

Assignment 3

Team 29

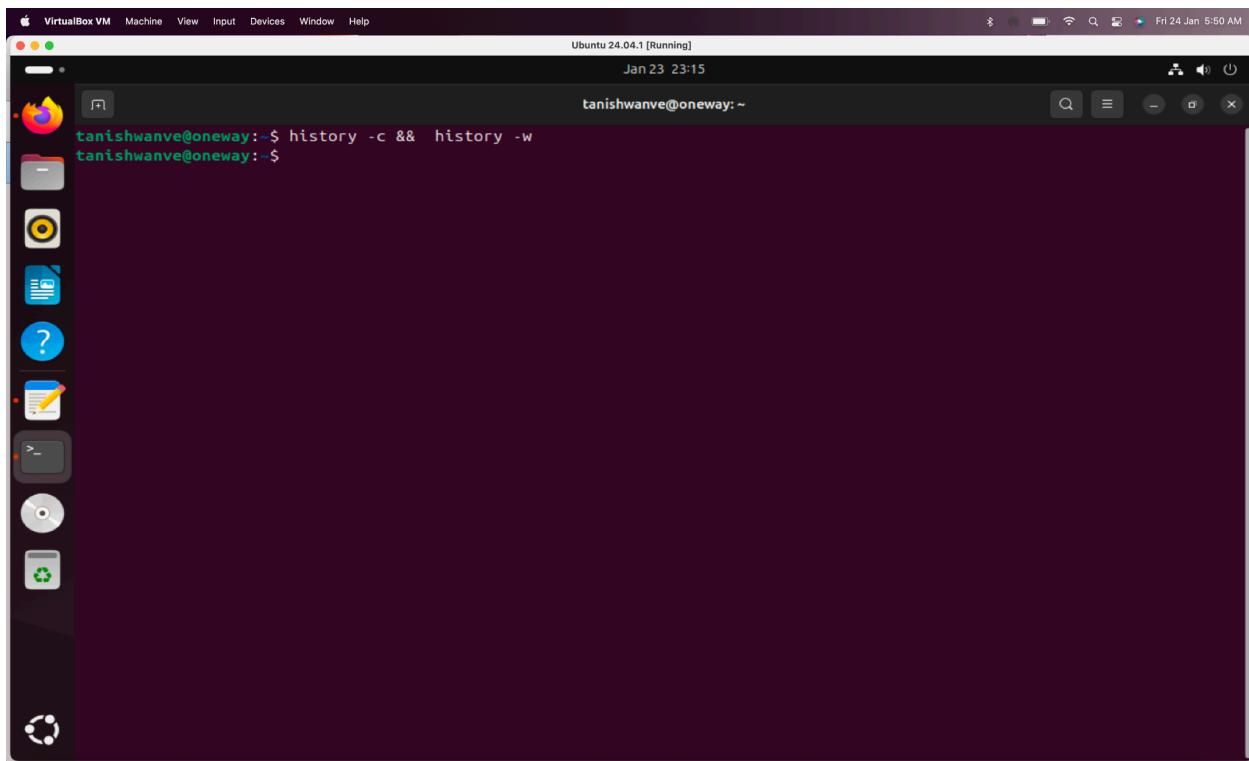
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Github Repository Link - <https://github.com/TanishWanve/STTAssignment2.git>

Google Colab Link -

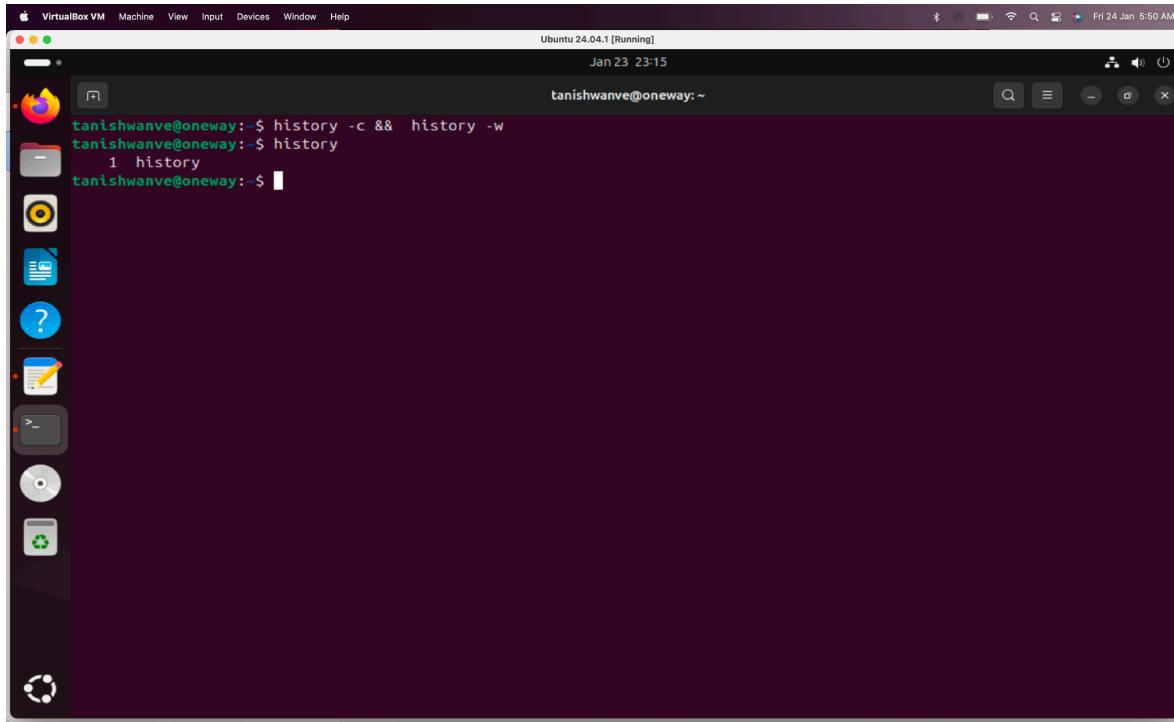
<https://colab.research.google.com/drive/1eNgXczOQRxbIf0zeMm3cdzpzbWzepbYF?usp=sharing>

Task 1: Setting Up Python 3.10 on Ubuntu



```
Ubuntu 24.04.1 [Running]
Jan 23 23:15
tanishwanve@oneway:~$ history -c && history -w
tanishwanve@oneway:~$
```

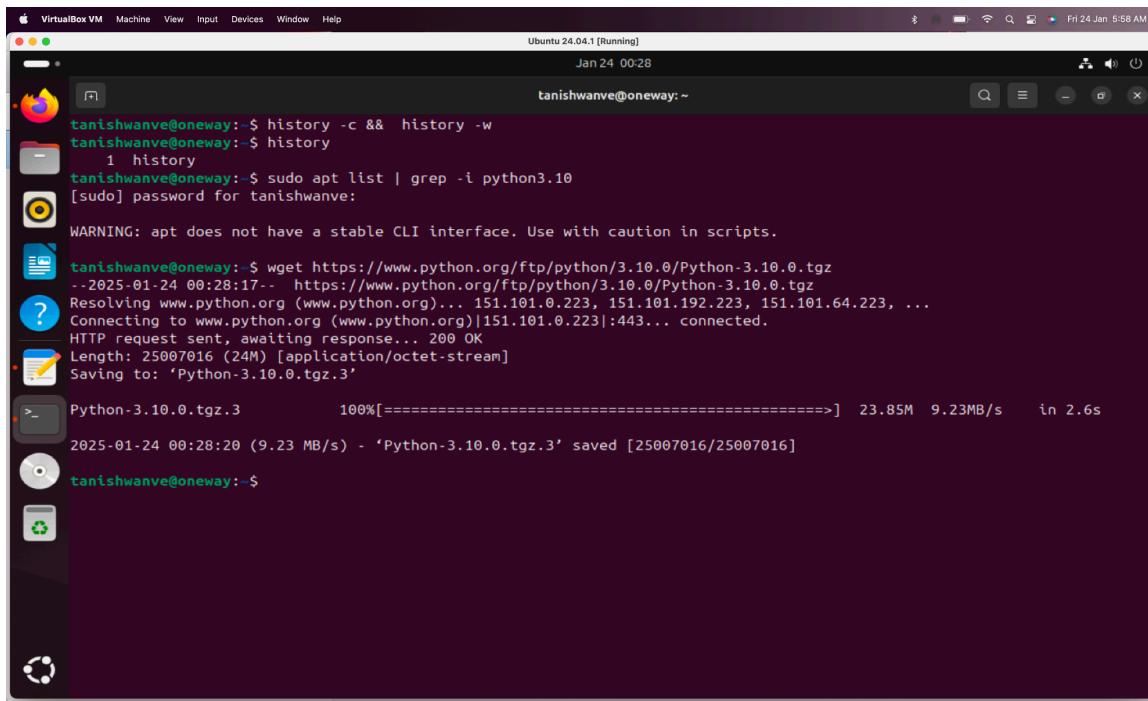
1. Cleared all the command history to ensure a clean start for the session.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Ubuntu 24.04.1 [Running]" and the date and time are "Jan 23 23:15". The terminal shows the following command history:

```
tanishwanve@oneway:~$ history -c && history -w
tanishwanve@oneway:~$ history
1 history
tanishwanve@oneway:~$
```

2. Verified that the command history was cleared successfully, as indicated by the minimal output showing only the history command itself.



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Ubuntu 24.04.1 [Running]" and the date and time are "Jan 24 00:28". The terminal shows the following commands and output:

```
tanishwanve@oneway:~$ history -c && history -w
tanishwanve@oneway:~$ history
1 history
tanishwanve@oneway:~$ sudo apt list | grep -i python3.10
[sudo] password for tanishwanve:
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

tanishwanve@oneway:~$ wget https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
--2025-01-24 00:28:17-- https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
Resolving www.python.org (www.python.org)... 151.101.0.223, 151.101.192.223, 151.101.64.223, ...
Connecting to www.python.org (www.python.org)|151.101.0.223|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 25007016 (24M) [application/octet-stream]
Saving to: 'Python-3.10.0.tgz.3'

Python-3.10.0.tgz.3          100%[=====] 23.85M  9.23MB/s  in 2.6s

2025-01-24 00:28:20 (9.23 MB/s) - 'Python-3.10.0.tgz.3' saved [25007016/25007016]
tanishwanve@oneway:~$
```

3. Checked if Python 3.10 was already installed on the system. The command returned no results, indicating Python 3.10 was not installed. Thus, downloaded the Python 3.10 source code from the official Python website using the wget command.

```
Ubuntu 24.04.1 [Running]
Jan 24 00:29
tanishwanve@oneway:~$ history -c && history -w
tanishwanve@oneway:~$ history
1 history
tanishwanve@oneway:~$ sudo apt list | grep -i python3.10
[sudo] password for tanishwanve:
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

tanishwanve@oneway:~$ wget https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
--2025-01-24 00:28:17-- https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
Resolving www.python.org (www.python.org)... 151.101.0.223, 151.101.192.223, 151.101.64.223, ...
Connecting to www.python.org (www.python.org)|151.101.0.223|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 25007016 (24M) [application/octet-stream]
Saving to: 'Python-3.10.0.tgz.3'

Python-3.10.0.tgz.3          100%[=====] 23.85M 9.23MB/s   in 2.6s
2025-01-24 00:28:20 (9.23 MB/s) - 'Python-3.10.0.tgz.3' saved [25007016/25007016]

tanishwanve@oneway:~$ tar -xzf Python-3.10.0.tgz
tanishwanve@oneway:~$
```

4.Extracted the downloaded tarball and navigated into the extracted Python 3.10 directory to prepare for the installation process.

```
Ubuntu 24.04.1 [Running]
Jan 24 00:29
tanishwanve@oneway:~/Python-3.10.0$ history -c && history -w
tanishwanve@oneway:~/Python-3.10.0$ history
1 history
tanishwanve@oneway:~/Python-3.10.0$ sudo apt list | grep -i python3.10
[sudo] password for tanishwanve:
WARNING: apt does not have a stable CLI interface. Use with caution in scripts.

tanishwanve@oneway:~/Python-3.10.0$ wget https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
--2025-01-24 00:28:17-- https://www.python.org/ftp/python/3.10.0/Python-3.10.0.tgz
Resolving www.python.org (www.python.org)... 151.101.0.223, 151.101.192.223, 151.101.64.223, ...
Connecting to www.python.org (www.python.org)|151.101.0.223|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 25007016 (24M) [application/octet-stream]
Saving to: 'Python-3.10.0.tgz.3'

Python-3.10.0.tgz.3          100%[=====] 23.85M 9.23MB/s   in 2.6s
2025-01-24 00:28:20 (9.23 MB/s) - 'Python-3.10.0.tgz.3' saved [25007016/25007016]

tanishwanve@oneway:~/Python-3.10.0$ tar -xzf Python-3.10.0.tgz
tanishwanve@oneway:~/Python-3.10.0$ cd Python-3.10.0
tanishwanve@oneway:~/Python-3.10.0$
```

5.Changes the current working directory to the Python 3.10 source directory.

```
tanishwanve@oneway:~/Python-3.10.0$ tar -xzf Python-3.10.0.tgz
tanishwanve@oneway:~/Python-3.10.0$ cd Python-3.10.0
tanishwanve@oneway:~/Python-3.10.0$ ./configure --prefix=$HOME/python3.10
checking build system type... aarch64-unknown-linux-gnu
checking host system type... aarch64-unknown-linux-gnu
checking for python3.10... python3.10
checking for --enable-universalsdk... no
checking for --with-universal-archs... no
checking MACHDEP... "linux"
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether we are using the GNU C compiler... yes
checking whether gcc accepts -g... yes
checking for gcc option to accept ISO C89... none needed
checking how to run the C preprocessor... gcc -E
checking for grep that handles long lines and -e... /usr/bin/grep
checking for a sed that does not truncate output... /usr/bin/sed
checking for --with-cxx-main=<compiler>... no
checking for g++... no
configure:

By default, distutils will build C++ extension modules with "g++".
If this is not intended, then set CXX on the configure command line.

checking for the platform triplet based on compiler characteristics... aarch64-linux-gnu
checking for -WL,--no-as-needed... yes
checking for egrep... /usr/bin/grep -E
checking for ANSI C header files... yes
checking for sys/types.h... yes
```

6. Configures the Python build to use a custom installation path in the home directory.

```
tanishwanve@oneway:~/Python-3.10.0$ ./configure --prefix=$HOME/python3.10
checking for shm_unlink... yes
checking for pkg-config... no
checking for openssl/ssl.h in /usr/local/ssl... no
checking for openssl/ssl.h in /usr/lib/ssl... no
checking for openssl/ssl.h in /usr/ssl... no
checking for openssl/ssl.h in /usr/pkg... no
checking for openssl/ssl.h in /usr/local... no
checking for openssl/ssl.h in /usr... yes
checking whether compiling and linking against OpenSSL works... yes
checking for --with-openssl-rpath...
checking for --with-ssl-default-suites... python
checking for --with-built-in-hashlib-hashes... md5,sha1,sha256,sha512,sha3,blake2
checking for --with-experimental-isolated-subinterpreters... no
checking for --with-static-libpython... yes
checking for --disable-test-modules... no
configure: creating ./config.status
config.status: creating Makefile.pre
config.status: creating Misc/python.pc
config.status: creating Misc/python-embed.pc
config.status: creating Misc/python-config.sh
config.status: creating Modules/ld_so_aix
config.status: creating pyconfig.h
config.status: pyconfig.h is unchanged
creating Modules/Setup.local
creating Makefile

If you want a release build with all stable optimizations active (PGO, etc),
please run ./configure --enable-optimizations
```

7. The configuration step checks system compatibility, compilers, libraries (like OpenSSL for secure communication), and creates necessary files (e.g., Makefile) for building Python.

```

tanishwanve@oneway:~/Python-3.10.0$ make
gcc -c -Wno-unused-result -Wsign-compare -DNDEBUG -g -fwrapv -O3 -Wall      -std=c99 -Wextra -Wno-unused-result -Wno-unused-parameter -Wno-missing-field-initializers -Werror=implicit-function-declaration -fvisibility=hidden -I./Include/internal -I./Include -DPy_BUILD_CORE \
    -DABIFLAGS='' \
    -DMULTIARCH='aarch64-linux-gnu' \
    -o Python/sysmodule.o ./Python/sysmodule.c
gcc -c -Wno-unused-result -Wsign-compare -DNDEBUG -g -fwrapv -O3 -Wall      -std=c99 -Wextra -Wno-unused-result -Wno-unused-parameter -Wno-missing-field-initializers -Werror=implicit-function-declaration -fvisibility=hidden -I./Include/internal -I./Include -DPy_BUILD_CORE \
    -DSOABI='cpython-310-aarch64-linux-gnu' \
    -o Python/dynload_shlib.o ./Python/dynload_shlib.c
gcc -c -Wno-unused-result -Wsign-compare -DNDEBUG -g -fwrapv -O3 -Wall      -std=c99 -Wextra -Wno-unused-result -Wno-unused-parameter -Wno-missing-field-initializers -Werror=implicit-function-declaration -fvisibility=hidden -I./Include/internal -I./Include -DPy_BUILD_CORE -o Modules/config.Modules/config.c
gcc -c -Wno-unused-result -Wsign-compare -DNDEBUG -g -fwrapv -O3 -Wall      -std=c99 -Wextra -Wno-unused-result -Wno-unused-parameter -Wno-missing-field-initializers -Werror=implicit-function-declaration -fvisibility=hidden -I./Include/internal -I./Include -DPy_BUILD_CORE -DPYTHONPATH='' \
    -DPREFIX='/home/tanishwanve/python3.10' \
    -DEEXEC_PREFIX='/home/tanishwanve/python3.10' \
    -DVERSION='3.10' \
    -DVPATH='' \
    -o Modules/getpath.o ./Modules/getpath.c
gcc -c -Wno-unused-result -Wsign-compare -DNDEBUG -g -fwrapv -O3 -Wall      -std=c99 -Wextra -Wno-unused-result -Wno-unused-parameter -Wno-missing-field-initializers -Werror=implicit-function-declaration -fvisibility=hidden -I./Include/internal -I./Include -DPy_BUILD_CORE \
    -DGITVERSION="\`LC_ALL=C ``" \
    -DGITTAG="\`LC_ALL=C ``" \
    -GITBRANCH="\`LC_ALL=C ``" \
    -o Modules/getbuildinfo.o ./Modules/getbuildinfo.c

```

8. The `make` command compiles the Python source code, building object files and modules using the specified configurations, as shown in the detailed compilation process output.

```

tanishwanve@oneway:~/Python-3.10.0$ python -E ./setup.py build
running build
running build_ext
INFO: Can't locate Tcl/Tk libs and/or headers
Python build finished successfully!
The necessary bits to build these optional modules were not found:
_dbm      _tkinter      _uuid
nis
To find the necessary bits, look in setup.py in detect_modules() for the module's name.

The following modules found by detect_modules() in setup.py, have been
built by the Makefile instead, as configured by the Setup files:
_abc      pwd      time

running build_scripts
copying and adjusting /home/tanishwanve/Python-3.10.0/Tools/scripts/pydoc3 -> build/scripts-3.10
copying and adjusting /home/tanishwanve/Python-3.10.0/Tools/scripts/idle3 -> build/scripts-3.10
copying and adjusting /home/tanishwanve/Python-3.10.0/Tools/scripts/2to3 -> build/scripts-3.10
changing mode of build/scripts-3.10/pydoc3 from 664 to 775
changing mode of build/scripts-3.10/idle3 from 664 to 775
changing mode of build/scripts-3.10/2to3 from 664 to 775
renaming build/scripts-3.10/pydoc3 to build/scripts-3.10/pydoc3.10
renaming build/scripts-3.10/idle3 to build/scripts-3.10/idle3.10
renaming build/scripts-3.10/2to3 to build/scripts-3.10/2to3-3.10
gcc -Xlinker -export-dynamic -o Programs/_testembed Programs/_testembed.o libpython3.10.a -lcrypt -ldl -lm -lm
sed -e 's,\_EXENAME@,./Misc/python3.10/bin/python3.10,' < ./Misc/python-config.in >python-config.py
LC_ALL=C sed -e 's,\$\{([A-Za-z0-9_]*)\},\$\'\{1\}\',g' < Misc/python-config.sh >python-config
tanishwanve@oneway:~/Python-3.10.0$ 

```

9. This output confirms that the Python build process completed successfully, highlighting missing optional modules and the creation of necessary scripts and configuration files for the Python installation.

```

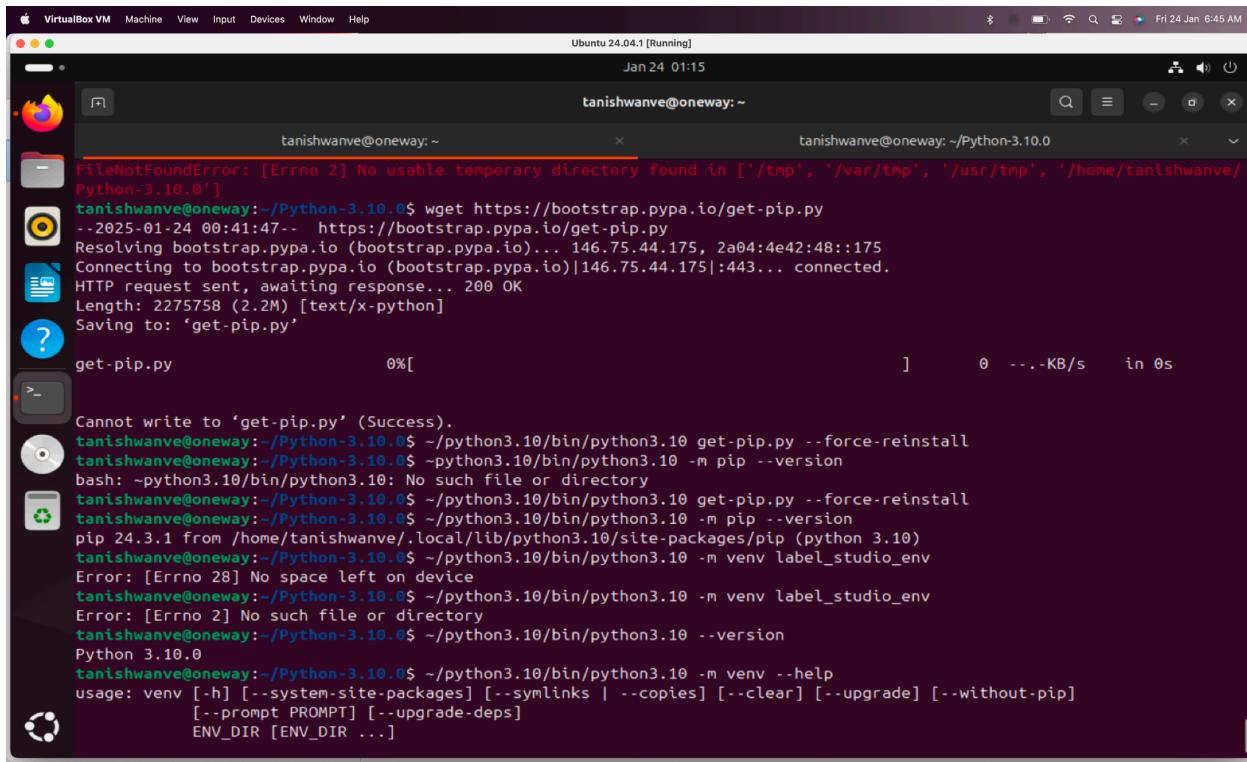
tanishwanve@oneway:~/Python-3.10.0
rm -f /home/tanishwanve/python3.10/bin/python3-intel64; \
(cd /home/tanishwanve/python3.10/bin; ln -s python3.10-intel64 python3-intel64) \
fi
rm -f /home/tanishwanve/python3.10/share/man/man1/python3.1
(cd /home/tanishwanve/python3.10/share/man/man1; ln -s python3.10.1 python3.1)
if test "xupgrade" != "xno" ; then \
    case upgrade in \
        upgrade) ensurepip="--upgrade" ;; \
        install*) ensurepip="" ;; \
    esac; \
    ./python -E -m ensurepip \
        --ensurepip --root=/ ; \
fi
WARNING: Value for scheme.headers does not match. Please report this to <https://github.com/pypa/pip/issues/10151>
distutils: /home/tanishwanve/python3.10/include/python3.10/UNKNOWN
sysconfig: /home/tanishwanve/Python-3.10.0/Include/UNKNOWN
WARNING: Additional context:
user = False
home = None
root = '/'
prefix = None
Looking in links: /tmp/tmpw361crat
Processing /tmp/tmpw361crat/setuptools-57.4.0-py3-none-any.whl
Requirement already satisfied: pip in /home/tanishwanve/.local/lib/python3.10/site-packages (24.3.1)
Installing collected packages: setuptools
WARNING: Value for scheme.headers does not match. Please report this to <https://github.com/pypa/pip/issues/10151>
distutils: /home/tanishwanve/python3.10/include/python3.10/setuptools
sysconfig: /home/tanishwanve/Python-3.10.0/Include/setuptools
Successfully installed setuptools-57.4.0
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 --version
Python 3.10.0
tanishwanve@oneway:~/Python-3.10.0$ 
```

10. This output shows the installation of setuptools(a Python package manager) and verifies the Python version(Python 3.10.0) installed. The warnings are related to mismatched file paths for headers but don't affect the installation.

```

tanishwanve@oneway:~/Python-3.10.0
distutils: /home/tanishwanve/python3.10/include/python3.10/setuptools
sysconfig: /home/tanishwanve/Python-3.10.0/Include/setuptools
Successfully installed setuptools-57.4.0
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 --version
Python 3.10.0
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m ensurepip
Traceback (most recent call last):
  File "/home/tanishwanve/python3.10/lib/python3.10/runpy.py", line 196, in _run_module_as_main
    return _run_code(code, main_globals, None,
  File "/home/tanishwanve/python3.10/lib/python3.10/runpy.py", line 86, in _run_code
    exec(code, run_globals)
  File "/home/tanishwanve/python3.10/lib/python3.10/ensurepip/_main__.py", line 5, in <module>
    sys.exit(ensurepip._main())
  File "/home/tanishwanve/python3.10/lib/python3.10/ensurepip/_init_.py", line 277, in _main
    return _bootstrap(
  File "/home/tanishwanve/python3.10/lib/python3.10/ensurepip/_init_.py", line 160, in _bootstrap
    with tempfile.TemporaryDirectory() as tmpdir:
  File "/home/tanishwanve/python3.10/lib/python3.10/tempfile.py", line 792, in __init__
    self.name = mkdtemp(suffix, prefix, dir)
  File "/home/tanishwanve/python3.10/lib/python3.10/tempfile.py", line 353, in mkdtemp
    prefix, suffix, dir, output_type = _sanitize_params(prefix, suffix, dir)
  File "/home/tanishwanve/python3.10/lib/python3.10/tempfile.py", line 122, in _sanitize_params
    dir = gettempdir()
  File "/home/tanishwanve/python3.10/lib/python3.10/tempfile.py", line 295, in gettempdir
    return _os.fsdecode(_gettempdir())
  File "/home/tanishwanve/python3.10/lib/python3.10/tempfile.py", line 288, in _gettempdir
    tempdir = _get_default_tempdir()
  File "/home/tanishwanve/python3.10/lib/python3.10/tempfile.py", line 220, in _get_default_tempdir
    raise FileNotFoundError(errno.ENOENT,
FileNotFoundError: [Errno 2] No usable temporary directory found in ['/tmp', '/var/tmp', '/usr/tmp', '/home/tanishwanve/Python-3.10.0']
tanishwanve@oneway:~/Python-3.10.0$ 
```

11. The command fails because no usable temporary directory is found in locations like /tmp or /var/tmp This suggests an issue with the system's temporary file configuration or permissions.



```
Ubuntu 24.04.1 [Running]
Jan 24 01:15
tanishwanve@oneway:~ tanishwanve@oneway:~/Python-3.10.0
tanishwanve@oneway:~:~ tanishwanve@oneway:~/Python-3.10.0
tanishwanve@oneway:~/Python-3.10.0$ wget https://bootstrap.pypa.io/get-pip.py
--2025-01-24 00:41:47-- https://bootstrap.pypa.io/get-pip.py
Resolving bootstrap.pypa.io (bootstrap.pypa.io)... 146.75.44.175, 2a04:4e42:48::175
Connecting to bootstrap.pypa.io (bootstrap.pypa.io)|146.75.44.175|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2275758 (2.2M) [text/x-python]
Saving to: 'get-pip.py'

get-pip.py          0%[                ]          0  ---KB/s   in 0s

Cannot write to 'get-pip.py' (Success).
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 get-pip.py --force-reinstall
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m pip --version
bash: ~/python3.10/bin/python3.10: No such file or directory
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 get-pip.py --force-reinstall
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m pip --version
pip 24.3.1 from /home/tanishwanve/.local/lib/python3.10/site-packages/pip (python 3.10)
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m venv label_studio_env
Error: [Errno 28] No space left on device
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m venv label_studio_env
Error: [Errno 2] No such file or directory
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 --version
Python 3.10.0
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m venv --help
usage: venv [-h] [--system-site-packages] [--symlinks | --copies] [--clear] [--upgrade] [--without-pip]
             [--prompt PROMPT] [--upgrade-deps]
             ENV_DIR [ENV_DIR ...]
```

12. I attempted to download the **get-pip.py** script to install pip using **wget**, but it couldn't write due to permission or directory issues. Running **get-pip.py** to reinstall pip also failed, likely because the file wasn't downloaded properly or couldn't be located. Checking the pip version confirmed that pip (version 24.3.1) was already installed. Then, I tried creating a virtual environment (**label_studio_env**) with the **venv** module, but errors occurred, possibly due to missing directories or space issues. Verifying the Python version confirmed Python 3.10.0 was installed, I used the **venv --help** command to check its options.

```
Ubuntu 24.04.1 [Running]
Jan 24 01:15
tanishwanve@oneway:~
```

```
Creates virtual Python environments in one or more target directories.

positional arguments:
  ENV_DIR          A directory to create the environment in.

options:
  -h, --help        show this help message and exit
  --system-site-packages
  --symlinks        Give the virtual environment access to the system site-packages dir.
  --copies          Try to use copies rather than symlinks, when symlinks are not the default for the platform.
  --clear           Delete the contents of the environment directory if it already exists, before environment creation.
  --upgrade         Upgrade the environment directory to use this version of Python, assuming Python has been upgraded in-place.
  --without-pip     Skips installing or upgrading pip in the virtual environment (pip is bootstrapped by default)
  --prompt PROMPT   Provides an alternative prompt prefix for this environment.
  --upgrade-deps    Upgrade core dependencies: pip setuptools to the latest version in PyPI

Once an environment has been created, you may wish to activate it, e.g. by sourcing an activate script in its bin directory.
tanishwanve@oneway:~/Python-3.10.0$ ~/python3.10/bin/python3.10 -m venv label_studio_env
Error: [Errno 2] No such file or directory
tanishwanve@oneway:~/Python-3.10.0$ cd ~
tanishwanve@oneway:~$ ~/python3.10/bin/python3.10 -m venv label_studio_env
tanishwanve@oneway:~$ ls label_studio_env
bin  include  lib  lib64  pyvenv.cfg
tanishwanve@oneway:~$ source label_studio_env/bin/activate
(label_studio_env) tanishwanve@oneway:~$
```

13.I attempted to create a virtual environment named **label_studio_env** using **venv** but initially encountered a "No such file or directory" error. After navigating to my home directory, I successfully created the environment and activated it using the **source label_studio_env/bin/activate** command, as indicated by the (**label_studio_env**) prompt.

```
tanishwanve@oneway:~/Python-3.10.0$ cd ~
tanishwanve@oneway: ~$ ./python3.10/bin/python3.10 -m venv label_studio_env
tanishwanve@oneway: ~$ ls label_studio_env
bin include lib lib64 pyvenv.cfg
tanishwanve@oneway: ~$ source label_studio_env/bin/activate
(label_studio_env) tanishwanve@oneway: ~$ pip install label-studio
Collecting label-studio
  Using cached label_studio-1.15.0-py3-none-any.whl (60.6 MB)
Collecting ordered-set==4.0.2
  Using cached ordered-set-4.0.2.tar.gz (10 kB)
Requirement already satisfied: Django<4.3.0,>=4.2.13 in ./label_studio_env/lib/python3.10/site-packages (from label-studio) (4.2.18)
Collecting rules==3.4
  Using cached rules-3.4-py2.py3-none-any.whl (25 kB)
Collecting lxml[html-clean]>=4.9.4
  Using cached lxml-5.3.0-cp310-cp310-manylinux_2_28_aarch64.whl (4.8 MB)
Collecting django-ranged-fileresponse>=0.1.2
  Using cached django-ranged-fileresponse-0.1.2.tar.gz (2.7 kB)
Collecting django-extensions==3.2.3
  Using cached django_extensions-3.2.3-py3-none-any.whl (229 kB)
Requirement already satisfied: pytz<2023.0,>=2022.1 in ./label_studio_env/lib/python3.10/site-packages (from label-studio) (2022.7.1)
Collecting lockfile>=0.12.0
  Using cached lockfile-0.12.2-py2.py3-none-any.whl (13 kB)
Requirement already satisfied: urllib3<2.0.0,>=1.26.18 in ./label_studio_env/lib/python3.10/site-packages (from label-studio) (1.26.20)
Collecting django-environ==0.10.0
  Using cached django_environ-0.10.0-py3-none-any.whl (19 kB)
Collecting django-user-agents==0.4.0
  Using cached django_user_agents-0.4.0-py3-none-any.whl (8.6 kB)
Requirement already satisfied: numpy<2.0.0,>=1.26.4 in ./label_studio_env/lib/python3.10/site-packages (from label-studio)
```

14. I activated the virtual environment (**label_studio_env**) and ran **pip install label-studio**. This fetched and installed the necessary dependencies for Label Studio and stored them in the environment's site-packages folder.

```
s, django-migration-linter, django-filter, django-extensions, django-environ, django-debug-toolbar, django-csp, django-cors-headers, django-annoying, defusedxml, colorama, boto3, boto, bleach, azure-storage-blob, attr, label-studio
Attempting uninstall: botocore
  Found existing installation: botocore 1.36.4
  Uninstalling botocore-1.36.4:
    Successfully uninstalled botocore-1.36.4
Attempting uninstall: setuptools
  Found existing installation: setuptools 57.4.0
  Uninstalling setuptools-57.4.0:
    Successfully uninstalled setuptools-57.4.0
  Running setup.py install for ordered-set ... done
  Running setup.py install for drf-generators ... done
  Running setup.py install for drf-flex-fields ... done
  Running setup.py install for django-ranged-fileresponse ... done
  Running setup.py install for attr ... done
Successfully installed appdirs-1.4.4 attr-0.3.1 azure-core-1.32.0 azure-storage-blob-12.24.1 bleach-5.0.1 boto-2.49.0 botocore-1.36.5 colorama-0.4.6 cryptography-44.0.0 datamodel-code-generator-0.26.1 defusedxml-0.7.1 distro-1.9.0 django-annoying-0.10.6 django-cors-headers-3.6.0 django-csp-3.2.1 django-environ-0.10.0 django-extensions-3.2.3 django-filter-2.4.0 django-migration-linter-5.1.0 django-model-utils-4.1.1 django-ranged-fileresponse-0.1.2 django-rq-2.5.1 django-storages-1.12.3 django-user-agents-0.4.0 django-restframework-3.15.2 drf-dynamic-fields-0.3.0 drf-flex-fields-0.9.5 drf-generators-0.3.0 expiringdict-1.2.2 google-cloud-appengine-logging-1.5.0 google-cloud-audit-log-0.3.0 google-cloud-core-2.4.1 google-cloud-logging-3.11.3 google-cloud-storage-2.19.0 google-resumable-media-2.7.2 grpc-google-iam-v1-14.0 httpx-0.18.0 humansignal-drf-yasg-1.20.1 ijson-3.3.0 inflection-0.5.1 isodate-0.7.2 jiter-0.8.2 jsf-0.11.2 label-studio-1.15.0 label-studio-sdk-1.0.8 launchdarkly-server-sdk-8.2.1 lockfile-0.12.2 lxml-5.3.0 nltk-3.9.1 openai-1.60.0 opentelemetry-api-1.29.0 ordered-set-4.0.2 pandas-2.2.3 psycopg2-binary-2.9.10 pyboxen-1.3.0 python-json-logger-2.0.4 rules-3.4 sentry-sdk-2.20.0 setuptools-75.8.0 wheel-0.40.0
WARNING: You are using pip version 21.2.3; however, version 24.3.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
(label_studio_env) tanishwanve@oneway: ~$
```

15. Label Studio and its dependencies are being installed, with older versions of setuptools uninstalled and replaced by newer versions; other necessary libraries are successfully installed.

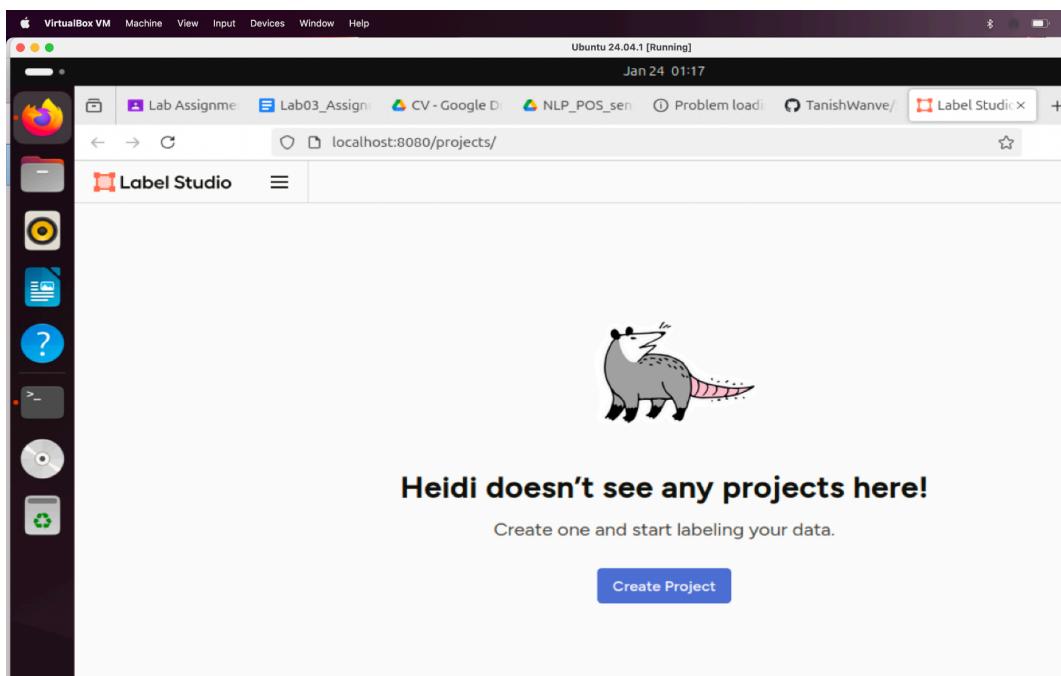
```

Ubuntu 24.04.1 [Running]
Jan 24 01:17
tanishwanve@oneway:~ tanishwanve@oneway:~/Python-3.10.0
tanishwanve@oneway:~ tanishwanve@oneway:~/Python-3.10.0
You should consider upgrading via the '/home/tanishwanve/label_studio_env/bin/python3.10 -m pip install --upgrade pip' command.
(label_studio_env) tanishwanve@oneway:~$ label-studio &
[1] 244382
(label_studio_env) tanishwanve@oneway:~$ => Database and media directory: /home/tanishwanve/.local/share/label-studio
=> Static URL is set to: /static/
=> Database and media directory: /home/tanishwanve/.local/share/label-studio
=> Static URL is set to: /static/
Read environment variables from: /home/tanishwanve/.local/share/label-studio/.env
get 'SECRET_KEY' casted as '<class 'str'>' with default ''
Starting new HTTPS connection (1): pypi.org:443
https://pypi.org:443 "GET /pypi/label-studio/json HTTP/1.1" 200 33651
January 24, 2025 - 01:16:58
Django version 4.2.18, using settings 'label_studio.core.settings.label_studio'
Starting development server at http://0.0.0.0:8080/
Quit the server with CONTROL-C.

[2025-01-24 01:17:02,696] [django.server::log_message::212] [INFO] "GET / HTTP/1.1" 302 0
[2025-01-24 01:17:02,696] [django.server::log_message::212] [INFO] "GET / HTTP/1.1" 302 0
[2025-01-24 01:17:02,770] [django.server::log_message::212] [INFO] "GET /projects/ HTTP/1.1" 200 33140
[2025-01-24 01:17:02,770] [django.server::log_message::212] [INFO] "GET /projects/ HTTP/1.1" 200 33140
[2025-01-24 01:17:02,887] [django.server::log_message::212] [INFO] "GET /static/css/uikit.e398ae7b8534.css HTTP/1.1" 200
3867
[2025-01-24 01:17:02,887] [django.server::log_message::212] [INFO] "GET /static/css/uikit.e398ae7b8534.css HTTP/1.1" 200
3867
[2025-01-24 01:17:02,925] [django.server::log_message::212] [INFO] "GET /static/css/main.03e0d1342adf.css HTTP/1.1" 200
15925
[2025-01-24 01:17:02,925] [django.server::log_message::212] [INFO] "GET /static/css/main.03e0d1342adf.css HTTP/1.1" 200
15925
[2025-01-24 01:17:02,939] [django.server::log_message::212] [INFO] "GET /react-app/main.js?v=df34d5 HTTP/1.1" 200 122629
1

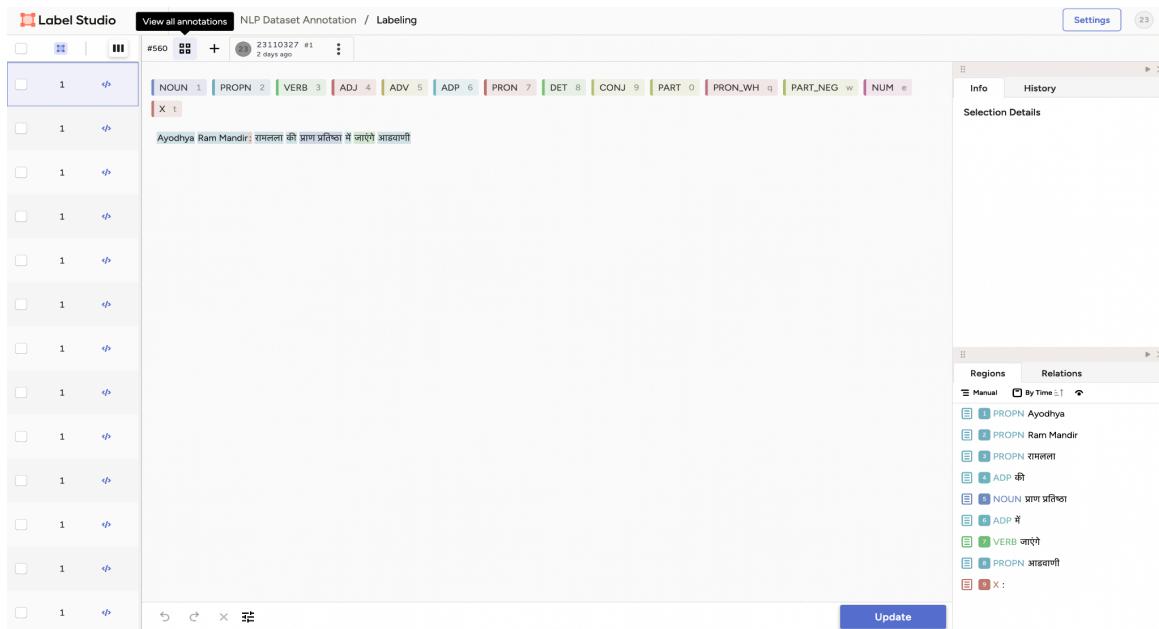
```

The command **label-studio** & starts the Label Studio server in the background. The output shows that the database and media directories are initialized, environment variables are read, and the Django development server (Label Studio backend) starts at <http://0.0.0.0:8080/>.

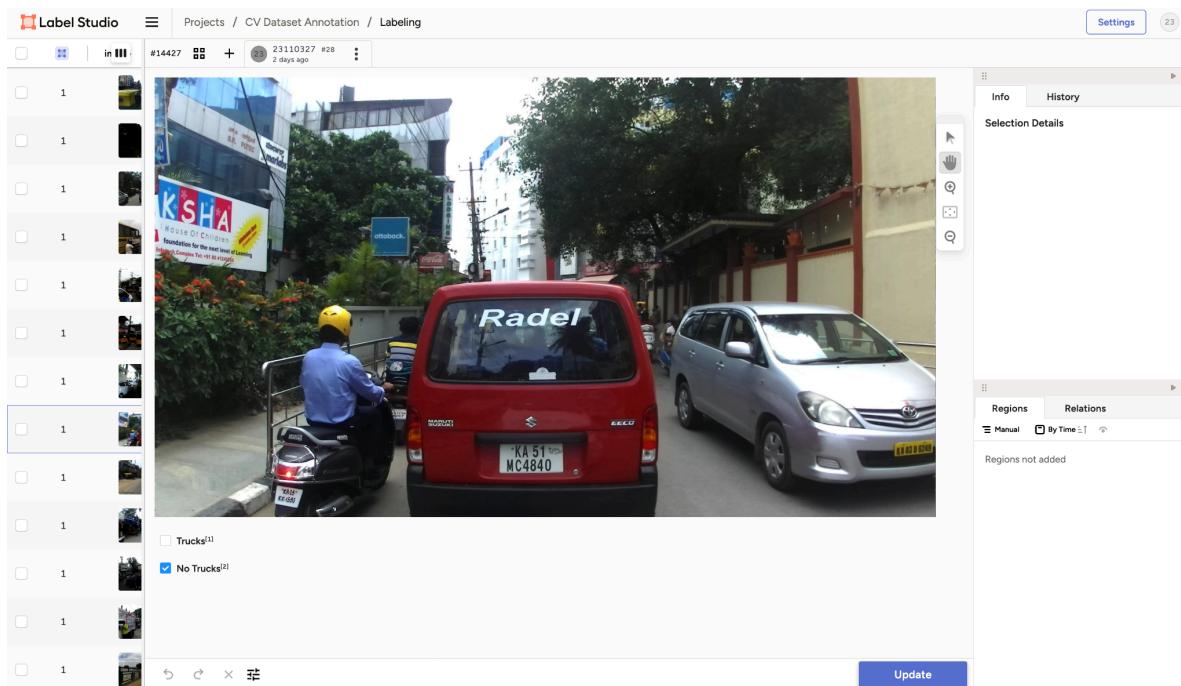


The browser shows the Label Studio web interface running at <http://localhost:8080/projects/>. It confirms that the server is active.

Task 2: Annotating a Dataset using Label Studio



Annotating NLP dataset using Label Studio



Annotating CV dataset using Label Studio

I have attached the CSV files for the Annotated dataset of NLP and CV files provided by both team members and a CV annotated file from a member of another team in the github link.

Task 3: Implementing Inter-Annotator Agreement

Description of Fleiss' Kappa and Cohen's Kappa

Cohen's Kappa: Cohen's Kappa is a statistical measure used to assess the level of agreement between two annotators (or raters) when categorizing items.

Formula for Cohen's Kappa:

$$K = \frac{Po - Pe}{1 - Pe}$$

- Po: The observed agreement (proportion of items on which annotators agree).
- Pe: The expected agreement by chance (calculated based on the marginal probabilities of each annotator's categories).

Range of Cohen's Kappa:

- K<0: Poor agreement (less than chance).
- 0.01 - 0.20: Slight agreement.
- 0.21 - 0.40: Fair agreement.
- 0.41 - 0.60: Moderate agreement.
- 0.61 - 0.80: Substantial agreement.
- 0.81 - 1.00: Almost perfect agreement.

Cohen's Kappa for NLP Dataset: 0.583

A Cohen's Kappa value of **0.583** indicates **moderate agreement** between the two annotators. This means that while there is reasonable consistency in their labeling, there are still some discrepancies. It suggests that the annotators are fairly aligned but not perfectly consistent.

Fleiss' Kappa: Fleiss' Kappa is an extension of Cohen's Kappa for more than two annotators. It assesses the level of agreement among multiple annotators rating a set of items into categories. It also adjusts for chance agreement.

Formula for Fleiss' Kappa:

$$K = \frac{\bar{P} - \bar{Pe}}{1 - \bar{Pe}}$$

- \bar{P} : The observed agreement, calculated across all items and annotators.
- \bar{Pe} : The expected agreement due to chance.

Range of Fleiss' Kappa:

- $K < 0$: Poor agreement.
- 0.01–0.20: Slight agreement.
- 0.21–0.40: Fair agreement.
- 0.41–0.60: Moderate agreement.
- 0.61–0.80: Substantial agreement.
- 0.81–1.00: Almost perfect agreement.

Fleiss' Kappa for CV Dataset: 0.900

Fleiss' Kappa for CV Dataset (3 annotators): 0.726

The two Fleiss' Kappa values shown indicate the level of agreement among annotators:

1. **Fleiss' Kappa: 0.900** - This value reflects almost perfect agreement among annotators for the dataset involving 2 annotators. (Team members)
2. **Fleiss' Kappa (3 annotators): 0.726** - This indicates substantial agreement among 3 annotators, which is slightly lower than the 2-annotator agreement.