Objective: Build a starter project environment automatically.

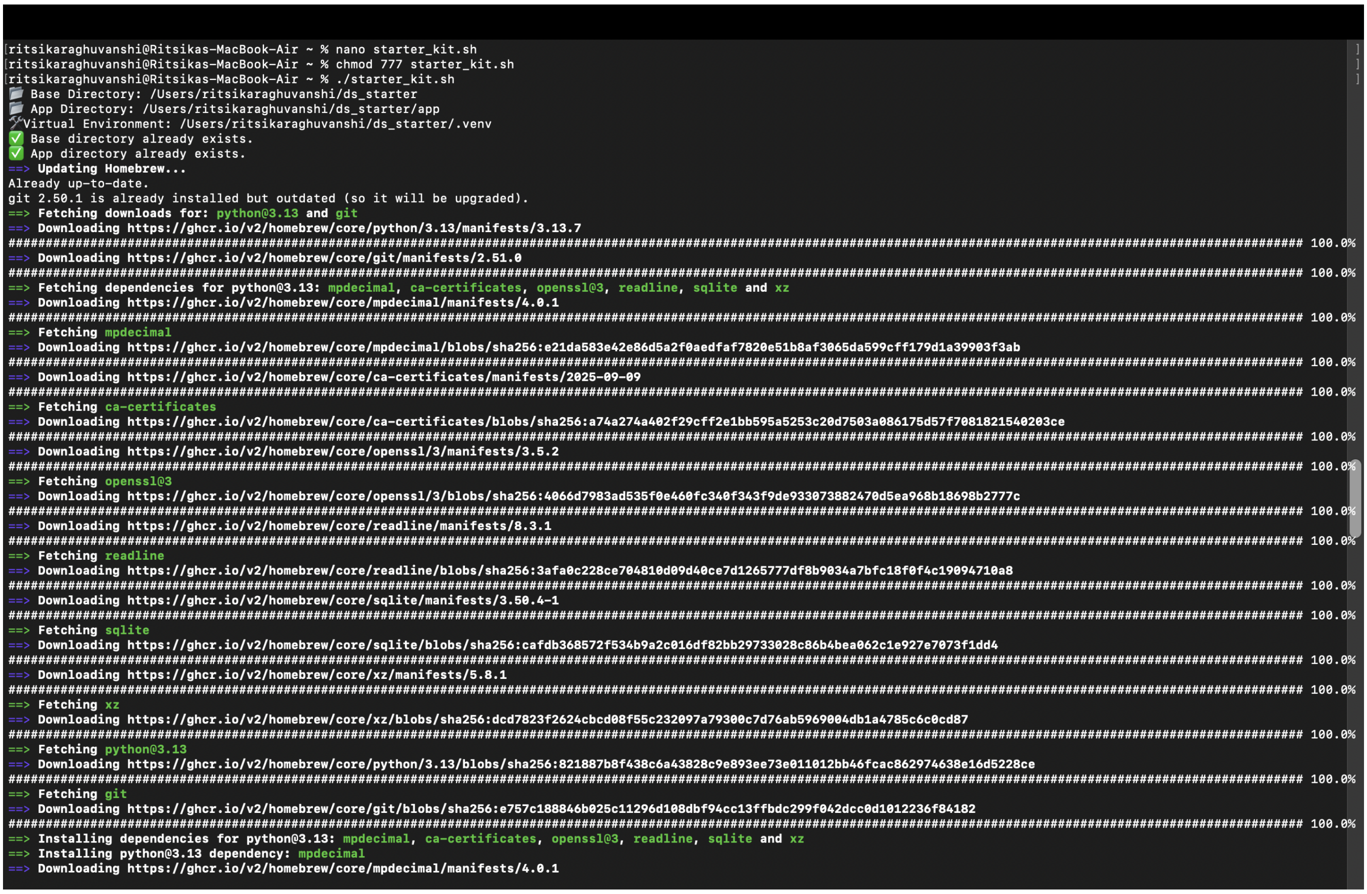
starter_kit.sh

```
#!/bin/bash

# Create project directories
mkdir -p project/scripts project/docs project/data

# Add placeholder README.md in each folder
for folder in project project/scripts project/docs project/data; do
    echo "# README for $(basename "$folder")" > "$folder/README.md"
done
```

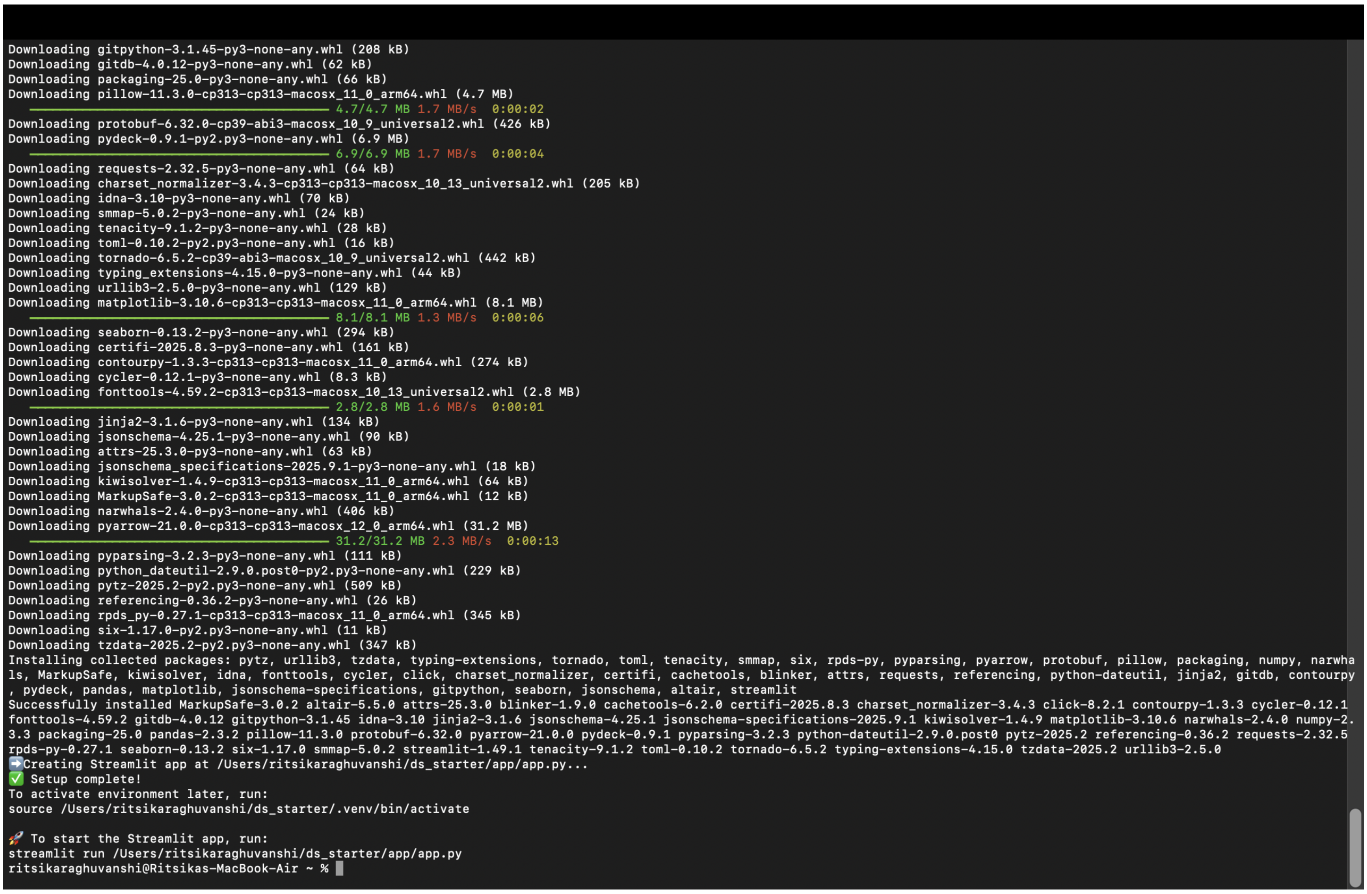
Print completion message

echo "Starter Kit Ready!" How it works: *mkdir -p* ensures parent directories are created if they don’t exist. The for loop adds a README.md in each folder with a placeholder title. Finally, it prints Starter Kit Ready!. LAB_extra.md

Sample Output



```
ritsikaraghuvanshi@Ritsikas-MacBook-Air ~ % nano starter_kit.sh
ritsikaraghuvanshi@Ritsikas-MacBook-Air ~ % chmod 777 starter_kit.sh
ritsikaraghuvanshi@Ritsikas-MacBook-Air ~ % ./starter_kit.sh
📁 Base Directory: /Users/ritsikaraghuvanshi/ds_starter
📁 App Directory: /Users/ritsikaraghuvanshi/ds_starter/app
🛠Virtual Environment: /Users/ritsikaraghuvanshi/ds_starter/.venv
✅ Base directory already exists.
✅ App directory already exists.
==> Updating Homebrew...
Already up-to-date.
git 2.50.1 is already installed but outdated (so it will be upgraded).
==> Fetching downloads for: python@3.13 and git
==> Downloading https://ghcr.io/v2/homebrew/core/python/3.13/manifests/3.13.7
############################################################################################################################################################################## 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/git/manifests/2.51.0
############################################################################################################################################################################## 100.0%
==> Fetching dependencies for python@3.13: mpdecimal, ca-certificates, openssl@3, readline, sqlite and xz
==> Downloading https://ghcr.io/v2/homebrew/core/mpdecimal/manifests/4.0.1
############################################################################################################################################################################## 100.0%
==> Fetching mpdecimal
==> Downloading https://ghcr.io/v2/homebrew/core/mpdecimal/blobs/sha256:e21da583e42e86d5a2f0aedfaf7820e51b8af3065da599cff179d1a39903f3ab
############################################################################################################################################################################## 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/ca-certificates/manifests/2025-09-09
############################################################################################################################################################################## 100.0%
==> Fetching ca-certificates
==> Downloading https://ghcr.io/v2/homebrew/core/ca-certificates/blobs/sha256:a74a274a402f29cff2e1bb595a5253c20d7503a086175d57f7081821540203ce
############################################################################################################################################################################## 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/openssl/3/manifests/3.5.2
############################################################################################################################################################################## 100.0%
==> Fetching openssl@3
==> Downloading https://ghcr.io/v2/homebrew/core/openssl/3/blobs/sha256:4066d7983ad535f0e460fc340f343f9de933073882470d5ea968b18698b2777c
############################################################################################################################################################################## 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/readline/manifests/8.3.1
############################################################################################################################################################################## 100.0%
==> Fetching readline
==> Downloading https://ghcr.io/v2/homebrew/core/readline/blobs/sha256:3afa0c228ce704810d09d40ce7d1265777df8b9034a7bfc18f0f4c19094710a8
############################################################################################################################################################################## 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/sqlite/manifests/3.50.4-1
############################################################################################################################################################################## 100.0%
==> Fetching sqlite
==> Downloading https://ghcr.io/v2/homebrew/core/sqlite/blobs/sha256:cafdb368572f534b9a2c016df82bb29733028c86b4bea062c1e927e7073f1dd4
############################################################################################################################################################################## 100.0%
==> Downloading https://ghcr.io/v2/homebrew/core/xz/manifests/5.8.1
############################################################################################################################################################################## 100.0%
==> Fetching xz
==> Downloading https://ghcr.io/v2/homebrew/core/xz/blobs/sha256:dcd7823f2624cbcd08f55c232097a79300c7d76ab5969004db1a4785c6c0cd87
############################################################################################################################################################################## 100.0%
==> Fetching python@3.13
==> Downloading https://ghcr.io/v2/homebrew/core/python/3.13/blobs/sha256:821887b8f438c6a43828c9e893ee73e011012bb46fcac862974638e16d5228ce
############################################################################################################################################################################## 100.0%
==> Fetching git
==> Downloading https://ghcr.io/v2/homebrew/core/git/blobs/sha256:e757c188846b025c11296d108dbf94cc13ffbdc299f042dcc0d1012236f84182
############################################################################################################################################################################## 100.0%
==> Installing dependencies for python@3.13: mpdecimal, ca-certificates, openssl@3, readline, sqlite and xz
==> Installing python@3.13 dependency: mpdecimal
==> Downloading https://ghcr.io/v2/homebrew/core/mpdecimal/manifests/4.0.1
```



```
Downloading gitpython-3.1.45-py3-none-any.whl (208 kB)
Downloading gitdb-4.0.12-py3-none-any.whl (62 kB)
Downloading packaging-25.0-py3-none-any.whl (66 kB)
Downloading pillow-11.3.0-cp313-cp313-macosx_11_0_arm64.whl (4.7 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 4.7/4.7 MB 1.7 MB/s  0:00:02
Downloading protobuf-6.32.0-cp39-abi3-macosx_10_9_universal2.whl (426 kB)
Downloading pydeck-0.9.1-py2.py3-none-any.whl (6.9 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 6.9/6.9 MB 1.7 MB/s  0:00:04
Downloading requests-2.32.5-py3-none-any.whl (64 kB)
Downloading charset_normalizer-3.4.3-cp313-cp313-macosx_10_13_universal2.whl (205 kB)
Downloading idna-3.10-py3-none-any.whl (70 kB)
Downloading smmap-5.0.2-py3-none-any.whl (24 kB)
Downloading tenacity-9.1.2-py3-none-any.whl (28 kB)
Downloading toml-0.10.2-py2.py3-none-any.whl (16 kB)
Downloading tornado-6.5.2-cp39-abi3-macosx_10_9_universal2.whl (442 kB)
Downloading typing_extensions-4.15.0-py3-none-any.whl (44 kB)
Downloading urllib3-2.5.0-py3-none-any.whl (129 kB)
Downloading matplotlib-3.10.6-cp313-cp313-macosx_11_0_arm64.whl (8.1 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 8.1/8.1 MB 1.3 MB/s  0:00:06
Downloading seaborn-0.13.2-py3-none-any.whl (294 kB)
Downloading certifi-2025.8.3-py3-none-any.whl (161 kB)
Downloading contourpy-1.3.3-cp313-cp313-macosx_11_0_arm64.whl (274 kB)
Downloading cycler-0.12.1-py3-none-any.whl (8.3 kB)
Downloading fonttools-4.59.2-cp313-cp313-macosx_10_13_universal2.whl (2.8 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 2.8/2.8 MB 1.6 MB/s  0:00:01
Downloading jinja2-3.1.6-py3-none-any.whl (134 kB)
Downloading jsonschema-4.25.1-py3-none-any.whl (90 kB)
Downloading attrs-25.3.0-py3-none-any.whl (63 kB)
Downloading jsonschema_specifications-2025.9.1-py3-none-any.whl (18 kB)
Downloading kiwisolver-1.4.9-cp313-cp313-macosx_11_0_arm64.whl (64 kB)
Downloading MarkupSafe-3.0.2-cp313-cp313-macosx_11_0_arm64.whl (12 kB)
Downloading narwhals-2.4.0-py3-none-any.whl (406 kB)
Downloading pyarrow-21.0.0-cp313-cp313-macosx_12_0_arm64.whl (31.2 MB)
   ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 31.2/31.2 MB 2.3 MB/s  0:00:13
Downloading pyparsing-3.2.3-py3-none-any.whl (111 kB)
Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl (229 kB)
Downloading pytz-2025.2-py2.py3-none-any.whl (509 kB)
Downloading referencing-0.36.2-py3-none-any.whl (26 kB)
Downloading rpds_py-0.27.1-cp313-cp313-macosx_11_0_arm64.whl (345 kB)
Downloading six-1.17.0-py2.py3-none-any.whl (11 kB)
Downloading tzdata-2025.2-py2.py3-none-any.whl (347 kB)
Installing collected packages: pytz, urllib3, tzdata, typing-extensions, tornado, toml, tenacity, smmap, six, rpds-py, pyparsing, pyarrow, protobuf, pillow, packaging, numpy, narwha
ls, MarkupSafe, kiwisolver, idna, fonttools, cycler, click, charset_normalizer, certifi, cachetools, blinker, attrs, requests, referencing, python-dateutil, jinja2, gitdb, contourpy
, pydeck, pandas, matplotlib, jsonschema-specifications, gitpython, seaborn, jsonschema, altair, streamlit
Successfully installed MarkupSafe-3.0.2 altair-5.5.0 attrs-25.3.0 blinker-1.9.0 cachetools-6.2.0 certifi-2025.8.3 charset_normalizer-3.4.3 click-8.2.1 contourpy-1.3.3 cycler-0.12.1
fonttools-4.59.2 gitdb-4.0.12 gitpython-3.1.45 idna-3.10 jinja2-3.1.6 jsonschema-4.25.1 jsonschema-specifications-2025.9.1 kiwisolver-1.4.9 matplotlib-3.10.6 narwhals-2.4.0 numpy-2.
3.3 packaging-25.0 pandas-2.3.2 pillow-11.3.0 protobuf-6.32.0 pyarrow-21.0.0 pydeck-0.9.1 pyparsing-3.2.3 python-dateutil-2.9.0.post0 pytz-2025.2 referencing-0.36.2 requests-2.32.5
rpds-py-0.27.1 seaborn-0.13.2 six-1.17.0 smmap-5.0.2 streamlit-1.49.1 tenacity-9.1.2 toml-0.10.2 tornado-6.5.2 typing-extensions-4.15.0 tzdata-2025.2 urllib3-2.5.0
➡️Creating Streamlit app at /Users/ritsikaraghuvanshi/ds_starter/app/app.py...
✅ Setup complete!
To activate environment later, run:
source /Users/ritsikaraghuvanshi/ds_starter/.venv/bin/activate

🚀 To start the Streamlit app, run:
streamlit run /Users/ritsikaraghuvanshi/ds_starter/app/app.py
ritsikaraghuvanshi@Ritsikas-MacBook-Air ~ % 
```

LAB_extra

Purpose of Script

The `starter_kit.sh` script automates the creation of a starter project structure. It:

- Creates a `project/` folder with subfolders: `scripts/`, `docs/`, `data/`.
- Adds a placeholder `README.md` file in each folder.
- Prints a confirmation message after successful execution.

This saves time and ensures consistent project folder setup.

Example Run

$ bash starter_kit.sh Starter Kit Ready! **Folder structure after running:** project/

- ├── README.md
- ├── scripts/
- │ └── README.md
- ├── docs/
- │ └── README.md
- └── data/
- └── README.md

Extra Questions

1. What does mkdir -p do? ·*mkdir* is the command to make a new directory (folder). ·The *-p* flag stands for “parents”, and it has two main effects: ·Creates parent directories if they don’t exist. ·Without -p, *mkdir* project scripts would give an error if project doesn’t already exist. ·Doesn’t complain if the directory already exists. Normally, mkdir foldername fails if the folder already exists. With -p, it just moves on quietly.

2. Why is automation useful in DevOps? -DevOps focuses on collaboration, speed, and reliability in software development and deployment. Automation is a core part because it:

- Saves Time
- Repetitive tasks like creating environments, deploying code, or running tests can be automated.
- Reduces manual work so teams can focus on actual development.
- Reduces Human Error
- Manual tasks are prone to mistakes (typos, missing steps).
- Scripts and automation tools ensure tasks are executed consistently every time.
- Speeds Up Delivery
- Automation allows continuous integration and continuous deployment (CI/CD).
- Software updates can reach users faster and more reliably.
- Ensures Consistency Across Environments
- Development, testing, and production environments can be automatically configured the same way.
- Avoids the “it works on my machine” problem.
- Scales Easily
- Tasks that are simple for one system can be automatically applied to hundreds or thousands of servers.