Homeworks Robotics Lab 24/25:

UNIVERSITÀ DEGLI
STUDI DI NAPOLI
FEDERICO II

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Index

Homework 0

The first homework consist basically in an introduction to the basic commands that we will use during the course, so there will be some stuff to do in the Linux shell, some with Git and Docker.
The first point of the first HM consist in doing some operations in the shell, the tasks are these:

1. List the files contained in your home folder

2. List the files contained in your Desktop folder

3. Create a new text file, named as your surname in your home folder

4. Write your name and surname in the file created at step 3 using terminal commands

5. Create the directories `/rl_lab/hmwk0` in your home folder using just one command

6. Move the text file created at step 3 in the `/rl_lab/hmwk0` folder created at the step 5. List the content of the directory

7. Rename the `hmwk0` directory into `hmwk1`

8. Use `grep` command to search your surname into the file created at step 3

9. Change the owner and group of this file into root and root

10. Remove the `rl_lab` directory

11. Check the internet connection of your computer using the linux terminal

12. Create a bash script. The goal of the script is to automatically do the steps from 3 to 9.

13. Change the owner of all the files and directories under `rl_lab`

Homework 0

And the results of the first eleven tasks are those:

Homework 0

Instead, the last two tasks of the first point are done here:


```
arsen@Arsen-PC:~$ nano scripthw0.sh
arsen@Arsen-PC:~$ ls
Documenti        Musica        'rl24fold_3 (copia).zip'   scripthw0.sh
Immagini         proba         rl24folder                 Scrivania
loc_rep_hmwk0    Pubblici      rl24folder_new             snap
Modelli          rl24fold_3    Scaricati                  Video
arsen@Arsen-PC:~$ chmod +x scripthw0.sh
arsen@Arsen-PC:~$ ls
Documenti        Musica        'rl24fold_3 (copia).zip'   scripthw0.sh
Immagini         proba         rl24folder                 Scrivania
loc_rep_hmwk0    Pubblici      rl24folder_new             snap
Modelli          rl24fold_3    Scaricati                  Video
arsen@Arsen-PC:~$ ./scripthw0.sh
Questo è lo script bash dell'hw0
File di testo creato!
Create anche le directory e spostato il file txt in esse!
Adesso ho rinominato una delle directory!
Cerco il cognome dello studente nel file di testo...
Arsen Hudyma
[sudo] password di arsen:
-rw-rw-r-- 1 root root 13 gen 30 18:02 Hudyma.txt
Il compito dello script è finito, ciao ;)
arsen@Arsen-PC:~$ cd rl_lab/
arsen@Arsen-PC:~/rl_lab$ chown -R root hmwk1
chown: cambiamento del proprietario di 'hmwk1/Hudyma.txt': Operazione non permessa
chown: cambiamento del proprietario di 'hmwk1': Operazione non permessa
arsen@Arsen-PC:~/rl_lab$ sudo chown -R root hmwk1
arsen@Arsen-PC:~/rl_lab$ ls -l hmwk1
totale 4
-rw-rw-r-- 1 root root 13 gen 30 18:02 Hudyma.txt
arsen@Arsen-PC:~/rl_lab$
```

```
GNU nano 6.2                    scripthw0.sh *
#!/bin/bash

echo "Questo è lo script bash dell'hw0"

cd
touch Hudyma.txt
echo "Arsen Hudyma" >> Hudyma.txt
echo "File di testo creato!"
mkdir -p rl_lab/hmwk0
mv Hudyma.txt rl_lab/hmwk0
echo "Create anche le directory e spostato il file txt in esse!"
cd rl_lab
mv hmwk0 hmwk1
echo "Adesso ho rinominato una delle directory!"
cd hmwk1
echo "Cerco il cognome dello studente nel file di testo..."
grep "Hudyma" Hudyma.txt
sudo chown root:root Hudyma.txt
ls -l Hudyma.txt
echo "Il compito dello script è finito, ciao ;)"
```

Homework 0

The second point of this homework, consist in managing and learning some Git operations, specifically, here are the tasks to satisfy:

1. Create an account on `www.github.com` (use your preferred e-mail)

2. Create a personal access token

3. Add this token to a local configuration file (to use it when it's needed)

4. Alternatively to authentification through token, generate a SSH key and add it to the ssh-agent (see here)

5. Create a local repository with an `hello_world` source file

6. Create a new public remote repository on github
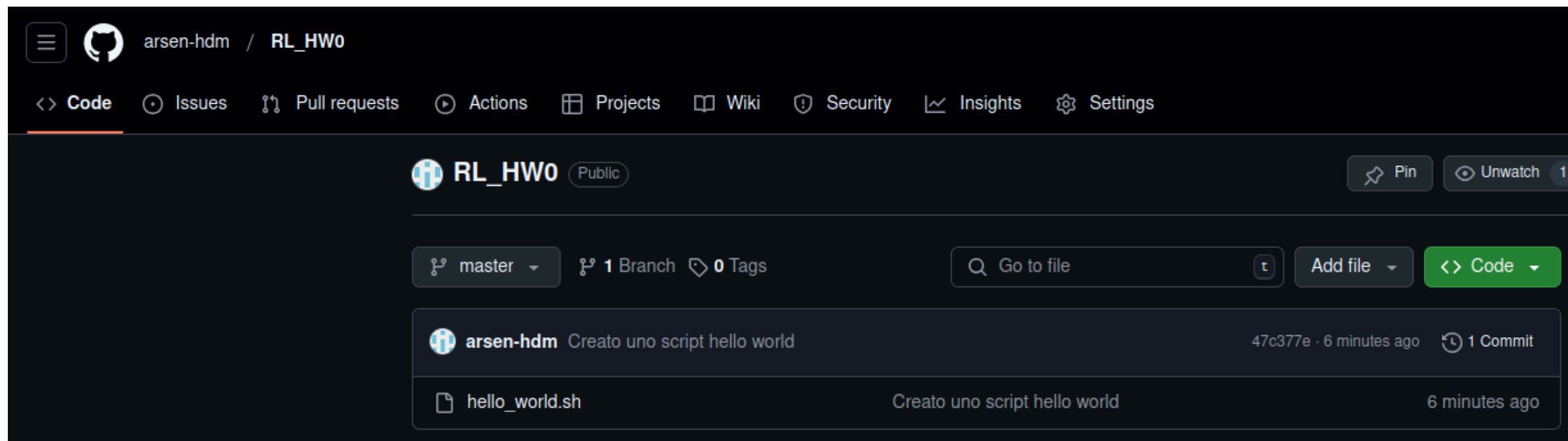
7. Push the local repository to github

Homework 0

And here are the results:


```
arsen@Arsen-PC: ~/loc_rep_hmwk0
                    arsen@Arsen-PC: ~/loc_rep_hmwk0 80x50
arsen@Arsen-PC:~$ mkdir loc_rep_hmwk0
arsen@Arsen-PC:~$ cd loc_rep_hmwk0/
arsen@Arsen-PC:~/loc_rep_hmwk0$ git init
suggerimento: Utilizzo di 'master' come nome per il ramo iniziale. Questo nome r
amo predefinito
suggerimento: è soggetto a modifiche. Per configurare il nome del ramo iniziale
da utilizzare in all
suggerimento: dei tuoi nuovi repository, che sopprimeranno questo avviso, chiama
:
suggerimento:
suggerimento:    git config --global init.defaultBranch <nome>
suggerimento:
suggerimento: I nomi comunemente scelti al posto di 'master' sono 'main', 'trunk
' e
suggerimento: 'sviluppo'. Il ramo appena creato può essere rinominato tramite qu
esto comando:
suggerimento:
suggerimento:    git branch -m <nome>
Inizializzato repository Git vuoto in /home/arsen/loc_rep_hmwk0/.git/
arsen@Arsen-PC:~/loc_rep_hmwk0$ nano hello_world.sh
arsen@Arsen-PC:~/loc_rep_hmwk0$ chmod +x hello_world.sh
arsen@Arsen-PC:~/loc_rep_hmwk0$ ./hello_world.sh
Hello, world!!!
arsen@Arsen-PC:~/loc_rep_hmwk0$ git add hello_world.sh
arsen@Arsen-PC:~/loc_rep_hmwk0$ git add .
```

```
arsen@Arsen-PC:~/loc_rep_hmwk0$ git commit -m "Creato uno script hello world"
[master (commit radice) 47c377e] Creato uno script hello world
 1 file changed, 3 insertions(+)
 create mode 100755 hello_world.sh
arsen@Arsen-PC:~/loc_rep_hmwk0$ git remote add origin https://github.com/arsen-h
dm/RL_HW0.git
arsen@Arsen-PC:~/loc_rep_hmwk0$ git push origin master
Username for 'https://github.com': arsen-hdm
Password for 'https://arsen-hdm@github.com':
Enumerazione degli oggetti in corso: 3, fatto.
Conteggio degli oggetti in corso: 100% (3/3), fatto.
Scrittura degli oggetti in corso: 100% (3/3), 263 byte | 263.00 KiB/s, fatto.
3 oggetti totali (0 delta), 0 riutilizzati (0 delta), 0 riutilizzati nel file pa
ck
To https://github.com/arsen-hdm/RL_HW0.git
 * [new branch]      master -> master
arsen@Arsen-PC:~/loc_rep_hmwk0$
```

Homework 0

Homework 0

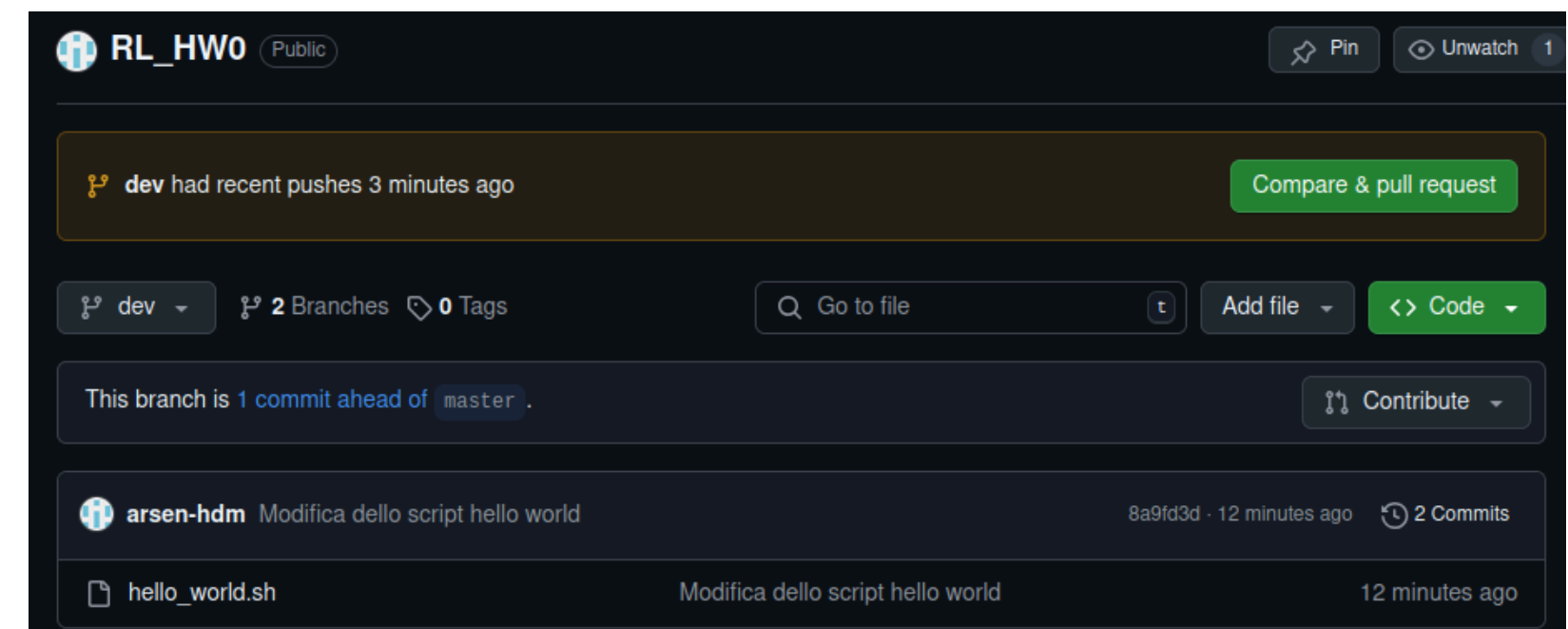**Those are the last tasks of the Git related point:**

Create a new branch

1. Starting from the previous repository create a new branch called `dev`

2. Modify the `hello_world` source file

3. Upload the repository pushing to the new branch
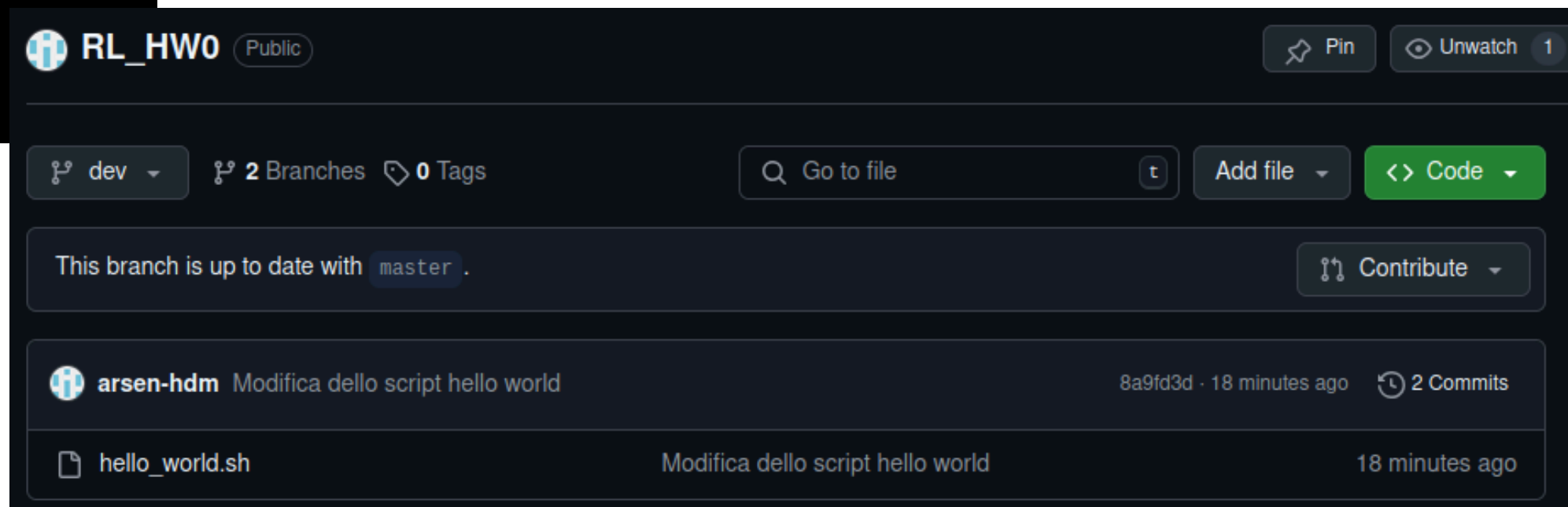
Merge the branches

1. Merge the two branch of the previous exercise in the master one

Homework 0

Homework 0

And now, the last point of the first HW has some tasks to do with Docker, which are these:

Docker creation

1. Create a development folder where to put your source file
2. Create a container starting from a ROS image (use the script)
3. Create a file on the host development folder with some content
4. Check that this file exists in the container

Docker management

1. Create multiple containers with the same image
2. Remove all the containers

Docker connection

1. Create a new container
2. Connect to the same container with multiple terminals

Homework 0


```
arsen@Arsen-PC:~/Scrivania/Docker_3.0$ ./docker_run_container.sh rl24img_4 rl24cont_4 rl24fold_4
non-network local connections being added to access control list
user@Arsen-PC:~/ros2_ws$ ls
build  install  log  src
user@Arsen-PC:~/ros2_ws$ cd src
user@Arsen-PC:~/ros2_ws/src$ ls
aruco_ros              m-explore-ros2              ros2_iiwa           usb_cam
calibrationdata        orocos_kinematics_dynamics  ros2_kdl_package
calibrationdata.tar.gz rl_fra2mo_description       ros2_opencv
user@Arsen-PC:~/ros2_ws/src$ mkdir prova
user@Arsen-PC:~/ros2_ws/src$ cd prova/
user@Arsen-PC:~/ros2_ws/src/prova$ touch prova.txt
user@Arsen-PC:~/ros2_ws/src/prova$
```
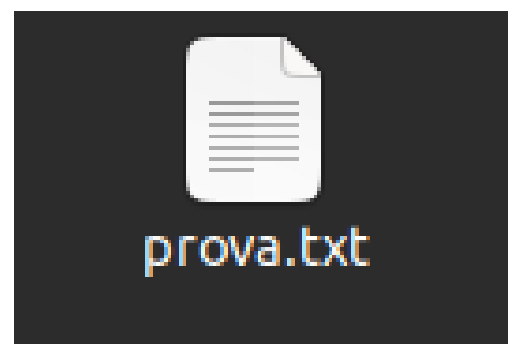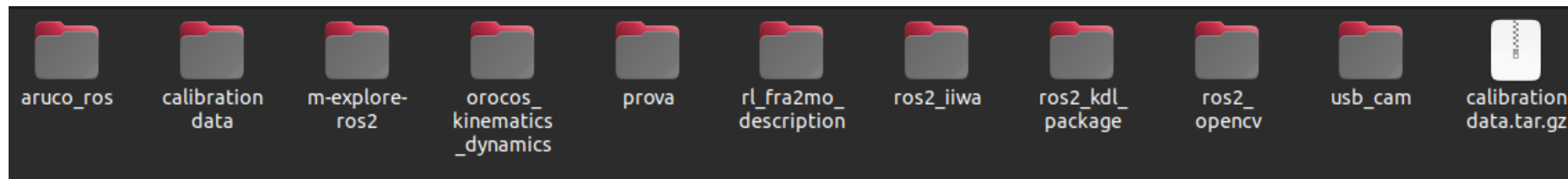
Homework 0

And these are the final results of the HW0:


```
arsen@Arsen-PC:~$ docker ps -a
CONTAINER ID   IMAGE       COMMAND                CREATED          STATUS          PORTS     NAMES
c6f4e5aac96a   rl24img_4   "/ros_entrypoint.sh …"   10 minutes ago   Up 10 minutes             rl24cont_4
arsen@Arsen-PC:~$ docker create -it --name hmwk0_container rl24img_4 /bin/bash
eee8017cd95654209d5cb5794af6adc6ba5a6841b546d6c03f0918532006478d
arsen@Arsen-PC:~$ docker ps
CONTAINER ID   IMAGE       COMMAND                CREATED          STATUS          PORTS     NAMES
c6f4e5aac96a   rl24img_4   "/ros_entrypoint.sh …"   11 minutes ago   Up 11 minutes             rl24cont_4
arsen@Arsen-PC:~$ docker ps -a
CONTAINER ID   IMAGE       COMMAND                CREATED          STATUS          PORTS     NAMES
eee8017cd956   rl24img_4   "/ros_entrypoint.sh …"   13 seconds ago   Created                   hmwk0_container
c6f4e5aac96a   rl24img_4   "/ros_entrypoint.sh …"   11 minutes ago   Up 11 minutes             rl24cont_4
arsen@Arsen-PC:~$ docker rm hmwk0_container
hmwk0_container
arsen@Arsen-PC:~$ docker ps -a
CONTAINER ID   IMAGE       COMMAND                CREATED          STATUS          PORTS     NAMES
c6f4e5aac96a   rl24img_4   "/ros_entrypoint.sh …"   12 minutes ago   Up 12 minutes             rl24cont_4
arsen@Arsen-PC:~$ cd Scrivania/Docker_3.0/
arsen@Arsen-PC:~/Scrivania/Docker_3.0$ ./docker_connect.sh
Select the container to start
1 rl24cont_4
1
Connecting to the container:  rl24cont_4
access control disabled, clients can connect from any host
user@Arsen-PC:~/ros2_ws$
```