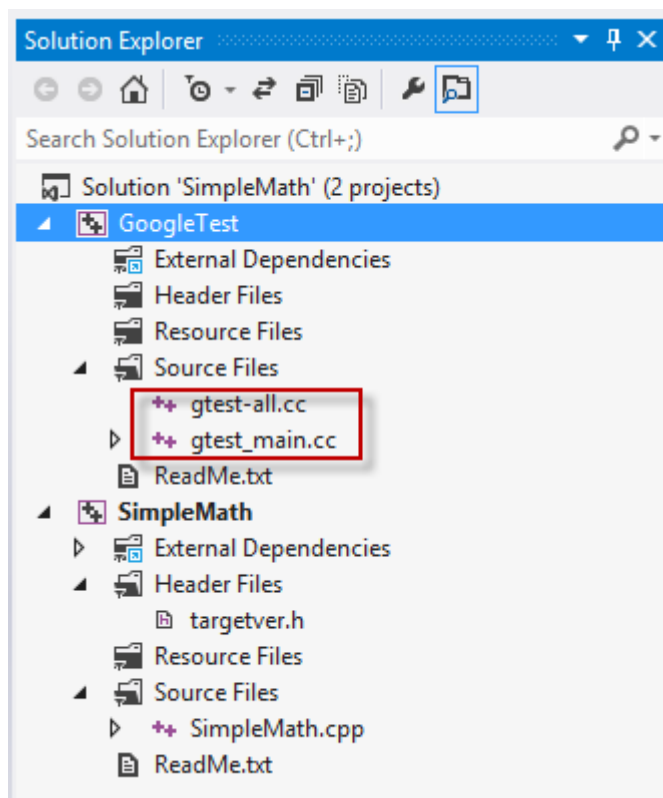
1. Create a new static library project with a name **GoogleTest**. Add->New Project->Win32 Project->Static Library without precompiled header.



2. Right click on our new project, **GoogleTest**. On the Properties Pages, add include path: **C:\GTEST\gtest-1.7.0** and **C:\GTEST\gtest-1.7.0\include**.



3. Add source files by Add->Existing Item...
C:\GTEST\gtest-1.7.0\src\gtest_all.cc
and **C:\GTEST\gtest-1.7.0\src\gtest_main.cc**.

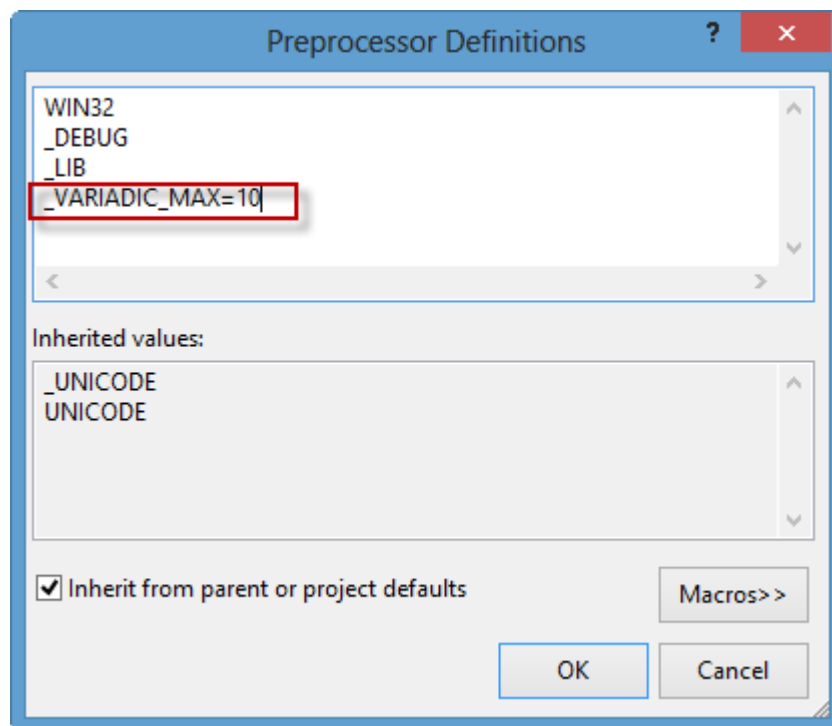


4. Build **GoogleTest** into static library.

In the build process, we may have some errors related to class template:

VC++ 2012 does not (and will never) support variadic templates; consequently, its standard library implementation attempts to fake them using preprocessor-generated overloads and specializations. The number of faux variadic template parameters defaults to 5 - the problem is that gtest is trying to instantiate `std::tuple<>` with as many as 10 template arguments. - [Google Test in Visual Studio 2012](#).

So, we need to set **_VARIADIC_MAX=10** for Preprocessor Definitions under C/C++.



Now, build it again:

```
1>----- Rebuild All started: Project: GoogleTest,
Configuration: Debug Win32 -----
1> gtest_main.cc
1> gtest-all.cc
1> Generating Code...
```

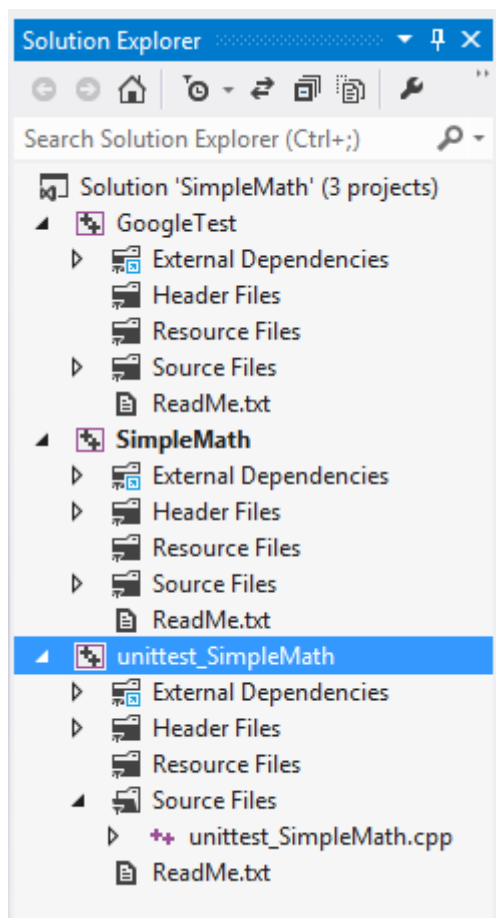
```
1> GoogleTest.vcxproj ->
c:\users\khyuck\documents\visual studio
2012\Projects\SimpleMath\Debug\GoogleTest.lib

===== Rebuild All: 1 succeeded, 0 failed, 0 skipped
=====
```

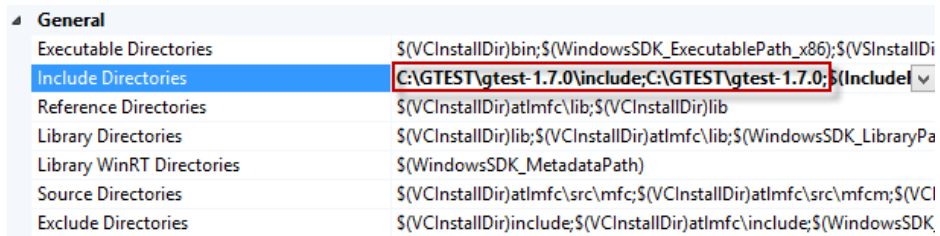
Step 3. Create a unit test project

Now, it's time to create a unit test project.

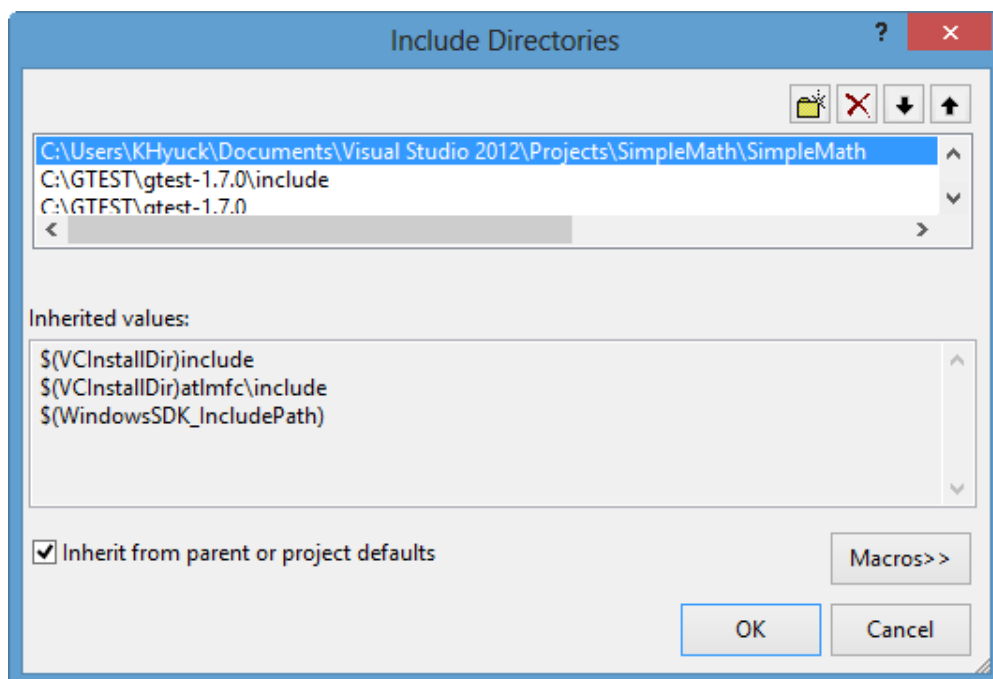
1. Right click on Solution->Add->New Project with a name **unittest_SimpleMath** as a Win32 Console. We've just added 3rd project to our solution:



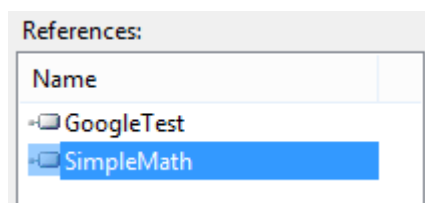
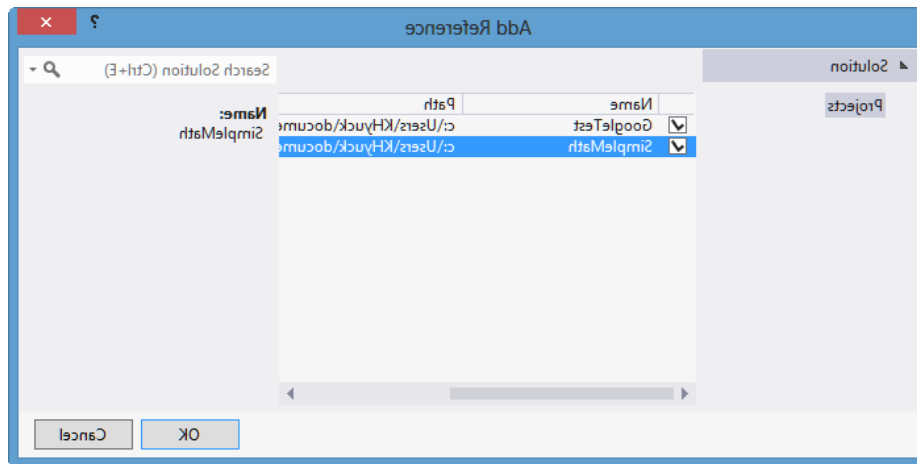
2. We need to add the two paths as we've done in Step 2:
Right click on our new project, **unittest_SimpleMath**.
On the Properties Pages, add include path:
C:\GTEST\gtest-1.7.0 and **C:\GTEST\gtest-1.7.0\include**.



3. This project needs additional path to the initial project (**SimpleMath**) which we want to be tested.



4. Let's add new references (**GoogleTest** and **SimpleMath**) to **unittest_SimpleMath**.
Right click on **unittest_SimpleMath**->References...
Under Property Pages->Add New References...



5. Great. Our Unit Test project has been set up. Final step will be making a test case.

Step 4. Create a Test Case

Now, we need to create a test case.
Type in the following lines of code:

```
// unittest_SimpleMath.cpp : Defines the entry point for the
console application.

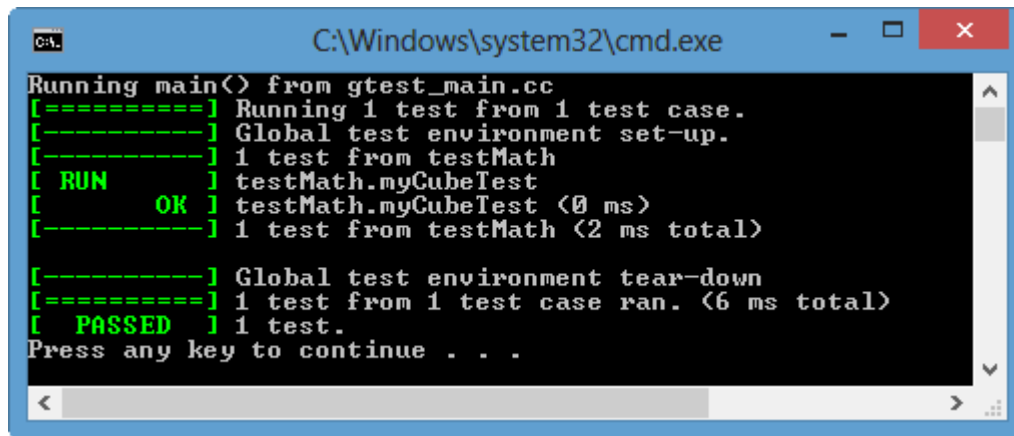
#include "gtest/gtest.h"
#include "simplemath.h"

TEST(testMath, myCubeTest)
{
    EXPECT_EQ(1000, cubic(10));
}
```

```
}
```

Here, we're testing the **cubic()** function we wrote before, and it compares the output of 10^3 with 1000 using macro **EXPECT_EQ**.

If we run the **unittest_SimpleMath**, we get the test result:



```
C:\Windows\system32\cmd.exe

Running main() from gtest_main.cc
[=====] Running 1 test from 1 test case.
[-----] Global test environment set-up.
[-----] 1 test from testMath
[ RUN      ] testMath.myCubeTest
[          OK ] testMath.myCubeTest (0 ms)
[-----] 1 test from testMath (2 ms total)

[-----] Global test environment tear-down
[=====] 1 test from 1 test case ran. (6 ms total)
[ PASSED   ] 1 test.
Press any key to continue . . .
```

OK!

We passed our first Google Test!