HowToTestCodeInVisualStudio

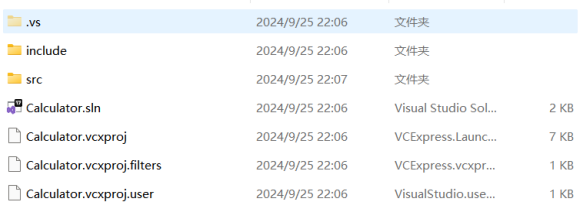
如何测试代码

举个使用gtest检测手动实现一个计算器原理的例子，这里我们只考虑将中缀表达式转换为后缀表达式的部分。

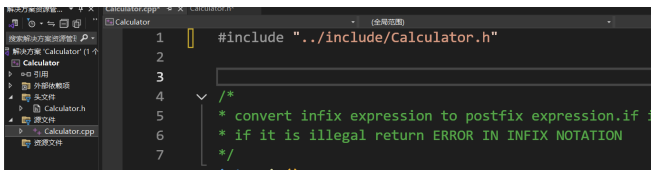
gtest环境配置

1.首先新建一个空项目

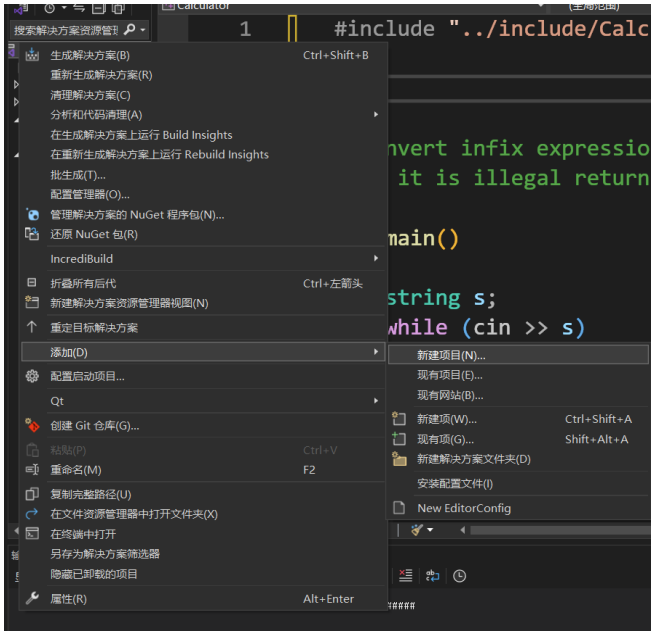
2.在项目中添加 `include` 和 `src` 文件分别用于存储头文件和源代码文件



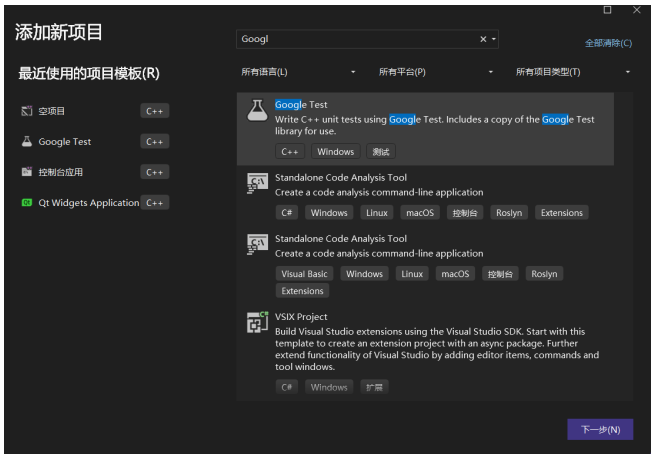
3.导入相应的头文件和源文件

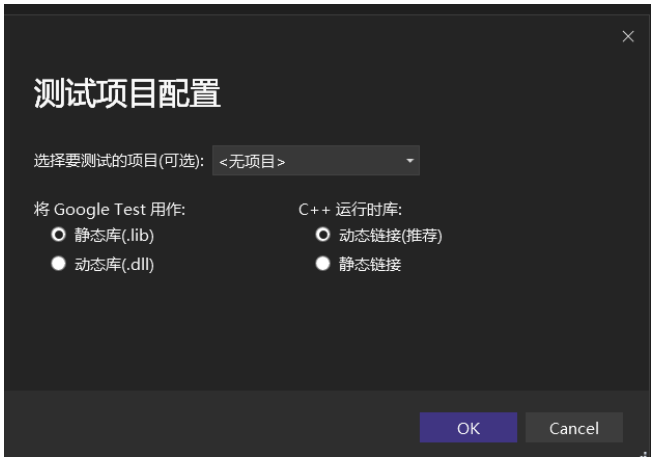


4.接着右击解决方案，创建新项目

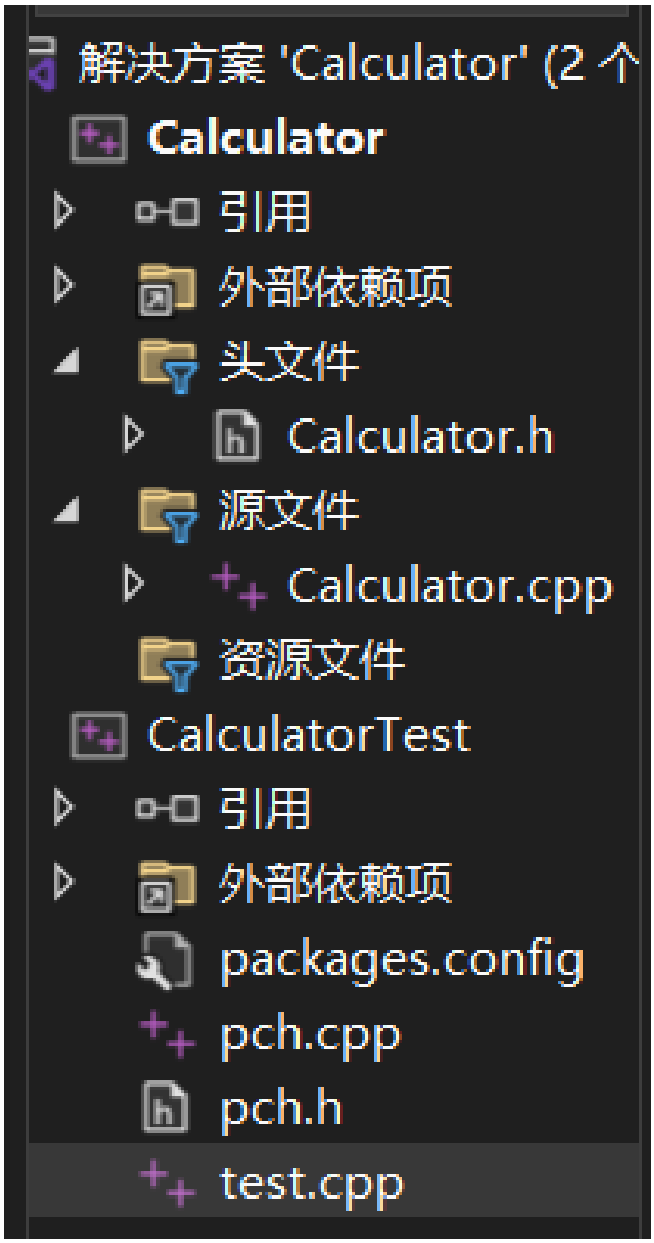


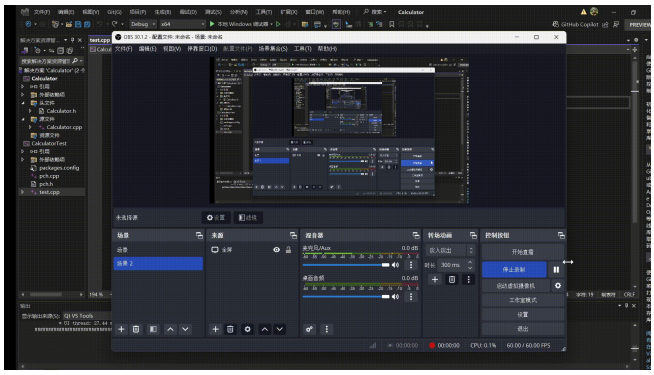
5.在项目界面选择GoogleTest 重新创建一个项目，配置保持默认即可





6.创建好之后项目结构如下，此时需要将test项目设置为启动项目，然后将Calculator项目的头文件添加到test项目的路径当中





7.接着就可以在test.cpp当中编写测试代码

这里我们测试能否将“1+2+3+4+5”转变为后缀表达式。

```cpp
#include "pch.h"
#include "../include/Calculator.h"
/*
*  Function test of infix2postfix
*/

// Operation test
TEST(ConvertionTest, addConvert)
{
    string infix = "1+2+3+4+5";
    string expected_postfix = "1 2 + 3 + 4 + 5 +";
    EXPECT_EQ(infix2postfix(infix), expected_postfix);

}TEST(ConvertionTest, minusConvert)
{
    string infix = "8-4+3-2-1";
    string expected_postfix = "8 4 - 3 + 2 - 1 -";
    EXPECT_EQ(infix2postfix(infix), expected_postfix);

}
```

在最下面我们可以看到自己通过的样例数目，这里我们一个样例都没有通过。

```
[----------] Global test environment tear-down
[==========] 12 tests from 2 test cases ran. (9 ms total)
[  PASSED  ] 0 tests.
[  FAILED  ] 12 tests, listed below:
[  FAILED  ] ConvertionTest.addConvert
[  FAILED  ] ConvertionTest.minusConvert
[  FAILED  ] ConvertionTest.timesConvert
[  FAILED  ] ConvertionTest.divisionConvert
[  FAILED  ] ConvertionTest.modelsConvert
[  FAILED  ] ConvertionTest.powConvert
[  FAILED  ] ConvertionTest.multipleOperations
[  FAILED  ] ConvertionTest.braceInmultipleOperation
[  FAILED  ] ConvertionTest.digitsOver10
[  FAILED  ] ConvertionTest.nagative
[  FAILED  ] ConvertionTest.decimals
[  FAILED  ] LeagcyTest.leagl
```

然后我们选取其中一个样例观察，观察到我们的输入和输出之间存在的差别

```
[ RUN      ] ConvertionTest.braceInmultipleOperation
D:\learn\dataStructureUnitTests\test.cpp(66): error: Expected equality of these values:
  infix2postfix(infix)
    Which is: "+a*b*d+ef*+cg"
  expected_postfix
    Which is: "a b c * + d e * f + g * +"
[  FAILED  ] ConvertionTest.braceInmultipleOperation (0 ms)
```

这样方便我们监测自己代码是否能够正常工作或者是达到预期。

参考资源

gtest编写教程

GTest / GMock 单元测试实践手册