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Лабораторная работа № 2

ПО КУРСУ

«Технологии и методы программирования»

на тему «Изучение систем контроля версий на примере Git»

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Ход выполнения работы

Задание 1

Вам поручили перейти на систему автоматизированной сборки CMake. Исходные файлы находятся в директории formatter_lib. В этой директории находятся файлы для статической библиотеки formatter. Создайте CMakeList.txt в директории formatter_lib, с помощью которого можно будет собирать статическую библиотеку formatter.

```
tim@tim-VirtualBox:~/labs/lab3$ git init
Initialized empty Git repository in /home/tim/labs/lab3/.git/
tim@tim-VirtualBox:~/labs/lab3$ git clone https://github.com/tp-labs/lab03
Cloning into 'lab03'...
remote: Enumerating objects: 91, done.
remote: Counting objects: 100% (3/3), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 91 (delta 0), reused 2 (delta 0), pack-reused 88
Unpacking objects: 100% (91/91), 1.03 MiB | 3.01 MiB/s, done.
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ touch CMakeList.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ vim CMakeList.txt
```

```
1 cmake_minimum_required(VERSION 3.4)
2 set(CMAKE_CXX_STANDARD 11)
3 set(CMAKE_CXX_STANDARD_REQUIRED ON)
4 project(task1)
5
6 add_library(formatter STATIC ${CMAKE_CURRENT_SOURCE_DIR}/formatter.cpp)
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ cmake -H. -B_build
-- The C compiler identification is GNU 9.4.0
-- The CXX compiler identification is GNU 9.4.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Configuring done
-- Generating done
-- Build files have been written to: /home/tim/labs/lab3/lab03/formatter_lib/_bu
ild
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ git add CMakeLists.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ git commit -m "added CMakeLi
st"
[master 50b6b67] added CMakeList
 1 file changed, 7 insertions(+)
 create mode 100644 formatter_lib/CMakeLists.txt
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ git remote add origin https://github.com/Teemo37/lab03.git
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_lib$ git push origin master
Username for 'https://github.com': Teemo37
Password for 'https://Teemo37@github.com':
Enumerating objects: 95, done.
Counting objects: 100% (95/95), done.
Delta compression using up to 4 threads
Compressing objects: 100% (92/92), done.
Writing objects: 100% (95/95), 1.02 MiB | 20.90 MiB/s, done.
Total 95 (delta 44), reused 0 (delta 0)
remote: Resolving deltas: 100% (44/44), done.
To https://github.com/Teemo37/lab03.git
 * [new branch]      master -> master
```

Задание 2

У компании "Formatter Inc." есть перспективная библиотека, которая является расширением предыдущей библиотеки. Т.к. вы уже овладели навыком созданием CMakeList.txt для статической библиотеки formatter, ваш руководитель поручает заняться созданием CMakeList.txt для библиотеки formatter_ex, которая в свою очередь использует библиотеку formatter.

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ touch CMakeLists.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ vim CMakeLists.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ cmake CMakeLists.txt
-- The C compiler identification is GNU 9.4.0
-- The CXX compiler identification is GNU 9.4.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Configuring done
-- Generating done
-- Build files have been written to: /home/tim/labs/lab3/lab03/formatter_ex_lib
```

```
cmake_minimum_required(VERSION 3.4)
set(CMAKE_CXX_STANDARD 11)
set(CMAKE_CXX_STANDARD_REQUIRED ON)
project(task2)

include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib)

add_library(formatter_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib/formatter.cpp)
add_library(formatter_ex_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/formatter_ex.cpp)

target_link_libraries(formatter_ex_lib formatter_lib)
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ cmake -H. -B_build
-- The C compiler identification is GNU 9.4.0
-- The CXX compiler identification is GNU 9.4.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Configuring done
-- Generating done
-- Build files have been written to: /home/tim/labs/lab3/lab03/formatter_ex_lib/_build
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ git add CMakeLists.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ git commit -m "added CMakeList"
[master 76ec337] added CMakeList
 1 file changed, 11 insertions(+)
 create mode 100644 formatter_ex_lib/CMakeLists.txt
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/formatter_ex_lib$ git push origin master
Username for 'https://github.com': Teemo37
Password for 'https://Teemo37@github.com':
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 588 bytes | 588.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/Teemo37/lab03.git
   50b6b67..76ec337  master -> master
```

Задание 3

Конечно же ваша компания предоставляет примеры использования своих библиотек. Чтобы продемонстрировать как работать с библиотекой formatter_ex, вам необходимо создать два CMakeList.txt для двух простых приложений: hello_world, которое использует библиотеку formatter_ex; solver, приложение которое испольует статические библиотеки formatter_ex и solver_lib.

```
cmake_minimum_required(VERSION 3.4)
set(CMAKE_CXX_STANDARD 11)
set(CMAKE_CXX_STANDARD_REQUIRED ON)
project(task2)

include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib)
include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_ex_lib)

add_library(formatter_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib/formatter.cpp)
add_library(formatter_ex_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_ex_lib/formatter_ex.cpp

add_executable(hw hello_world.cpp)

target_link_libraries(hw formatter_ex_lib formatter_lib)
```

```
cmake_minimum_required(VERSION 3.4)
set(CMAKE_CXX_STANDARD 11)
set(CMAKE_CXX_STANDARD_REQUIRED ON)
project(task2)

include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib)
include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_ex_lib)

add_library(formatter_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib/formatter.cpp)
add_library(formatter_ex_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_ex_lib/formatter_ex.cpp

add_executable(hw hello_world.cpp)

target_link_libraries(hw formatter_ex_lib formatter_lib)
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/hello_world_application$ make
Scanning dependencies of target formatter_ex_lib
[ 16%] Building CXX object CMakeFiles/formatter_ex_lib.dir/home/tim/labs/lab3/lab03/formatter_ex_lib/formatter_ex.cpp.o
[ 33%] Linking CXX static library libformatter_ex_lib.a
[ 33%] Built target formatter_ex_lib
Scanning dependencies of target formatter_lib
[ 50%] Building CXX object CMakeFiles/formatter_lib.dir/home/tim/labs/lab3/lab03/formatter_lib/formatter.cpp.o
.[ 66%] Linking CXX static library libformatter_lib.a
[ 66%] Built target formatter_lib
Scanning dependencies of target hw
[ 83%] Building CXX object CMakeFiles/hw.dir/hello_world.cpp.o
[100%] Linking CXX executable hw
[100%] Built target hw
tim@tim-VirtualBox:~/labs/lab3/lab03/hello_world_application$ ./hw
------------------------
hello, world!
------------------------
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/hello_world_application$ git push origin master
Username for 'https://github.com': Teemo37
Password for 'https://Teemo37@github.com':
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 597 bytes | 597.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/Teemo37/lab03.git
   76ec337..347f7da  master -> master
```

```
cmake_minimum_required(VERSION 3.4)
set(CMAKE_CXX_STANDARD 11)
set(CMAKE_CXX_STANDARD_REQUIRED ON)
project(task3)

include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib)
include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../formatter_ex_lib)
include_directories(${CMAKE_CURRENT_SOURCE_DIR}/../solver_lib)

add_library(formatter_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_lib/formatter.cpp)
add_library(formatter_ex_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../formatter_ex_lib/formatter_ex.cpp)
add_library(solver_lib STATIC ${CMAKE_CURRENT_SOURCE_DIR}/../solver_lib/solver.cpp)

add_executable(solver equation.cpp)

target_link_libraries(solver formatter_ex_lib formatter_lib solver_lib)
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/solver_application$ make
Scanning dependencies of target solver_lib
[ 12%] Building CXX object CMakeFiles/solver_lib.dir/home/tim/labs/lab3/lab03/solver_lib/solver.cpp.o
[ 25%] Linking CXX static library libsolver_lib.a
[ 25%] Built target solver_lib
Scanning dependencies of target formatter_lib
[ 37%] Building CXX object CMakeFiles/formatter_lib.dir/home/tim/labs/lab3/lab03/formatter_lib/formatter.cpp.o
[ 50%] Linking CXX static library libformatter_lib.a
[ 50%] Built target formatter_lib
Scanning dependencies of target formatter_ex_lib
[ 62%] Building CXX object CMakeFiles/formatter_ex_lib.dir/home/tim/labs/lab3/lab03/formatter_ex_lib/formatter_ex.cpp.o
[ 75%] Linking CXX static library libformatter_ex_lib.a
[ 75%] Built target formatter_ex_lib
Scanning dependencies of target solver
[ 87%] Building CXX object CMakeFiles/solver.dir/equation.cpp.o
[100%] Linking CXX executable solver
[100%] Built target solver
```

```
[100%] Built target solver
tim@tim-VirtualBox:~/labs/lab3/lab03/solver_application$ ./solver
3
5
2
-------------------------
x1 = -1.000000
-------------------------
-------------------------
x2 = -0.666667
-------------------------
```

```
tim@tim-VirtualBox:~/labs/lab3/lab03/solver_application$ git add CMakeLists.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/solver_application$ git commit -m "added CMakeLists.txt slvr"
[master ad6f8cd] added CMakeLists.txt slvr
 1 file changed, 16 insertions(+)
 create mode 100644 solver_application/CMakeLists.txt
tim@tim-VirtualBox:~/labs/lab3/lab03/solver_application$ git push origin master
Username for 'https://github.com': Teemo37
Password for 'https://Teemo37@github.com':
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.
Delta compression using up to 4 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (4/4), 621 bytes | 621.00 KiB/s, done.
Total 4 (delta 1), reused 0 (delta 0)
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/Teemo37/lab03.git
   347f7da..ad6f8cd  master -> master
```