1. Установка Git:

```
C:\253503_MINICH_17>git config --global user.email "imsvetam@mail.ru"

C:\253503_MINICH_17>git config --global user.name "Svetlana Minich"

C:\253503_MINICH_17>git config --list
diff.astextplain.textconv=astextplain
filter.lfs.clean=git-lfs clean -- %f
filter.lfs.smudge=git-lfs smudge -- %f
filter.lfs.process=git-lfs filter-process
filter.lfs.required=true
http.sslbackend=openssl
http.sslcainfo=C:/Program Files/Git/mingw64/etc/ssl/certs/ca-bundle.crt
core.autocrlf=true
core.fscache=true
core.symlinks=false
pull.rebase=false
credential.helper=manager
credential.https://dev.azure.com.usehttppath=true
init.defaultbranch=master
safe.directory=C:/253503_MINICH_17
user.email=imsvetam@mail.ru
user.name=Svetlana Minich
core.repositoryformatversion=0
core.filemode=false
core.bare=false
core.logallrefupdates=true
core.symlinks=false
core.ignorecase=true
```

2. Создать структуру папок и поместить в репозиторий Git на своем локальном компьютере:

```
C:\253503_MINICH_17>tree
Folder PATH listing
Volume serial number is 1826-E856
C:.
├───avs
├───igi
│   ├───LR1
│   ├───LR2
│   ├───LR3
│   ├───LR4
│   └───LR5
├───isp
├───oop
└───strweb
    ├───LR1
    ├───LR2
    ├───LR3
    └───LR4
```

```
C:\253503_MINICH_17>git init
Initialized empty Git repository in C:/253503_MINICH_17/.git/
```

3. Создать репозиторий в LR1 с помощью клонирования репозитория:

```
C:\253503_MINICH_17\igi\LR1>git clone https://github.com/smartiqaorg/geometric_lib
Cloning into 'geometric_lib'...
remote: Enumerating objects: 35, done.
remote: Total 35 (delta 0), reused 0 (delta 0), pack-reused 35
Receiving objects: 100% (35/35), 4.60 KiB | 4.60 MiB/s, done.
Resolving deltas: 100% (6/6), done.
```

4. a. Сделать индексацию нескольких файлов в моем Git репозитории:

```
C:\253503_MINICH_17>git add .

C:\253503_MINICH_17>git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:    igi/LR1/geometric_lib
        new file:    igi/LR2/a.txt
        new file:    igi/LR3/b.txt
        new file:    igi/LR4/c.txt
        new file:    igi/LR5/d.txt
        new file:    strweb/LR1/e.txt
        new file:    strweb/LR2/f.txt
        new file:    strweb/LR3/g.txt
        new file:    strweb/LR4/h.txt
```

b. Внести изменения в файлы:

```
C:\253503_MINICH_17>git status
On branch master

No commits yet

Changes to be committed:
  (use "git rm --cached <file>..." to unstage)
        new file:    igi/LR1/geometric_lib
        new file:    igi/LR2/a.txt
        new file:    igi/LR3/b.txt
        new file:    igi/LR4/c.txt
        new file:    igi/LR5/d.txt
        new file:    strweb/LR1/e.txt
        new file:    strweb/LR2/f.txt
        new file:    strweb/LR3/g.txt
        new file:    strweb/LR4/h.txt

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   igi/LR2/a.txt
```

c. Выполнить коммиты к проиндексированным файлам:

```
C:\253503_MINICH_17>git commit -m "first"
[master (root-commit) 818191b] first
 9 files changed, 10 insertions(+)
 create mode 160000 igi/LR1/geometric_lib
 create mode 100644 igi/LR2/a.txt
 create mode 100644 igi/LR3/b.txt
 create mode 100644 igi/LR4/c.txt
 create mode 100644 igi/LR5/d.txt
 create mode 100644 strweb/LR1/e.txt
 create mode 100644 strweb/LR2/f.txt
 create mode 100644 strweb/LR3/g.txt
 create mode 100644 strweb/LR4/h.txt

C:\253503_MINICH_17>git status
On branch master
nothing to commit, working tree clean
```

d. Добавить и удалить файлы:

```
C:\253503_MINICH_17\igi\LR1>git add a.txt

C:\253503_MINICH_17\igi\LR1>git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   a.txt

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


C:\253503_MINICH_17\igi\LR1>git add *.txt

C:\253503_MINICH_17\igi\LR1>git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   a.txt
        new file:   b.txt
        new file:   c.txt
```

```
C:\253503_MINICH_17\igi\LR1>git rm a.txt
error: the following file has changes staged in the index:
    igi/LR1/a.txt
(use --cached to keep the file, or -f to force removal)

C:\253503_MINICH_17\igi\LR1>git rm -f a.txt
rm 'igi/LR1/a.txt'

C:\253503_MINICH_17\igi\LR1>git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   b.txt
        new file:   c.txt


C:\253503_MINICH_17\igi\LR1>git rm -f *.txt
rm 'igi/LR1/b.txt'
rm 'igi/LR1/c.txt'

C:\253503_MINICH_17\igi\LR1>git status
On branch master
nothing to commit, working tree clean
```

e. Переименуйте файлы:

```
C:\253503_MINICH_17\igi\LR1>git mv a.txt A.txt

C:\253503_MINICH_17\igi\LR1>git status
On branch master
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   A.txt
```

f. Создайте для IGI и STRWEB, а также для каждой ЛР, вложенной в них, отдельные ветки, переместите папки и файлы на соответствующие ветки:

```
C:\253503_MINICH_17>git branch -v
* igi        818191b first
  igi-lr1    36e6475 igi-lr1
  igi-lr2    d7bb77e igi-lr2
  igi-lr3    e00f4e9 igi-lr3
  igi-lr4    a67415c igi-lr4
  igi-lr5    16fe7c7 igi-lr5
  master     818191b first
  strweb     818191b first
  strweb-lr1 0ba8348 strweb-lr1
  strweb-lr2 ef00c40 strweb-lr2
  strweb-lr3 528ebfc strweb-lr3
  strweb-lr4 7b4bdcf strweb-lr4
```

g. Выведите историю коммитов: полностью и с ограничением вывода – отобрать только последние, до и после указанной даты, по автору файлов, коммитов (флаги n, since, after, until, before, author, committer, grep):

```
C:\253503_MINICH_17>git log --all
commit 7b4bdcf6f85cf6006419ef7710125b0e20540e12 (strweb-lr4)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:56:04 2024 +0300

    strweb-lr4

commit 528ebfcd0bb039a8963d50aa85c15c3675d356fc (strweb-lr3)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:55:32 2024 +0300

    strweb-lr3

commit ef00c40c70551b57afb9adadf94c9ae3ae611016 (strweb-lr2)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:54:52 2024 +0300

    strweb-lr2

commit 0ba8348a599bc002253b2050fa6f4ed64ba8bf22 (strweb-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:54:19 2024 +0300

    strweb-lr1
```

```
C:\253503_MINICH_17>git checkout igi-lr1
Switched to branch 'igi-lr1'

C:\253503_MINICH_17>git log -2
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:40:53 2024 +0300

    first

C:\253503_MINICH_17>git log -1
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1
```

```
C:\253503_MINICH_17>git log --since="2024-02-23"
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:40:53 2024 +0300

    first

C:\253503_MINICH_17>git log --until="2024-02-23"

C:\253503_MINICH_17>
```

```
C:\253503_MINICH_17>git log --author="Svetlana Minich"
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:40:53 2024 +0300

    first
```

```
C:\253503_MINICH_17>git log --committer="Svetlana Minich"
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:40:53 2024 +0300

    first
```

```
C:\253503_MINICH_17>git log --grep "igi"
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1
```

h. Исследуйте флаги для git log: p , stat ,shortstat, name-only, name-status, relative-date, pretty, graph:

```
C:\253503_MINICH_17>git log -p
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

diff --git a/igi/LR1/A.txt b/igi/LR1/A.txt
new file mode 100644
index 0000000..7898192
--- /dev/null
+++ b/igi/LR1/A.txt
@@ -0,0 +1 @@
+a

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:40:53 2024 +0300

    first
```

```
C:\253503_MINICH_17>git log --stat
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

 igi/LR1/A.txt | 1 +
 1 file changed, 1 insertion(+)

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   Sat Feb 24 18:40:53 2024 +0300

    first

 igi/LR1/geometric_lib | 1 +
 igi/LR2/a.txt         | 2 ++
 igi/LR3/b.txt         | 1 +
 igi/LR4/c.txt         | 1 +
 igi/LR5/d.txt         | 1 +
 strweb/LR1/e.txt      | 1 +
 strweb/LR2/f.txt      | 1 +
 strweb/LR3/g.txt      | 1 +
 strweb/LR4/h.txt      | 1 +
 9 files changed, 10 insertions(+)
```

```
C:\253503_MINICH_17>git log --shortstat
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:    Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

 1 file changed, 1 insertion(+)

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:    Sat Feb 24 18:40:53 2024 +0300

    first

 9 files changed, 10 insertions(+)
```

```
C:\253503_MINICH_17>git log --name-only
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:    Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

igi/LR1/A.txt

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:    Sat Feb 24 18:40:53 2024 +0300

    first

igi/LR1/geometric_lib
igi/LR2/a.txt
igi/LR3/b.txt
igi/LR4/c.txt
igi/LR5/d.txt
strweb/LR1/e.txt
strweb/LR2/f.txt
strweb/LR3/g.txt
strweb/LR4/h.txt
```

```
C:\253503_MINICH_17>git log --name-status
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:    Sat Feb 24 18:49:49 2024 +0300

    igi-lr1

A       igi/LR1/A.txt

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:    Sat Feb 24 18:40:53 2024 +0300

    first

A       igi/LR1/geometric_lib
A       igi/LR2/a.txt
A       igi/LR3/b.txt
A       igi/LR4/c.txt
A       igi/LR5/d.txt
A       strweb/LR1/e.txt
A       strweb/LR2/f.txt
A       strweb/LR3/g.txt
A       strweb/LR4/h.txt
```

```
C:\253503_MINICH_17>git log --relative-date
commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   22 hours ago

    igi-lr1

commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
Author: Svetlana Minich <imsvetam@mail.ru>
Date:   22 hours ago

    first
```

```
C:\253503_MINICH_17>git log --pretty=oneline
36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1) igi-lr1
818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi) first
```

```
C:\253503_MINICH_17>git log --graph
* commit 36e64757c65f04c43bd635c806d24cedb270bc58 (HEAD -> igi-lr1)
| Author: Svetlana Minich <imsvetam@mail.ru>
| Date:   Sat Feb 24 18:49:49 2024 +0300
|
|       igi-lr1
|
* commit 818191bba11973636d2341a7cdcf5ab8593f2092 (strweb, master, igi)
  Author: Svetlana Minich <imsvetam@mail.ru>
  Date:   Sat Feb 24 18:40:53 2024 +0300

        first
```

i. Найдите разницу в изменениях для каждого коммита:

```
C:\253503_MINICH_17\igi\LR1>git log -2 --pretty=oneline
0df2f20ba750376750d66dcd11ba364f416b8e02 (HEAD -> igi-lr1) d.txt deleted
8d2cad8aa438455fc80480c5c615f2b7bc9ca05b adding d.txt

C:\253503_MINICH_17\igi\LR1>git diff 0df2f20ba750376750d66dcd11ba364f416b8e02 8d2cad8aa438455fc80480c5c615f2b7bc9ca05b
diff --git a/igi/LR1/d.txt b/igi/LR1/d.txt
new file mode 100644
index 0000000..7898192
--- /dev/null
+++ b/igi/LR1/d.txt
@@ -0,0 +1 @@
+a
```

j. Создайте новый файл test.txt и вставьте в него строчку 'номер
варианта'. затем сделайте коммит и отмените его:

```
C:\253503_MINICH_17>git branch -v
  igi        818191b first
* igi-lr1    6b4c197 test_file
  igi-lr2    d7bb77e igi-lr2
  igi-lr3    e00f4e9 igi-lr3
  igi-lr4    a67415c igi-lr4
  igi-lr5    16fe7c7 igi-lr5
  master     818191b first
  strweb     818191b first
  strweb-lr1 0ba8348 strweb-lr1
  strweb-lr2 ef00c40 strweb-lr2
  strweb-lr3 528ebfc strweb-lr3
  strweb-lr4 7b4bdcf strweb-lr4

C:\253503_MINICH_17>git reset HEAD~

C:\253503_MINICH_17>git branch -v
  igi        818191b first
* igi-lr1    0df2f20 d.txt deleted
  igi-lr2    d7bb77e igi-lr2
  igi-lr3    e00f4e9 igi-lr3
  igi-lr4    a67415c igi-lr4
  igi-lr5    16fe7c7 igi-lr5
  master     818191b first
  strweb     818191b first
  strweb-lr1 0ba8348 strweb-lr1
  strweb-lr2 ef00c40 strweb-lr2
  strweb-lr3 528ebfc strweb-lr3
  strweb-lr4 7b4bdcf strweb-lr4
```

k. Проиндексируйте файл в вашем Git-репозитории, затем отмените его индексацию:

```
C:\253503_MINICH_17\igi\LR1>git add d.txt test.txt

C:\253503_MINICH_17\igi\LR1>git status
On branch igi-lr1
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   d.txt
        new file:   test.txt

C:\253503_MINICH_17\igi\LR1>git rm d.txt
error: the following file has changes staged in the index:
    igi/LR1/d.txt
(use --cached to keep the file, or -f to force removal)

C:\253503_MINICH_17\igi\LR1>git rm -f d.txt
rm 'igi/LR1/d.txt'

C:\253503_MINICH_17\igi\LR1>git status
On branch igi-lr1
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   test.txt
```

l. Внесите изменения в файл в вашем Git-репозитории и затем верните его в исходное состояние:

```
C:\253503_MINICH_17\igi\LR1>git status
On branch igi-lr1
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   test.txt

Changes not staged for commit:
  (use "git add <file>..." to update what will be committed)
  (use "git restore <file>..." to discard changes in working directory)
        modified:   test.txt


C:\253503_MINICH_17\igi\LR1>git restore test.txt

C:\253503_MINICH_17\igi\LR1>git status
On branch igi-lr1
Changes to be committed:
  (use "git restore --staged <file>..." to unstage)
        new file:   test.txt
```

5. a. Создайте удаленный репозиторий (на github.com):

```
C:\253503_MINICH_17>git remote add origin https://github.com/SvetlanaMinich/253503_MINICH_17.git

C:\253503_MINICH_17>git push origin --all
Enumerating objects: 44, done.
Counting objects: 100% (44/44), done.
Delta compression using up to 8 threads
Compressing objects: 100% (32/32), done.
Writing objects: 100% (33/33), 2.42 KiB | 2.42 MiB/s, done.
Total 33 (delta 12), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (12/12), completed with 2 local objects.
To https://github.com/SvetlanaMinich/253503_MINICH_17.git
 * [new branch]      igi-lr2 -> igi-lr2
 * [new branch]      igi-lr3 -> igi-lr3
 * [new branch]      igi-lr4 -> igi-lr4
 * [new branch]      igi-lr5 -> igi-lr5
 * [new branch]      strweb -> strweb
 * [new branch]      strweb-lr1 -> strweb-lr1
 * [new branch]      strweb-lr2 -> strweb-lr2
 * [new branch]      strweb-lr3 -> strweb-lr3
 * [new branch]      strweb-lr4 -> strweb-lr4
```

b. Просмотрите информацию о нем, внесите изменения и опять просмотрите (remote, fetch):

```
C:\253503_MINICH_17>git remote show
origin

C:\253503_MINICH_17>git remote rename main
usage: git remote rename [--[no-]progress] <old> <new>

    --[no-]progress       force progress reporting


C:\253503_MINICH_17>git remote rename origin origin1

C:\253503_MINICH_17>git remote show
origin1
```

```
C:\253503_MINICH_17>git fetch --all

C:\253503_MINICH_17>git fetch origin
fatal: 'origin' does not appear to be a git repository
fatal: Could not read from remote repository.

Please make sure you have the correct access rights
and the repository exists.

C:\253503_MINICH_17>git fetch origin1

C:\253503_MINICH_17>git fetch
```

c. Измените несколько файлов в вашем проекте и перенесите их в удаленный репозиторий:

```
C:\253503_MINICH_17>git commit -m "changes"
[igi-lr1 d6f99c8] changes
 2 files changed, 2 insertions(+)
 create mode 100644 igi/LR1/q.txt
 create mode 100644 igi/LR1/test.txt

C:\253503_MINICH_17>git status
On branch igi-lr1
nothing to commit, working tree clean

C:\253503_MINICH_17>git puch -u origin1 master
git: 'puch' is not a git command. See 'git --help'.

The most similar command is
        push

C:\253503_MINICH_17>git push -u origin1 master
info: please complete authentication in your browser...
Enumerating objects: 15, done.
Counting objects: 100% (15/15), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (15/15), 901 bytes | 901.00 KiB/s, done.
Total 15 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/SvetlanaMinich/253503_MINICH_17.git
 * [new branch]      master -> master
branch 'master' set up to track 'origin1/master'.
```

d. Переименуйте свой удаленный репозиторий:

е. Получите данные из удаленного репозитория:

6. Индивидуальное задание: