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КАФЕДРА «Информационная безопасность» (ИУ8)

Лабораторная работа № 5
ПО КУРСУ
«Технологии и методы программирования»
на тему «Изучение фреймворков для тестирования на
примере GTest»

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1. Создайте CMakeList.txt для библиотеки banking.
2. Создайте модульные тесты на классы Transaction и Account.
 - 2.1 Используйте mock-объекты.
 - 2.2 Покрытие кода должно составлять 100%.
3. Настройте сборочную процедуру на TravisCI.
4. Настройте Coveralls.io.

```
$ gsed -i '/option(BUILD_EXAMPLES "Build examples" OFF)/a\  
  
option(BUILD_TESTS "Build tests" OFF)  
  
' CMakeLists.txt  
  
$ cat >> CMakeLists.txt <<EOF
```

```
if(BUILD_TESTS)  
  
    enable_testing()  
  
    add_subdirectory(third-party/gtest)  
  
    file(GLOB ${PROJECT_NAME}_TEST_SOURCES tests/*.cpp)  
  
    add_executable(check ${${PROJECT_NAME}_TEST_SOURCES})  
  
    target_link_libraries(check ${PROJECT_NAME} gtest_main)  
  
    add_test(NAME check COMMAND check)  
  
endif()
```

```
File Actions Edit View Help
├─ preview.png
├─ README.md
└─ ...

2 directories, 8 files

(kali@kali)~[~/lab05]
$ cd banking
cd: no such file or directory: banking

(kali@kali)~[~/lab05]
$ cd /banking
cd: no such file or directory: /banking

(kali@kali)~[~/lab05]
$ cd lab05

(kali@kali)~[~/lab05/lab05]
$ cd banking

(kali@kali)~[~/lab05/lab05/banking]
$ vim CMakeLists.txt

[No write since last change]
zsh:1: command not found: qw

shell returned 127

Press ENTER or type command to continue

(kali@kali)~[~/lab05/lab05/banking]
$ vim CMakeLists.txt

(kali@kali)~[~/lab05/lab05/banking]
$ vim Transaction.cpp

(kali@kali)~[~/lab05/lab05/banking]
$ cd ..

(kali@kali)~[~/lab05/lab05]
$ mkdir third-party

(kali@kali)~[~/lab05/lab05]
$ git submodule add https://github.com/google/googletest third-party/gtest
Cloning into '/home/kali/lab05/lab05/third-party/gtest' ...
remote: Enumerating objects: 24397, done.
remote: Counting objects: 100% (62/62), done.
remote: Compressing objects: 100% (27/27), done.
remote: Total 24397 (delta 29), reused 51 (delta 28), pack-reused 24335
Receiving objects: 100% (24397/24397), 10.27 MiB | 2.48 MiB/s, done.
Resolving deltas: 100% (18047/18047), done.

(kali@kali)~[~/lab05/lab05]
$
```

```
kali@kali: ~/lab05/lab05...
File Actions Edit View Help
(kali@kali)-[~/lab05/lab05]
$ cd testi
(kali@kali)-[~/lab05/lab05/testi]
$ vim CMakeLists.txt
(kali@kali)-[~/lab05/lab05/testi]
$ cd ..
(kali@kali)-[~/lab05/lab05]
$ cd banking
(kali@kali)-[~/lab05/lab05/banking]
$ vim CMakeLists.txt
(kali@kali)-[~/lab05/lab05/banking]
$ cd ..
(kali@kali)-[~/lab05/lab05]
$ cd testi
(kali@kali)-[~/lab05/lab05/testi]
$ cmake -H. -B_build -DBUILD_TESTS=ON
CMake Deprecation Warning at third-party/gtest/CMakeLists.txt:4 (cmake_minimum_required):
  Compatibility with CMake < 2.8.12 will be removed from a future version of
  CMake.

  Update the VERSION argument <min> value or use a ...<max> suffix to tell
  CMake that the project does not need compatibility with older versions.

CMake Deprecation Warning at third-party/gtest/googlemock/CMakeLists.txt:45 (cmake_minimum_required):
  Compatibility with CMake < 2.8.12 will be removed from a future version of
  CMake.

  Update the VERSION argument <min> value or use a ...<max> suffix to tell
  CMake that the project does not need compatibility with older versions.

CMake Deprecation Warning at third-party/gtest/gtest/CMakeLists.txt:56 (cmake_minimum_required):
  Compatibility with CMake < 2.8.12 will be removed from a future version of
  CMake.

  Update the VERSION argument <min> value or use a ...<max> suffix to tell
  CMake that the project does not need compatibility with older versions.

-- Configuring done
-- Generating done
-- Build files have been written to: /home/kali/lab05/lab05/testi/_build
(kali@kali)-[~/lab05/lab05/testi]
$
```

```
kali@kali: ~/lab05/lab05...  
  
File Actions Edit View Help  
#include "../banking/Account.h"  
#include "../banking/Transaction.h"  
#include "gtest/gtest.h"  
  
TEST(Transaction, Banking)  
{  
    const int sum1 = 500, sum2 = 300, fee = 100;  
  
    Account a1(123, sum1), a2(456, sum2);  
    Transaction test;  
  
    //set & get  
    EXPECT_EQ(test.fee(), 1);  
    test.set_fee(fee);  
    EXPECT_EQ(test.fee(), fee);  
  
    //check exceptions  
    EXPECT_THROW(test.Make(a1, a1, 100), std::logic_error);  
    EXPECT_THROW(test.Make(a1, a2, -10), std::invalid_argument);  
    EXPECT_THROW(test.Make(a1, a2, 10), std::logic_error);  
    EXPECT_EQ(test.Make(a1, a2, test.fee()*2-1), false);  
    a2.Lock();  
    EXPECT_THROW(test.Make(a1, a2, 200), std::runtime_error);  
    a2.Unlock();  
  
    //check cancelled transaction  
    EXPECT_EQ(test.Make(a1, a2, sum1-fee), false);  
    EXPECT_EQ(a2.GetBalance(), sum2);  
    EXPECT_EQ(a1.GetBalance(), sum1);  
  
    //check successful transaction  
    EXPECT_EQ(test.Make(a1, a2, 300), true);  
    EXPECT_EQ(a2.GetBalance(), sum2+300);  
    EXPECT_EQ(a1.GetBalance(), sum1-300-fee);  
}
```

"test2.cpp" 35L, 993B


```
kali@kali: ~/lab05/
File Actions Edit View Help
[ 42%] Building CXX object third-party/gtest/googletest/CMakeFiles/gtest_main.dir/src/gtest_main.cc.o
[ 50%] Linking CXX static library ../../lib/libgtest_main.a
[ 50%] Built target gtest_main
[ 57%] Building CXX object CMakeFiles/check.dir/test1.cpp.o
[ 64%] Building CXX object CMakeFiles/check.dir/test2.cpp.o
[ 71%] Linking CXX executable check
[ 71%] Built target check
[ 78%] Building CXX object third-party/gtest/googlemock/CMakeFiles/gmock.dir/src/gmock-all.cc.o
[ 85%] Linking CXX static library ../../lib/libgmock.a
[ 85%] Built target gmock
[ 92%] Building CXX object third-party/gtest/googlemock/CMakeFiles/gmock_main.dir/src/gmock_main.cc.o
[100%] Linking CXX static library ../../lib/libgmock_main.a
[100%] Built target gmock_main

(kali@kali)-[~/lab05/lab05/testi]
$ rm -rf _build

(kali@kali)-[~/lab05/lab05/testi]
$ rm -rf _build1

(kali@kali)-[~/lab05/lab05/testi]
$ rm -rf _build2

(kali@kali)-[~/lab05/lab05/testi]
$ rm -rf _build3

(kali@kali)-[~/lab05/lab05/testi]
$ _buildtest/check
Running main() from /home/kali/lab05/lab05/testi/third-party/gtest/googletest/src/gtest_main.cc
[=====] Running 2 tests from 2 test suites.
[=====] Global test environment set-up.
[-----] 1 test from Acc
[ RUN      ] Acc.testall
[      OK  ] Acc.testall (0 ms)
[-----] 1 test from Acc (0 ms total)

[-----] 1 test from Transaction
[ RUN      ] Transaction.Banking
123 send to 456 $400
Balance 123 is 500
Balance 456 is 300
123 send to 456 $300
Balance 123 is 100
Balance 456 is 600
[      OK  ] Transaction.Banking (0 ms)
[-----] 1 test from Transaction (0 ms total)

[-----] Global test environment tear-down
[=====] 2 tests from 2 test suites ran. (0 ms total)
[ PASSED  ] 2 tests.

(kali@kali)-[~/lab05/lab05/testi]
```

File Actions Edit View Help

shell returned 127

Press ENTER or type command to continue

```
(kali@kali)-[~/lab05/lab05/banking]
$ vim CMakeLists.txt
```

```
(kali@kali)-[~/lab05/lab05/banking]
$ vim Transaction.cpp
```

```
(kali@kali)-[~/lab05/lab05/banking]
$ cd ..
```

```
(kali@kali)-[~/lab05/lab05]
$ mkdir third-party
```

```
(kali@kali)-[~/lab05/lab05]
$ git submodule add https://github.com/google/googletest third-party/gtest
Cloning into '/home/kali/lab05/lab05/third-party/gtest' ...
remote: Enumerating objects: 24397, done.
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remote: Total 24397 (delta 29), reused 51 (delta 28), pack-reused 24335
Receiving objects: 100% (24397/24397), 10.27 MiB | 2.48 MiB/s, done.
Resolving deltas: 100% (18047/18047), done.
```

```
(kali@kali)-[~/lab05/lab05]
$ cd third-party/gtest && git checkout release-1.10.0 && cd ../..
Note: switching to 'release-1.10.0'.
```

You are in 'detached HEAD' state. You can look around, make experimental changes and commit them, and you can discard any commits you make in this state without impacting any branches by switching back to a branch.

If you want to create a new branch to retain commits you create, you may do so (now or later) by using `-c` with the switch command. Example:

```
git switch -c <new-branch-name>
```

Or undo this operation with:

```
git switch -
```

Turn off this advice by setting config variable `advice.detachedHead` to false

HEAD is now at 703bd9ca Googletest export

```
(kali@kali)-[~/lab05/lab05]
$ git add third-party/gtest
```

```
(kali@kali)-[~/lab05/lab05]
```