Homework
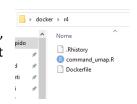
- Create a Dockerfile to build a docker image named r4:v.0.01, starting from rocker/r-ubuntu:20.04
- Install package umap on the docker

First of all, I have to create on the desktop a folder called docker, which contains r4, that in turn contains these 3 files. command_umap.R contains the R command that allows me to install the package umap:

install.packages("umap", repos = 'http://cran.us.r-project.org')

Dockerfile, instead, is created as a txt file and it must contain these commands:

```
#getting base image from rocker
FROM rocker/r-ubuntu:20.04
#execute the updates and upgrades (-y = does not ask to download new softwares)
RUN apt-get update
RUN apt-get upgrade -y
#sudo installation
RUN apt-get install -y sudo
#install nano (base text editor)
RUN sudo apt-get install -y nano
#copy the Rfile with the command to install umap
COPY ./command_umap.R /home/
#execute the R file
RUN chmod +x /home/command_umap.R
```

! When I save it, I have to remember that the file does not contain the extension .txt, because otherwise the next commands will not read it. I have to eliminate the extension .txt.

Once I did this passage, I move to the folder docker on the PowerShell, and I run the command
docker build . -t r4:v.0.01

! The computer requires some time to create the image.

Once the image has been created, I can run it with docker run -i -t r4:v.0.01 then I move to the home (the command is: cd home) → ls (which allows me to see all the files present in my docker) → nano command_umap.R (this command is like Word: it opens the R file that I created in the folder r4 and allows me to read it). I exit from nano with **Ctrlx** and I come back to the PowerShell. Once I verified that the writing of the command_umap.R is correct, I run the command Rscript ./command_umap.R → the computer requires some time to run this command.

Finally, I exit from the docker with the command exit, I move in the folder "docker" and I run the command docker ps -a to see the container that I have to associate to my image. Finally, I associate them with the command docker commit.

```
PS C:\Users\cauci\Desktop> cd docker
PS C:\Users\cauci\Desktop\docker> docker ps -a
CONTAINER ID   IMAGE                    COMMAND                  CREATED          STATUS                     PORTS                      NAMES
361ac97b14dd   r4:v.0.01                "bash"                   16 minutes ago   Exited (0) 17 seconds ago                             sad_boyd
af438c46377b   r4:v.0.01                "bash"                   17 minutes ago   Exited (0) 17 minutes ago                             sharp_moser
26f4033cff30   r4:v.0.01                "bash"                   18 minutes ago   Exited (0) 17 minutes ago                             keen_ride
ab8b1bff4e7e   hello-world              "/hello"                 18 hours ago     Exited (0) 18 hours ago                               trusting_cartwright
801b8ca66766   ubuntu:21.04             "bash"                   47 hours ago     Exited (0) 46 hours ago                               priceless_boyd
4286e159e106   ubuntu:21.04             "bash"                   47 hours ago     Exited (0) 47 hours ago                               elated_shannon
989a21550ff5   ewels/multiqc            "multiqc ."              9 days ago       Exited (0) 9 days ago                                 sweet_hawking
c5e36e4fe995   ewels/multiqc            "multiqc ."              9 days ago       Exited (0) 9 days ago                                 musing_maxwell
73f46aac7235   docker/getting-started   "/docker-entrypoint…"    3 weeks ago      Exited (255) 3 weeks ago   80/tcp, 0.0.0.0:80->80/udp  great_ramanujan
3a198a5c0f14   docker/getting-started   "/docker-entrypoint…"    3 weeks ago      Created                                               stoic_montalcini
fa6c5b86c362   docker/getting-started   "/docker-entrypoint…"    3 weeks ago      Exited (255) 3 weeks ago   0.0.0.0:80->80/tcp          infallible_bohr
PS C:\Users\cauci\Desktop\docker> docker commit 361ac97b14dd r4:v.0.01
sha256:f8fbb99b127328526197bc6d31d0a1bac9f7ad4e3a2d05246fdc8f2a92b1bdbf
PS C:\Users\cauci\Desktop\docker>
```