1. create a new directory add make a structure

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ touch main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ mkdir math_lib
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ cd math_lib
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ mkdir src inc
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ cd src
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/src$ touch math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/src$ cd ..
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ cd inc
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ touch math_lib.h
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ [
```

2.Init git repo from [git home work]

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git init
hint: Using 'master' as the name for the initial branch. This default branch name
hint: is subject to change. To configure the initial branch name to use in all
hint: of your new repositories, which will suppress this warning, call:
hint:
hint: git config --global init.defaultBranch <name>
hint:
hint: Names commonly chosen instead of 'master' are 'main', 'trunk' and
hint: 'development'. The just-created branch can be renamed via this command:
hint:
hint: git branch -m <name>
Initialized empty Git repository in /home/nazariiyatsuk/git_hw/.git/
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$
```

3. Create in master branch first commit with described above project structure

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add .
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit -m "a new structure"
[master (root-commit) 81bce5d] a new structure
4 files changed, 1 insertion(+)
create mode 100644 Makefile
create mode 100644 main.c
create mode 100644 math_lib/inc/math_lib.h
create mode 100644 math_lib/src/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$
```

4.Add the empty main function to "main.c" file. Do the commit

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit -m "added an empty func"
[master 0f912fc] added an empty func
1 file changed, 1 insertion(+), 1 deletion(-)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ [
```

5.Create the first dev branch - based on master Go back to master branch and add to main function the following line of code: "printf("Hello, world!\n"); ", do the commit

```
int main() { return 0; }
printf("Hello, world!\n");
```

```
1 file changed, 1 insertion(+), 1 deletion(-)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout -b dev1
Switched to a new branch 'dev1'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout master
Switched to branch 'master'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit -m "added a printf"
[master 3928dec] added a printf
1 file changed, 3 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ [
```

6.Create the second dev branch - based on master Got back to master branch and change the message in "printf" function to any other (whatever you want) and ammend it to the last commit.

```
int main() { return 0; }
printf("Hello!\n");
```

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout -b dev2
Switched to a new branch 'dev2'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout master
Switched to branch 'master'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit --amend -m "changed printf"
[master 4a29c33] changed printf
Date: Wed Oct 22 13:47:18 2025 +0300
1 file changed, 3 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ []
```

7. On branch 1 - add 2 functions to lib (any that you want) 1 function - 1 commit (any function - can be even empty implementation)

```
void func1() {}

void func2() {}
~
~
~
```

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout dev1
Switched to branch 'dev1'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ cd math_lib
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ cd inc
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added first func"
[dev1 e2740f5] added first func
1 file changed, 1 insertion(+)
create mode 100644 math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added second func"
[dev1 5f82fba] added second func
1 file changed, 3 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ [
```

8.On branch 2 - add 2 functions to lib (any that you want) 1 function - 1 commit (any function - can be even empty implementation)

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git checkout dev2
Switched to branch 'dev2'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added third func"
[dev2 0739f86] added third func
1 file changed, 1 insertion(+)
    create mode 100644 math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added fourth func"
[dev2 5f265c1] added fourth func
1 file changed, 2 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ [
```

9.Merge dev branch 1 to master using fast-forward merge

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git checkout dev1
Switched to branch 'dev1'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git rebase master
Successfully rebased and updated refs/heads/dev1.
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git checkout master
Switched to branch 'master'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git merge dev1
Updating 4a29c33..e5ba40e
Fast-forward
math_lib/inc/math_lib.c | 4 ++++
1 file changed, 4 insertions(+)
create mode 100644 math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ [
```

10. Merge dev branch 2 to master using merge with merge commit

```
<<<<< HEAD
void func1() {}

void func2() {}

======
void func3() {}

void func4() {}

>>>>>> dev2
```

```
int main() { return 0; }

<<<<< HEAD
printf("Hello!\n");
======
printf("Hello, world!\n");
>>>>> dev2
```

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git merge dev2 --no-ff -m "Merge dev2 "
Auto-merging main.c
CONFLICT (content): Merge conflict in main.c

Auto-merging math_lib/inc/math_lib.c

CONFLICT (add/add): Merge conflict in math_lib/inc/math_lib.c

Automatic merge failed; fix conflicts and then commit the result.
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ cd ..
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ cd ..
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c /math_lib/inc/math_lib.c
fatal: Invalid path '/math_lib': No such file or directory
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ ls
main.c Makefile math_lib
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git status
On branch master
All conflicts fixed but you are still merging.
   (use "git commit" to conclude merge)
Changes to be committed:
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit
[master 779b22c] Merge dev2
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$
```

11. After merging branches to master, try to remove from master branch 2 latest commits

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git reset --hard HEAD~2
HEAD is now at e186f4f added first func
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$
```

12. Upload you project to your github

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git remote
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git remote add origin git@github.com:fairy2853/git_hw.git
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git push origin master
Enumerating objects: 18, done.
Counting objects: 100% (18/18), done.
Delta compression using up to 16 threads
Compressing objects: 100% (11/11), done.
Writing objects: 100% (18/18), 1.45 KiB | 1.45 MiB/s, done. Total 18 (delta 1), reused 0 (delta 0), pack-reused 0 remote: Resolving deltas: 100% (1/1), done.
To github.com:fairy2853/git_hw.git
                              master -> master
 * [new branch]
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git push origin dev1 dev2
Enumerating objects: 27, done.
Counting objects: 100% (27/27), done.
Delta compression using up to 16 threads
Compressing objects: 100% (15/15), done.
Writing objects: 100% (18/18), 1.49 KiB | 760.00 KiB/s, done.
Total 18 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), completed with 1 local object.
To github.com:fairy2853/git_hw.git
     [new branch]
                               dev1 -> dev1
  * [new branch]
                               dev2 -> dev2
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$
```

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git reflog
e186f4f (HEAD -> master,
                                                 HEAD@{0}: reset: moving to HEAD~2
779b22c HEAD@{1}: commit (merge): Merge dev2
                         , dev1) HEAD@{2}: merge dev1: Fast-forward
4a29c33 HEAD@{3}: checkout: moving from dev1 to master
                       1, dev1) HEAD@{4}: rebase (finish): returning to refs/heads/dev1
1, dev1) HEAD@{5}: rebase (pick): added second func
e5ba40e (
e186f4f (HEAD -> master,
                                                HEAD@{6}: rebase (pick): added first func
4a29c33 HEAD@{7}: rebase (start): checkout master
5f82fba HEAD@{8}: checkout: moving from dev2 to dev1
                         , dev2) HEAD@{9}: commit: added fourth func
0739f86 HEAD@{10}: commit: added third func
3928dec HEAD@\{11\}: checkout: moving from dev1 to dev2 5f82fba HEAD@\{12\}: commit: added second func
e2740f5 HEAD@{13}: commit: added first func
Of912fc HEAD@{14}: checkout: moving from master to dev1
4a29c33 HEAD@{15}: commit (amend): changed printf
3928dec HEAD@{16}: checkout: moving from dev2 to master
3928dec HEAD@{17}: checkout: moving from master to dev2 3928dec HEAD@{18}: commit: added a printf
Of912fc HEAD@{19}: checkout: moving from dev1 to master
0f912fc HEAD@\{20\}: checkout: moving from master to dev1 0f912fc HEAD@\{21\}: commit: added an empty func
81bce5d HEAD@{22}: commit (initial): a new structure nazarityatsuk@pcn-nyatsuk-u:~/git_hw$
```

```
azariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add .
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit -m "a new structure"
[master (root-commit) 81bce5d] a new structure
4 files changed, 1 insertion(+)
create mode 100644 Makefile
create mode 100644 main.c
create mode 100644 math_lib/inc/math_lib.h
create mode 100644 math_lib/src/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit -m "added an empty func"
[master Of912fc] added an empty func
1 file changed, 1 insertion(+), 1 deletion(-)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout -b dev1
Switched to a new branch ' dev1'
nazariiyatsuk@pcn-nyatsuk-u:~/qit_hw$ git checkout master
Switched to branch ' master'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit -m "added a printf"
[master 3928dec] added a printf
1 file changed, 3 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout -b dev2
Switched to a new branch 'dev2'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout master
Switched to branch ' master'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit --amend -m "changed printf"
[master 4a29c33] changed printf
Date: Wed Oct 22 13:47:18 2025 +0300
1 file changed, 3 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git checkout dev1
Switched to branch ' dev1'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ cd math_lib
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ cd inc
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
```

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/qit_hw/math_lib/inc$ qit commit -m "added first
func"
[dev1 e2740f5] added first func
 1 file changed, 1 insertion(+)
 create mode 100644 math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added second
func"
[dev1 5f82fba] added second func
 1 file changed, 3 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git checkout dev2
Switched to branch 'dev2'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added third
func"
[dev2 0739f86] added third func
 1 file changed, 1 insertion(+)
 create mode 100644 math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git add math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git commit -m "added fourth
[dev2 5f265c1] added fourth func
 1 file changed, 2 insertions(+)
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git checkout dev1
Switched to branch ' dev1'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git rebase master
Successfully rebased and updated refs/heads/dev1.
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git checkout master
Switched to branch ' master'
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git merge dev1
Updating 4a29c33..e5ba40e
Fast-forward
 math_lib/inc/math_lib.c | 4 ++++
 1 file changed, 4 insertions(+)
 create mode 100644 math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ git merge dev2 --no-ff -m
"Merge dev2 "
Auto-merging main.c
CONFLICT (content): Merge conflict in main.c
Auto-merging math_lib/inc/math_lib.c
CONFLICT (add/add): Merge conflict in math_lib/inc/math_lib.c
Automatic merge failed; fix conflicts and then commit the result.
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ vim math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib/inc$ cd ...
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw/math_lib$ cd ...
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ vim main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c /math_lib/inc/math_lib.c
fatal: Invalid path '/math_lib': No such file or directory
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add main.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ ls
main.c Makefile math_lib
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git add math_lib/inc/math_lib.c
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git status
On branch master
All conflicts fixed but you are still merging.
  (use "git commit" to conclude merge)
Changes to be committed:
        modified:
```

modified: math lib/inc/math lib.c

```
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git commit
[master 779b22c] Merge dev2
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git reset --hard HEAD~2
HEAD is now at e186f4f added first func
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git remote
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git remote add origin
git@github.com:fairy2853/git_hw.git
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git push origin master
Enumerating objects: 18, done.
Counting objects: 100% (18/18), done.
Delta compression using up to 16 threads
Compressing objects: 100% (11/11), done.
Writing objects: 100% (18/18), 1.45 KiB | 1.45 MiB/s, done.
Total 18 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), done.
To github.com:fairy2853/git_hw.git
 * [new branch]
                     master -> master
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git push origin dev1 dev2
Enumerating objects: 27, done.
Counting objects: 100% (27/27), done.
Delta compression using up to 16 threads
Compressing objects: 100% (15/15), done.
Writing objects: 100% (18/18), 1.49 KiB | 760.00 KiB/s, done.
Total 18 (delta 3), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (3/3), completed with 1 local object.
To github.com:fairy2853/git_hw.git
  [new branch]
                     dev1 -> dev1
 * [new branch]
                     dev2 -> dev2
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$ git reflog
e186f4f (HEAD -> master, origin/master) HEAD@{0}: reset: moving to HEAD~2
779b22c HEAD@{1}: commit (merge): Merge dev2
e5ba40e (origin/dev1, dev1) HEAD@{2}: merge dev1: Fast-forward
4a29c33 HEAD@{3}: checkout: moving from dev1 to master
e5ba40e (origin/dev1, dev1) HEAD@{4}: rebase (finish): returning to
refs/heads/dev1
e5ba40e (origin/dev1, dev1) HEAD@{5}: rebase (pick): added second func
e186f4f (HEAD -> master, origin/master) HEAD@{6}: rebase (pick): added first
4a29c33 HEAD@{7}: rebase (start): checkout master
5f82fba HEAD@{8}: checkout: moving from dev2 to dev1
5f265c1 (origin/dev2, dev2) HEAD@{9}: commit: added fourth func
0739f86 HEAD@{10}: commit: added third func
3928dec HEAD@{11}: checkout: moving from dev1 to dev2
5f82fba HEAD@{12}: commit: added second func
e2740f5 HEAD@{13}: commit: added first func
Of912fc HEAD@{14}: checkout: moving from master to dev1
4a29c33 HEAD@{15}: commit (amend): changed printf
3928dec HEAD@{16}: checkout: moving from dev2 to master
3928dec HEAD@{17}: checkout: moving from master to dev2
3928dec HEAD@{18}: commit: added a printf
0f912fc HEAD@{19}: checkout: moving from dev1 to master
Of912fc HEAD@{20}: checkout: moving from master to dev1
Of912fc HEAD@{21}: commit: added an empty func
81bce5d HEAD@{22}: commit (initial): a new structure
nazariiyatsuk@pcn-nyatsuk-u:~/git_hw$
```