

Ministerul Educației Tineretului și Sportului

Universitatea Tehnică a Moldovei

Catedra Tehnologii Informaționale

Raport

La lucrarea de laborator nr.2 la
Medii interactive de dezvoltare a produselor soft

A efectuat st.gr 144:

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A verificat: doctor, conf. univ:

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Chișinau 2016

Tema: Version Control Systems si modul de setare a unui server

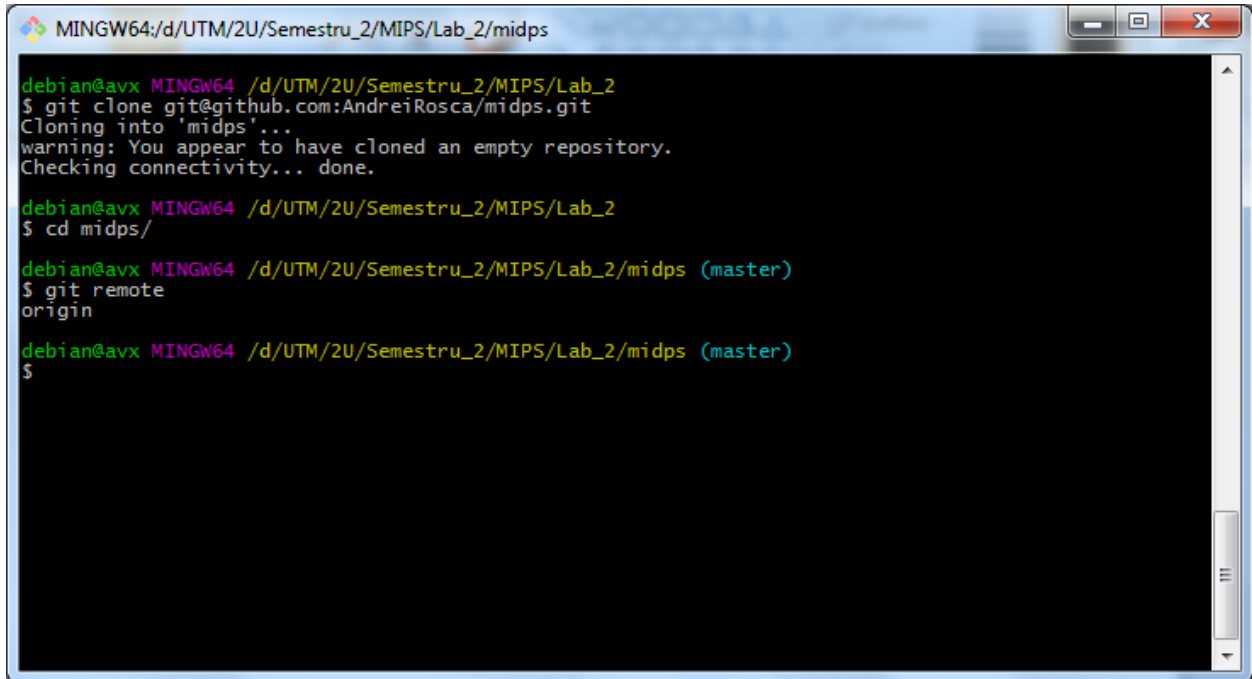
Scopul lucrarii:

- Intelegerea si folosirea CLI (basic level)
- Administrarea remote a masinilor linux machine folosind SSH (remote code editing)
- Version Control Systems (git || mercurial || svn)
- Compileaza codul C/C++/Java/Python prin intermediul CLI, folosind compilatoarele gcc/g++/javac/python

Laboratory Requirements:

- *Basic Level* (nota 5 || 6) :
 - conecteaza-te la server folosind SSH
 - compileaza cel putin 2 sample programs din setul HelloWorldPrograms folosind CLI
 - executa primul commit folosind VCS
- *Normal Level* (nota 7 || 8):
 - initializeaza un nou repository
 - configureaza-ti VCS
 - crearea branch-urilor (creeaza cel putin 2 branches)
 - commit pe ambele branch-uri (cel putin 1 commit per branch)
- *Advanced Level* (grade 9 || 10):
 - seteaza un branch to track a remote origin pe care vei putea sa faci push (ex. Github, Bitbucket or custom server)
 - reseteaza un branch la commit-ul anterior
 - merge 2 branches
 - conflict solving between 2 branches
- *Bonus Point*:
 - Scrie un script care va compila HelloWorldPrograms projects. [vezi lista](#)

- *Basic Level* :
 - conecteaza-te la server folosind SSH
 - `git clone git@github.com:AndreiRosca/midps.git`



The screenshot shows a terminal window titled 'MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps'. The terminal output is as follows:

```
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2
$ git clone git@github.com:AndreiRosca/midps.git
Cloning into 'midps'...
warning: You appear to have cloned an empty repository.
Checking connectivity... done.

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2
$ cd midps/

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git remote
origin

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$
```

- compileaza cel putin 2 sample programs din setul HelloWorldPrograms folosind CLI
 - `javac ./IDE/HelloWorldPrograms/java/hello.java`
 - `gcc -Wall -std=c99 -o ./IDE/HelloWorldPrograms/c/hello.exe ./IDE/HelloWorldPrograms/c/hello.c`
 - `g++ -Wall -std=c++11 -o ./IDE/HelloWorldPrograms/cpp/a.exe ./IDE/HelloWorldPrograms/cpp/hello.cpp`

```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git clone git@github.com:TUM-FAF/IDE.git
Cloning into 'IDE'...
remote: Counting objects: 297, done.
remote: Total 297 (delta 0), reused 0 (delta 0), pack-reused 297
Receiving objects: 100% (297/297), 68.13 KiB | 0 bytes/s, done.
Resolving deltas: 100% (163/163), done.
Checking connectivity... done.

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ gcc -Wall -std=c99 -o ./IDE/HelloWorldPrograms/c/hello.exe ./IDE/HelloWorldPrograms/c/hello.c

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ g++ -Wall -std=c++11 -o ./IDE/HelloWorldPrograms/cpp/a.exe ./IDE/HelloWorldPrograms/cpp/hello.cpp

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ javac ./IDE/HelloWorldPrograms/java/hello.java

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$
```

- executa primul commit folosind VCS

- git add README.MD
- git commit -m "Initial repository"

```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ cat > README.MD
This is a learning project

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git status
On branch master

Initial commit

Untracked files:
  (use "git add <file>..." to include in what will be committed)

    IDE/
    README.MD

nothing added to commit but untracked files present (use "git add" to track)

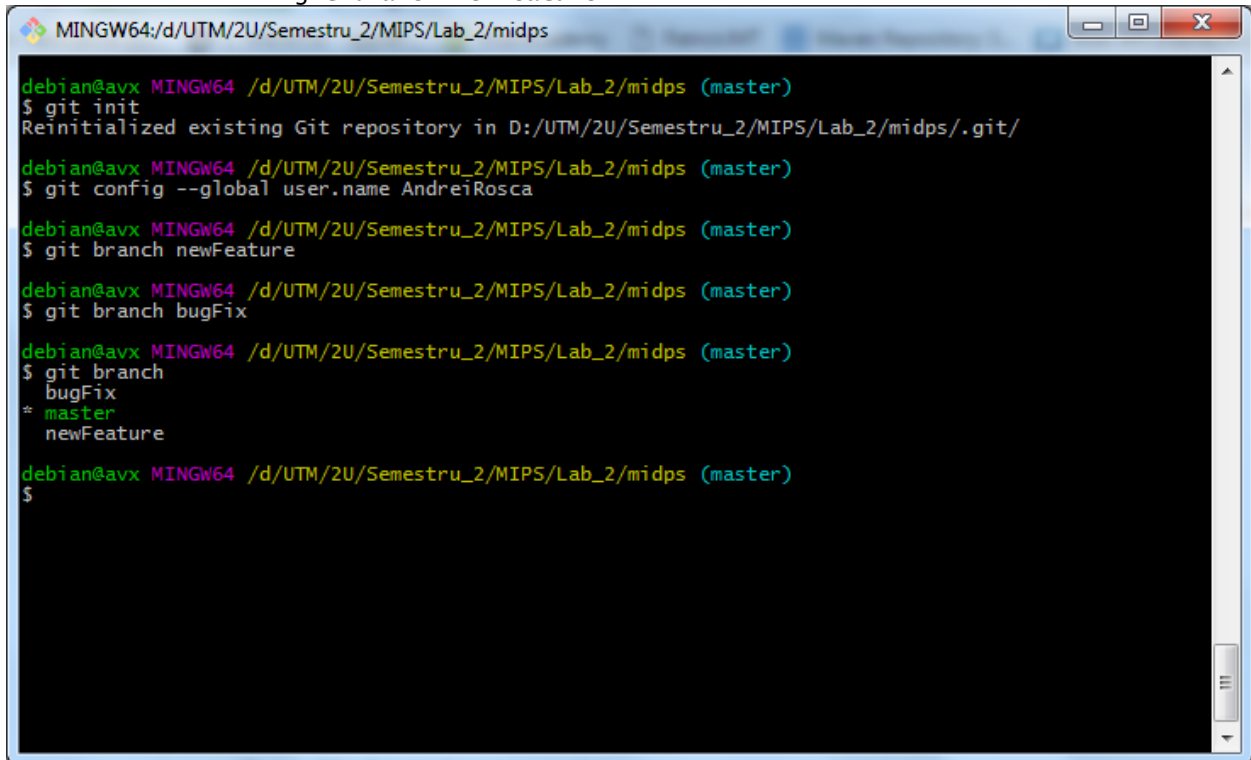
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git add README.MD
warning: LF will be replaced by CRLF in README.MD.
The file will have its original line endings in your working directory.

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git commit -m "Initial repository"
[master (root-commit) 6ec40f8] Initial repository
warning: LF will be replaced by CRLF in README.MD.
The file will have its original line endings in your working directory.
1 file changed, 1 insertion(+)
create mode 100644 README.MD

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ |
```

- *Normal Level:*

- initializeaza un nou repository
 - `git init`
- configureaza-ti VCS
 - `git config --global user.name AndreiRosca`
- crearea branch-urilor (creeaza cel putin 2 branches)
 - `git branch bugFix`
 - `git branch newFeature`



```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git init
Reinitialized existing Git repository in D:/UTM/2U/Semestru_2/MIPS/Lab_2/midps/.git/
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git config --global user.name AndreiRosca
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git branch newFeature
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git branch bugFix
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git branch
  bugFix
* master
  newFeature
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$
```

- commit pe ambele branch-uri (cel putin 1 commit per branch)
 - `git checkout bugFix`
 - `git add main.c`
 - `git commit -m "Added main.c"`
 - `git checkout newFeature`
 - `git add index.html`
 - `git commit -m "Modified index.html"`

```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature)
$ git add main.c
warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature)
$ git commit -m "Added main.c"
[newFeature a6608a3] Added main.c
warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
1 file changed, 3 insertions(+)
create mode 100644 main.c

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature)
$ git checkout bugFix
Switched to branch 'bugFix'

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (bugFix)
$ echo "<b/>" >> index.html

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (bugFix)
$ git add index.html
warning: LF will be replaced by CRLF in index.html.
The file will have its original line endings in your working directory.

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (bugFix)
$ git commit -m "Modified index.html"
[bugFix 5a0782d] Modified index.html
warning: LF will be replaced by CRLF in index.html.
The file will have its original line endings in your working directory.
1 file changed, 1 insertion(+)
create mode 100644 index.html

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (bugFix)
$ |
```

- *Advanced Level:*
 - seteaza un branch to track a remote origin pe care vei putea sa faci push
 - `git checkout -b trackingBranch origin/master`
 - reseteaza un branch la commit-ul anterior
 - `git reset --hard HEAD^`

```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git checkout -b trackingBranch origin/master
Branch trackingBranch set up to track remote branch master from origin.
Switched to a new branch 'trackingBranch'

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (trackingBranch)
$ git log -2
commit f10e3d96715060750408aa8d0335ef21c611962c
Author: AndreiRoshca <speculum@mail.com>
Date: Sat Feb 27 19:45:11 2016 +0200

    Added .gitignore and IDE folder to the repository

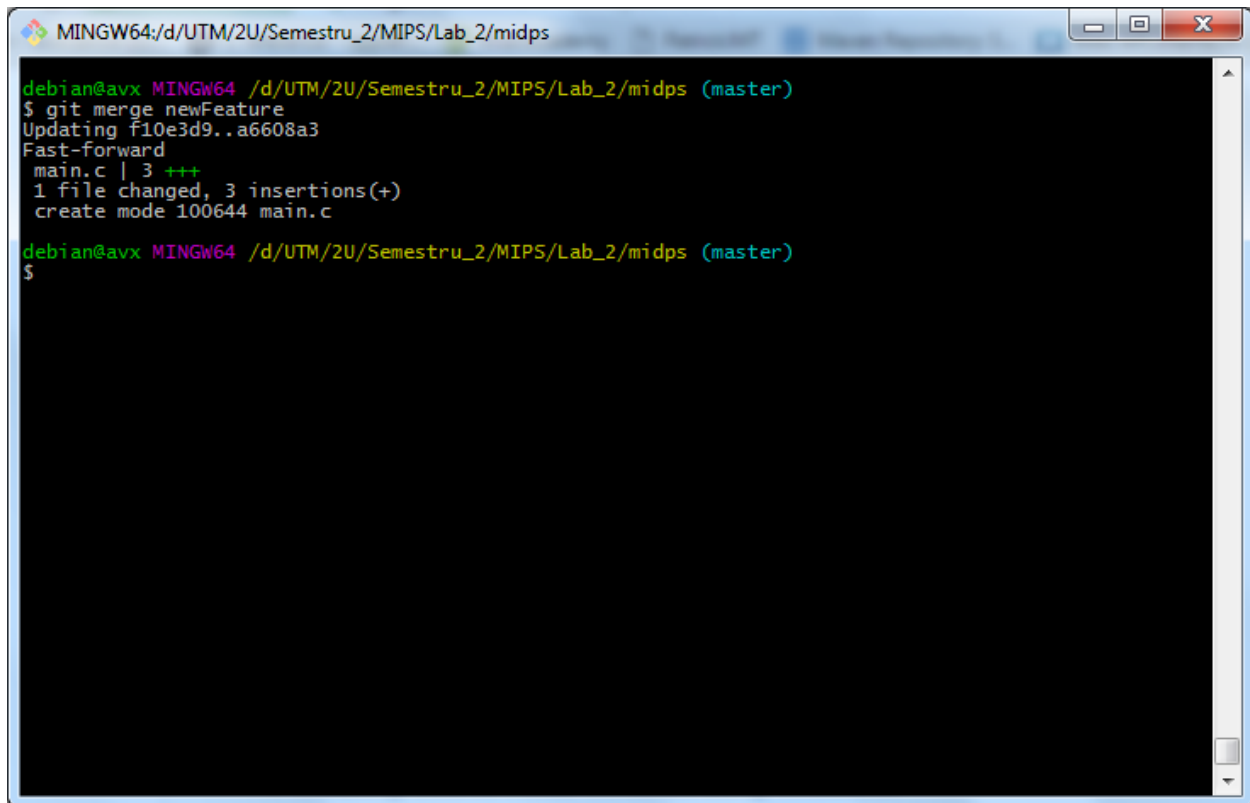
commit 6ec40f891e23188b8ebbf8056c5dc5494d215945
Author: AndreiRoshca <speculum@mail.com>
Date: Sat Feb 27 19:43:31 2016 +0200

    Initial repository

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (trackingBranch)
$ git reset --hard HEAD^
warning: unable to rmdir IDE: Directory not empty
HEAD is now at 6ec40f8 Initial repository

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (trackingBranch)
$
```

- merge 2 branches
 - git merge bugFix
 - git merge newFeature

A screenshot of a terminal window titled 'MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps'. The terminal shows a user performing a git merge. The prompt is 'debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)'. The user enters '\$ git merge newFeature'. The output shows 'Updating f10e3d9..a6608a3', 'Fast-forward', and a diff for 'main.c' showing 3 insertions. The final prompt is '\$'.

```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git merge newFeature
Updating f10e3d9..a6608a3
Fast-forward
 main.c | 3 +++
 1 file changed, 3 insertions(+)
 create mode 100644 main.c
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$
```

- conflict solving between 2 branches
 - git merge master
 - git mergetool
 - git commit -m "Solved the merge conflict"


```
MINGW64:/d/UTM/2U/Semestru_2/MIPS/Lab_2/midps
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ echo "void print() {}" >> main.c

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git commit -am "Modified main.c"
warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
[master warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
42a164f] Modified main.c
warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
1 file changed, 1 insertion(+)

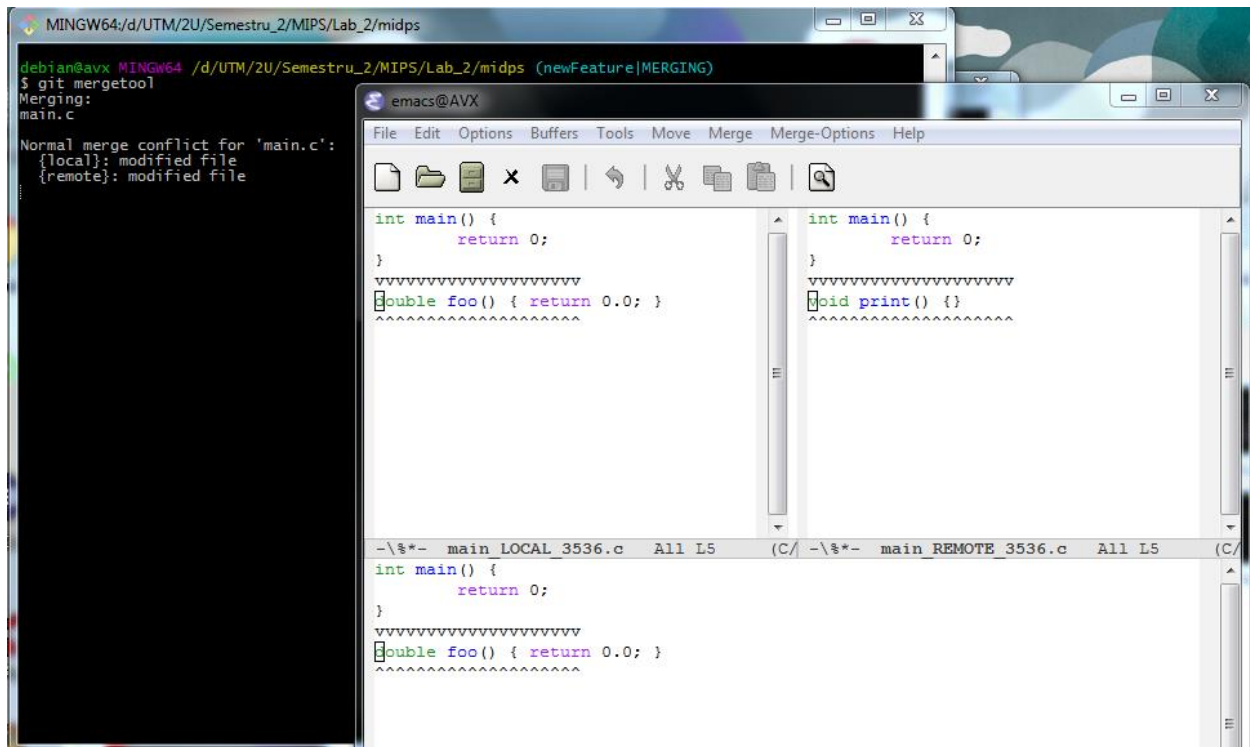
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (master)
$ git checkout newFeature
M      IDE
Switched to branch 'newFeature'

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature)
$ echo "double foo() { return 0.0; }" >> main.c

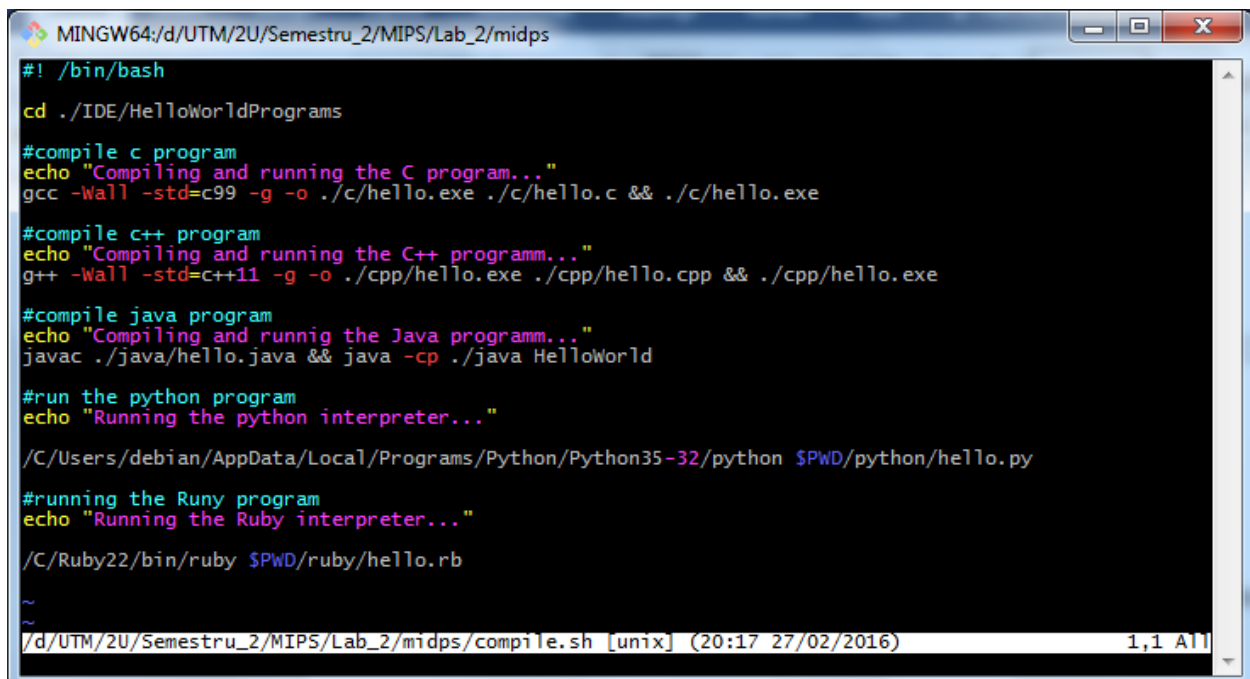
debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature)
$ git commit -am "Also modified main.c"
warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
[newFeature warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
e75f890] Also modified main.c
warning: LF will be replaced by CRLF in main.c.
The file will have its original line endings in your working directory.
1 file changed, 1 insertion(+)

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature)
$ git merge master
Auto-merging main.c
CONFLICT (content): Merge conflict in main.c
Automatic merge failed; fix conflicts and then commit the result.

debian@avx MINGW64 /d/UTM/2U/Semestru_2/MIPS/Lab_2/midps (newFeature|MERGING)
$
```



- *Bonus Point:*
 - Scribe un script care va compila HelloWorldPrograms project



Concluzii

În urma efectuării acestei lucrări de laborator au fost obținute deprinderi practice de lucru cu git – unul din cele mai populare DVCS. Am ajuns la concluzia că un VCS este un instrument indispensabil lucrului în echipă. Am observat că în git, lucru cu branch-urile se face cu mult mai simplu decât în alte VSC-uri cum ar fi svn. Un lucru plăcut despre git este viteza și eficiența lui. Repository-urile git-ului ocupă mai puțin loc decât cele ale lui svn, și că git este distribuit, deci nu este nevoie de a fi mereu conectat la rețea.