Visualización de Datos

Práctica 1: Entornos de Desarrollo para Jupyter Notebook

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Parte 1. Desarrollo local con Docker y Jupyter

Actividades

Actividad 1. Ejecutar un servidor de Jupyter Notebook con Docker.

```
# Descargar la imagen de Jupyter desde Docker Hub
docker pull jupyter/base-notebook

# Verificar que la imagen se ha descargado correctamente
docker images
```

```
Using default tag: latest
latest: Pulling from jupyter/base-notebook
Digest: sha256:8c903974902b0e9d45d9823c2234411de0614c5c98c4bb782b3d4f55b3e435e6
Status: Image is up to date for jupyter/base-notebook:latest
docker.io/jupyter/base-notebook:latest
REPOSITORY              TAG       IMAGE ID       CREATED         SIZE
alt-custom-notebook     latest    60419d8e328c   4 hours ago     1.35GB
custom-notebook         latest    cb9cbc36581c   4 hours ago     1.35GB
jupyter/base-notebook   latest    07bb7d6acc26   15 months ago   1.07GB
```

```
# Ejecutar el contenedor
docker run -p 8888:8888 jupyter/base-notebook
```

```
http://127.0.0.1:8888/lab?token=7738cd1b7384d071bf5375d61a74949f8634da3dc8e04a58
```

Actividad 2. Instalar paquetes adicionales.

```
# Verificar el contenedor en ejecución
docker ps

# Instalar numpy dentro del contenedor en ejecución
docker exec 7d434b11306e pip install numpy

# Detener el docker
docker stop 7d434b11306e

# Reiniciar el contenedor y verificar que numpy está instalado
docker run -p 8888:8888 jupyter/base-notebook
```

```
CONTAINER ID   IMAGE                   COMMAND                  CREATED          STATUS
7d434b11306e   jupyter/base-notebook   "tini -g -- start-no…"   14 seconds ago   Up 13 seconds (healthy)


Collecting numpy
  Downloading numpy-2.2.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (62 kB)
                            62.0/62.0 kB 5.6 MB/s eta 0:00:00
Downloading numpy-2.2.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (16.4 MB)
                          16.4/16.4 MB 38.0 MB/s eta 0:00:00
Installing collected packages: numpy
Successfully installed numpy-2.2.2
```

Actividad 3

- Paso 1: Crear un Dockerfile

```
FROM jupyter/base-notebook
RUN pip install numpy pandas matplotlib
```

- Paso 2: Construir la imagen personalizada

```
docker build -t custom-notebook .
```

- Paso 3: Ejecutar el contenedor con la nueva imagen

```
docker run -p 8888:8888 custom-notebook
```

- Paso 4: Crear una imagen a partir de un contenedor en ejecución

```
docker ps
docker commit 3567320794e5 alt-custom-notebook
```

```
CONTAINER ID   IMAGE             COMMAND                  CREATED          STATUS                      PORTS
3567320794e5   custom-notebook   "tini -g -- start-no…"   19 seconds ago   Up 19 seconds (healthy)   0.0.0
```

Actividad 4. Acceder desde el Host

```
pwd
```

```
/workspaces/cid-upct/Prácticas/3º Curso/2º Cuatrimestre/VD/Practica_1
```

```
docker run -p 8888:8888 -v </tu_ruta_en_host>:/home/jovyan/work custom-notebook
```

Parte 2: Gestión de paquetes y entornos virtuales en Python

Actividad 1. Crear un Entorno virtual con **venv** y **conda**.

```
python -m venv mi_entorno
source mi_entorno/bin/activate
```

```
conda create --name mi_entorno
conda activate mi_entorno
```

Actividad 2. Gestión de paquetes con **pip** y **conda**

```
pip install numpy pandas matplotlib
pip list
```

```
Requirement already satisfied: numpy in /home/codespace/.local/lib/python3.12/site-packages (2.2.0)
Requirement already satisfied: pandas in /home/codespace/.local/lib/python3.12/site-packages (2.2.3)
Requirement already satisfied: matplotlib in /home/codespace/.local/lib/python3.12/site-packages (3.9.3)
Requirement already satisfied: python-dateutil>=2.8.2 in /home/codespace/.local/lib/python3.12/site-packag
Requirement already satisfied: pytz>=2020.1 in /home/codespace/.local/lib/python3.12/site-packages (from p
Requirement already satisfied: tzdata>=2022.7 in /home/codespace/.local/lib/python3.12/site-packages (from
Requirement already satisfied: contourpy>=1.0.1 in /home/codespace/.local/lib/python3.12/site-packages (fr
Requirement already satisfied: cycler>=0.10 in /home/codespace/.local/lib/python3.12/site-packages (from m
Requirement already satisfied: fonttools>=4.22.0 in /home/codespace/.local/lib/python3.12/site-packages (f
Requirement already satisfied: kiwisolver>=1.3.1 in /home/codespace/.local/lib/python3.12/site-packages (f
Requirement already satisfied: packaging>=20.0 in /home/codespace/.local/lib/python3.12/site-packages (fro
Requirement already satisfied: pillow>=8 in /home/codespace/.local/lib/python3.12/site-packages (from matp
Requirement already satisfied: pyparsing>=2.3.1 in /home/codespace/.local/lib/python3.12/site-packages (fr
Requirement already satisfied: six>=1.5 in /home/codespace/.local/lib/python3.12/site-packages (from pytho

[notice] A new release of pip is available: 24.3.1 -> 25.0
[notice] To update, run: pip install --upgrade pip
Package                  Version
------------------------ --------------
anyio                    4.7.0
archspec                 0.2.3
argon2-cffi              23.1.0
```

argon2-cffi-bindings	21.2.0
arrow	1.3.0
asttokens	3.0.0
async-lru	2.0.4
attrs	24.2.0
babel	2.16.0
beautifulsoup4	4.12.3
bleach	6.2.0
boltons	23.0.0
Brotli	1.0.9
certifi	2024.8.30
cffi	1.17.1
charset-normalizer	3.4.0
colorama	0.4.6
comm	0.2.2
conda	24.11.1
conda-libmamba-solver	24.1.0
conda-package-handling	2.2.0
conda_package_streaming	0.9.0
contourpy	1.3.1
cryptography	41.0.4
cycler	0.12.1
debugpy	1.8.9
decorator	5.1.1
defusedxml	0.7.1
distro	1.9.0
executing	2.1.0
fastjsonschema	2.21.1
filelock	3.13.1
fonttools	4.55.3
fqdn	1.5.1
frozendict	2.4.2
fsspec	2024.2.0
gitdb	4.0.11
GitPython	3.1.43
h11	0.14.0
httpcore	1.0.7
httpx	0.28.1
idna	3.10
ipykernel	6.29.5
ipython	8.30.0
ipywidgets	8.1.5
isoduration	20.11.0
jedi	0.19.2
Jinja2	3.1.4
joblib	1.4.2
json5	0.10.0
jsonpatch	1.33
jsonpointer	3.0.0
jsonschema	4.23.0
jsonschema-specifications	2024.10.1
jupyter	1.1.1
jupyter_client	8.6.3
jupyter-console	6.6.3
jupyter_core	5.7.2
jupyter-events	0.10.0
jupyter-lsp	2.2.5
jupyter_server	2.14.2
jupyter-server-mathjax	0.2.6
jupyter_server_terminals	0.5.3
jupyterlab	4.3.5
jupyterlab_git	0.50.2
jupyterlab_pygments	0.3.0

jupyterlab_server	2.27.3
jupyterlab_widgets	3.0.13
kiwisolver	1.4.7
libmambapy	1.5.8
MarkupSafe	3.0.2
matplotlib	3.9.3
matplotlib-inline	0.1.7
menuinst	2.0.2
mistune	3.0.2
mpmath	1.3.0
nbclient	0.10.1
nbconvert	7.16.4
nbdime	4.0.2
nbformat	5.10.4
nest-asyncio	1.6.0
networkx	3.2.1
notebook	7.3.2
notebook_shim	0.2.4
numpy	2.2.0
overrides	7.7.0
packaging	24.2
pandas	2.2.3
pandocfilters	1.5.1
parso	0.8.4
pexpect	4.9.0
pillow	11.0.0
pip	24.3.1
platformdirs	4.3.6
plotly	5.24.1
pluggy	1.0.0
prometheus_client	0.21.1
prompt_toolkit	3.0.48
psutil	6.1.0
ptyprocess	0.7.0
pure_eval	0.2.3
pycosat	0.6.6
pycparser	2.22
Pygments	2.18.0
pyOpenSSL	24.2.1
pyparsing	3.2.0
PySocks	1.7.1
python-dateutil	2.9.0.post0
python-json-logger	3.2.0
pytz	2024.2
PyYAML	6.0.2
pyzmq	26.2.0
referencing	0.35.1
requests	2.32.3
rfc3339-validator	0.1.4
rfc3986-validator	0.1.1
rpds-py	0.22.3
ruamel.yaml	0.17.21
scikit-learn	1.6.0
scipy	1.14.1
seaborn	0.13.2
Send2Trash	1.8.3
setuptools	75.6.0
six	1.17.0
smmap	5.0.1
sniffio	1.3.1
soupsieve	2.6
stack-data	0.6.3
sympy	1.13.1

```
tenacity                  9.0.0
terminado                 0.18.1
threadpoolctl             3.5.0
tinycss2                  1.4.0
torch                     2.5.1+cpu
tornado                   6.4.2
tqdm                      4.66.2
traitlets                 5.14.3
truststore                0.8.0
types-python-dateutil     2.9.0.20241206
typing_extensions         4.12.2
tzdata                    2024.2
uri-template              1.3.0
urllib3                   2.2.3
wcwidth                   0.2.13
webcolors                 24.11.1
webencodings              0.5.1
websocket-client          1.8.0
wheel                     0.43.0
widgetsnbextension        4.0.13
zstandard                 0.22.0
```

```
conda install numpy pandas matplotlib
conda list
```

```
pip install jupyter
python -m ipykernel install --user --name=mi_entorno --display-name "Python (mi entorno)"
jupyter notebook
```

Actividad 3. Cambiar entre Entornos Virtuales

```
# Exportar paquetes instalados
pip freese > requieremens.txt

# Desactivar el entorno actual
deactivate
```

```
ERROR: unknown command "freese" - maybe you meant "freeze"
DeprecationWarning: 'source deactivate' is deprecated. Use 'conda deactivate'.
```

```
# Crear un nuevo entorno y restaurar los paquetes
python -m venv otro_entorno
source otro_entorno/bin/activate
pip install -r requieremens.txt
```

Parte 3. Control de versiones con Git y GitHub

Actividad 1. Configuración de Git en el Entorno Local

```
git config --global user.name "Francisco Javier Mercader Martínez"
git config --global user.email "franciscojavier.mercader@edu.upct.es"
```

```
# Comprobamos que tenemos la clave de SSH
ls -l ~/.ssh/

# Agregar la clave SSH a GitHub
cat ~/.ssh/id_rsa.pub | xclip -selection clipboard
```

Actividad 2. Creación y Clonación de un Repositorio en GitHub

```
git clone https://github.com/franjavi-upct-es/cid-upct
cd cid-upct
```

Actividad 3. Agregar y Versionar un Jupyter Notebook

```
git add .
git commit -m "Añadir mi notebook"
git push origin main
```

```
error: gpg failed to sign the data:
[GNUPG:] BEGIN_SIGNING
2025/02/04 16:17:30 error signing commit: error signing commit: error making request: 403 | Author is inva

fatal: failed to write commit object
Everything up-to-date
```

Actividad 4. Gestión de Cambios y Resolución de Conflictos

```
git pull origin main
```

```
From https://github.com/franjavi-upct-es/cid-upct
 * branch            main       -> FETCH_HEAD
Already up to date.
```

Actividad 5. Uso de Ramas y Colaboración con Pull Requests

```
git checkout -b master
git commit -m "Cambios en la rama `master`"
git push origin master
```