CS203 - Lab 3 Assignment Task 1

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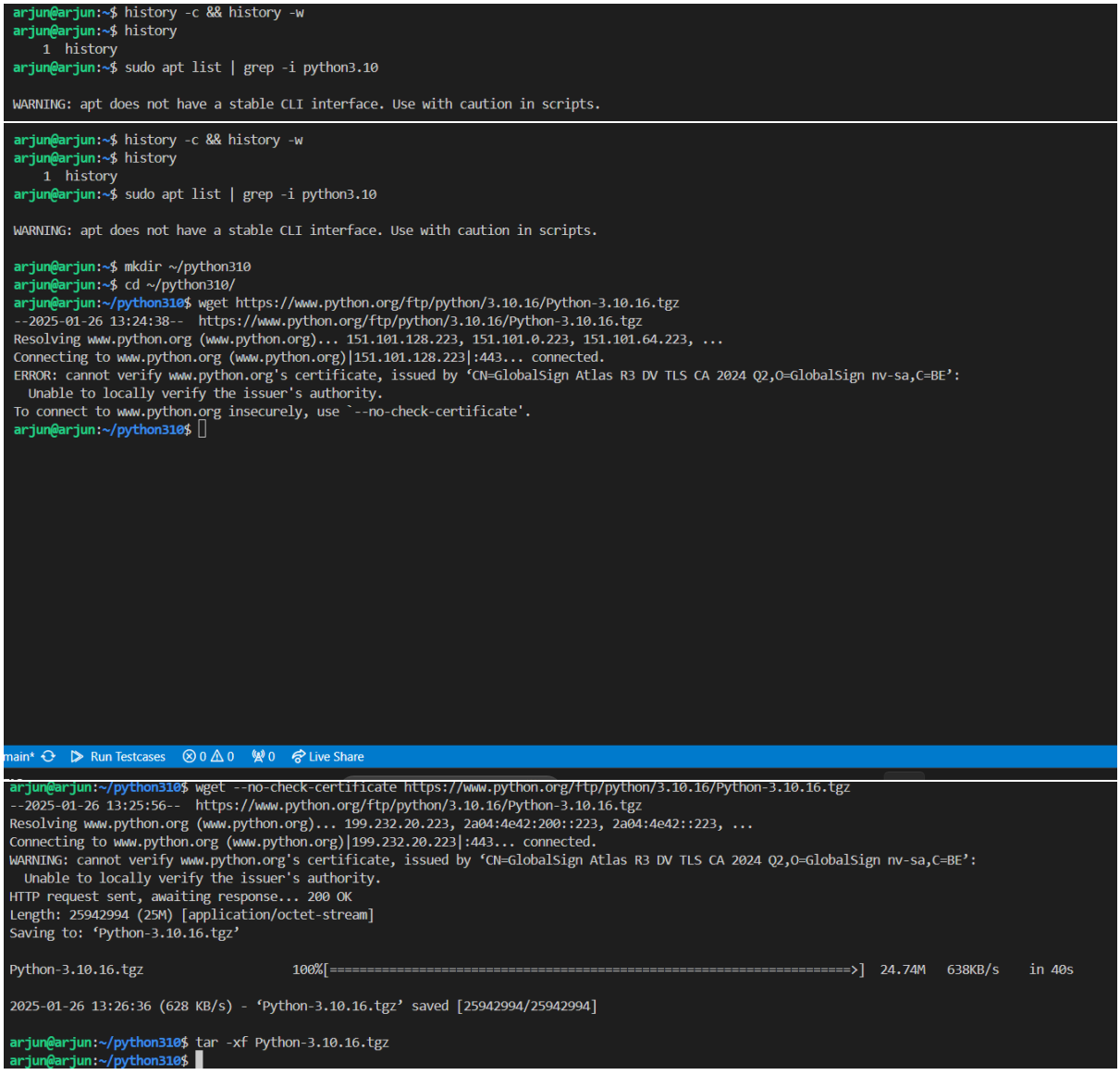
Note: We have ran all the commands on a linux ubuntu virtual machine through an SSH connection. The proper documentation is mentioned in the “Lab3_STTAI_Task1.pdf” file.

Clearing History and Installation of Python:



```
checking for builtin __atomic_load_n and __atomic_store_n functions... yes
checking for ensurepip... upgrade
checking if the dirent structure of a d_type field... yes
checking for the Linux getrandom() syscall... yes
checking for the getrandom() function... yes
checking for library containing shm_open... none required
checking for sys/mman.h... (cached) yes
checking for shm_open... yes
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 whether OpenSSL provides required APIs... yes
checking for --with-ssl-default-suites... python
checking for --with-builtin-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
creating Modules/Setup.local
creating Makefile
arjun@arjun:~/python310/Python-3.10.16$ make -j$(nproc)
arjun/python310/Python-3.10.16/Modules/_ctypes/stgdict.o -DPy_BUILD_CORE_MODULE -DHAVE_FFI_PREP_CIF_VAR=1 -DHAVE_FFI_PREP_CLOSURE_LOC=1 -DHAVE_FFI_C
OSURE_ALLOC=1
gcc -shared -fno-semantic-interposition build/temp.linux-x86_64-3.10/home/arjun/python310/Python-3.10.16/Modules/_ctypes/_ctypes.o build/temp.linux-
86_64-3.10/home/arjun/python310/Python-3.10.16/Modules/_ctypes/callbacks.o build/temp.linux-x86_64-3.10/home/arjun/python310/Python-3.10.16/Modules/
ctypes/callproc.o build/temp.linux-x86_64-3.10/home/arjun/python310/Python-3.10.16/Modules/_ctypes/cfield.o build/temp.linux-x86_64-3.10/home/arjun/
ython310/Python-3.10.16/Modules/_ctypes/stgdict.o -L/usr/lib/x86_64-linux-gnu -L/usr/local/lib -lffi -ldl -o build/lib.linux-x86_64-3.10/_ctypes.cpy
hon-310-x86_64-linux-gnu.so

The necessary bits to build these optional modules were not found:
_dbm                  _tkinter              _uuid
his
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/arjun/python310/Python-3.10.16/Tools/scripts/pydoc3 -> build/scripts-3.10
copying and adjusting /home/arjun/python310/Python-3.10.16/Tools/scripts/idle3 -> build/scripts-3.10
copying and adjusting /home/arjun/python310/Python-3.10.16/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 -c -Wno-unused-result -Wsign-compare -DNDEBUG -g -fwrapv -O3 -Wall    -fno-semantic-interposition -std=c99 -Wextra -Wno-unused-result -Wno-unuse
-parameter -Wno-missing-field-initializers -Werror=implicit-function-declaration -fvisibility=hidden -fprofile-use -fprofile-correction -I./Include/
nternal  -I. -I./Include    -DPy_BUILD_CORE -o Programs/_testembed.o ./Programs/_testembed.c
gcc    -fno-semantic-interposition  -Xlinker -export-dynamic -o Programs/_testembed Programs/_testembed.o libpython3.10.a -lcrypt -ldl  -lm   -lm
make[1]: Leaving directory '/home/arjun/python310/Python-3.10.16'
arjun@arjun:~/python310/Python-3.10.16$ make install
```

```
arjun@arjun:~/python310/Python-3.10.16$ echo 'export PATH="$HOME/python310/bin:$PATH"' >> ~/.bashrc
arjun@arjun:~/python310/Python-3.10.16$ source ~/.bashrc
arjun@arjun:~/python310/Python-3.10.16$ python3 --version
Python 3.10.16
arjun@arjun:~/python310/Python-3.10.16$
```

```
arjun@arjun:~/local$ ^C
arjun@arjun:~/local$ # Create dirs and download Python
mkdir -p ~/pythonbuild && cd ~/pythonbuild
wget https://www.python.org/ftp/python/3.10.16/Python-3.10.16.tgz
tar -xzf Python-3.10.16.tgz
cd Python-3.10.16

# Configure and install to home directory
./configure --enable-optimizations --prefix=$HOME/.local
make -j$(nproc)
make install

# Add to PATH (append to ~/.bashrc)
echo 'export PATH=$HOME/.local/bin:$PATH' >> ~/.bashrc
source ~/.bashrc

# Cleanup
cd ~
rm -rf ~/pythonbuild

# Verify installation
python3 --version
```

```
arjun@arjun:~$ # Create installation directories
mkdir -p ~/pythonbuild ~/opt/python3.10.16
cd ~/pythonbuild

# Download with SSL certificate workaround
wget --no-check-certificate https://www.python.org/ftp/python/3.10.16/Python-3.10.16.tgz

# Extract source
tar xzf Python-3.10.16.tgz
cd Python-3.10.16

# Build dependencies check
command -v make >/dev/null 2>&1 || { echo "Please install build-essential"; exit 1; }
command -v gcc >/dev/null 2>&1 || { echo "Please install gcc"; exit 1; }

# Configure and build
./configure --prefix=$HOME/opt/python3.10.16 \
    --enable-optimizations \
    --with-ensurepip=install
make -j$(nproc)
make install

# Add to PATH
echo 'export PATH=$HOME/opt/python3.10.16/bin:$PATH' >> ~/.bashrc
--2025-01-26 09:34:29--  https://www.python.org/ftp/python/3.10.16/Python-3.10.16.tgz
Resolving www.python.org (www.python.org)... 151.101.64.223, 151.101.128.223, 151.101.192.223, ...
Connecting to www.python.org (www.python.org)|151.101.64.223|:443... connected.
WARNING: cannot verify www.python.org's certificate, issued by ‘CN=GlobalSign Atlas R3 DV TLS CA 2024 Q2,O=GlobalSign nv-sa,C=BE’:
  Unable to locally verify the issuer's authority.
HTTP request sent, awaiting response... 200 OK
Length: 25942994 (25M) [application/octet-stream]
Saving to: ‘Python-3.10.16.tgz’
```

```
                install|*) ensurepip="" ;; \
        esac; \
         ./python -E -m ensurepip \
                $ensurepip --root=/ ; \
fi
Looking in links: /tmp/tmpsagsnmqz
Processing /tmp/tmpsagsnmqz/setuptools-65.5.0-py3-none-any.whl
Processing /tmp/tmpsagsnmqz/pip-23.0.1-py3-none-any.whl
Installing collected packages: setuptools, pip
  WARNING: The scripts pip3 and pip3.10 are installed in '/home/arjun/opt/python3.10.16/bin' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this warning, use --no-warn-script-location.
Successfully installed pip-23.0.1 setuptools-65.5.0
arjun@arjun:~/pythonbuild/Python-3.10.16$ ^C
arjun@arjun:~/pythonbuild/Python-3.10.16$ export PATH=$HOME/opt/python3.10.16/bin:$PATH
arjun@arjun:~/pythonbuild/Python-3.10.16$
```

```
arjun@arjun:~/pythonbuild/Python-3.10.16$ # Create and enter project directory
mkdir ~/labelstudio_project
cd ~/labelstudio_project

# Create virtual environment
python3.10 -m venv venv

# Activate virtual environment (Windows)
.\venv\Scripts\activate

# Update pip
python -m pip install --upgrade pip

# Install label studio
pip install label-studio
```

Here we see a pip error, which was resolved by the below commands:

```
arjun@arjun:~/pythonbuild/Python-3.10.16$ ^C
arjun@arjun:~/pythonbuild/Python-3.10.16$ export PATH=$HOME/opt/python3.10.16/bin:$PATH
arjun@arjun:~/pythonbuild/Python-3.10.16$ ^C
arjun@arjun:~/pythonbuild/Python-3.10.16$ python3 --version
Python 3.10.16
arjun@arjun:~/pythonbuild/Python-3.10.16$ ^C
arjun@arjun:~/pythonbuild/Python-3.10.16$ # Create and enter project directory
mkdir ~/labelstudio_project
cd ~/labelstudio_project

# Create virtual environment
python3.10 -m venv venv

# Activate virtual environment (Windows)
.\venv\Scripts\activate

# Update pip
python -m pip install --upgrade pip

# Install label studio
pip install label-studio

^[[D^[[D^[[D.venvScriptsactivate: command not found
Command 'python' not found, did you mean:
  command 'python3' from deb python3
  command 'python' from deb python-is-python3
^[[DCommand 'pip' not found, but can be installed with:
sudo apt install python3-pip
arjun@arjun:~/labelstudio_project$
arjun@arjun:~/labelstudio_project$
```

```
arjun@arjun:~/labelstudio_project$
arjun@arjun:~/labelstudio_project$ ^C
arjun@arjun:~/labelstudio_project$ # Get absolute path to Python 3.10
PYTHON_PATH=$HOME/opt/python3.10.16/bin/python3

# Create project directory
mkdir -p ~/labelstudio_project
cd ~/labelstudio_project

# Create virtual environment with specific Python
$PYTHON_PATH -m venv .venv

# Source the virtual environment (Linux/Mac)
source .venv/bin/activate

# Ensure pip is installed in venv
curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
$PYTHON_PATH get-pip.py --user

# Install label studio
$HOME/.local/bin/pip install --user label-studio

# Add to PATH in bashrc if not already there
echo 'export PATH=$HOME/.local/bin:$PATH' >> ~/.bashrc
source ~/.bashrc
```

As we can see, label studio is working and by using port forwarding, we can open label studio in a web browser.

```
-0.7.1 deprecated-1.2.17 distro-1.9.0 django-annoying-0.10.6 django-cors-headers-3.6.0 django-csp-3.7 django-debug-toolbar-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 djangorestframework-3.15.2 dnspython-2.7.0 drf-dynamic-fields-0.3.0 drf-flex-fields-0.9.5 drf-genera
tors-0.3.0 email-validator-2.2.0 exceptiongroup-1.2.2 expiringdict-1.2.2 faker-35.0.0 genson-1.3.0 google-api-core-2.24.0 google-auth-2.38.0 google-c
loud-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-crc3
2c-1.6.0 google-resumable-media-2.7.2 googleapis-common-protos-1.66.0 grpc-google-iam-v1-0.14.0 grpcio-1.70.0 grpcio-status-1.70.0 h11-0.14.0 httpcor
e-1.0.7 httpx-0.28.1 humansignal-drf-yasg-1.21.10.post1 idna-3.10 ijson-3.3.0 importlib-metadata-8.5.0 inflect-5.6.2 inflection-0.5.1 isodate-0.7.2 i
sort-5.13.2 jinja2-3.1.5 jiter-0.8.2 jmespath-1.0.1 joblib-1.4.2 jsf-0.11.2 jsonschema-4.23.0 jsonschema-specifications-2024.10.1 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 lxml-html-clean-0.4.1 markdown-it-py-3.0.0 mdurl-0.1.2 mypy-extensio
ns-1.0.0 nltk-3.9.1 numpy-1.26.4 openai-1.60.1 opentelemetry-api-1.29.0 ordered-set-4.0.2 packaging-24.2 pandas-2.2.3 pathspec-0.12.1 platformdirs-4.
3.6 proto-plus-1.25.0 protobuf-5.29.3 psycopg2-binary-2.9.10 pyRFC3339-2.0.1 pyasn1-0.6.1 pyasn1-modules-0.4.1 pyboxen-1.3.0 pycparser-2.22 pydantic-
2.10.6 pydantic-core-2.27.2 pygments-2.19.1 python-dateutil-2.9.0.post0 python-json-logger-2.0.4 pytz-2022.7.1 pyyaml-6.0.2 redis-3.5.3 referencing-0
.36.2 regex-2024.11.6 requests-2.32.3 requests-mock-1.12.1 rich-13.9.4 rpds-py-0.22.3 rq-1.10.1 rsa-4.9 rstr-3.2.2 rules-3.4 s3transfer-0.11.2 semver
-3.0.4 sentry-sdk-2.20.0 setuptools-75.8.0 six-1.17.0 smart-open-7.1.0 sniffio-1.3.1 sqlparse-0.5.3 toml-0.10.2 tomli-2.2.1 tqdm-4.67.1 typing_extens
ions-4.12.2 tzdata-2025.1 ua-parser-1.0.0 ua-parser-builtins-0.18.0.post1 ujson-5.10.0 uritemplate-4.1.1 urllib3-1.26.20 user-agents-2.2.0 webencodin
gs-0.5.1 wheel-0.40.0 wrapt-1.17.2 xmljson-0.2.1 zipp-3.21.0
arjun@arjun:~/labelstudio_project$ ^C
arjun@arjun:~/labelstudio_project$ # Check installations
which pip
pip --version
label-studio --version
/home/arjun/.local/bin/pip
pip 24.3.1 from /home/arjun/.local/lib/python3.10/site-packages/pip (python 3.10)
=> Database and media directory: /home/arjun/.local/share/label-studio
=> Static URL is set to: /static/
=> Database and media directory: /home/arjun/.local/share/label-studio
=> Static URL is set to: /static/
/home/arjun/.local/share/label-studio/.env not found - if you're not configuring your environment separately, check this.
get 'SECRET_KEY' casted as '<class 'str'>' with default ''
Warning: SECRET_KEY not found in environment variables. Will generate a random key.
Starting new HTTPS connection (1): pypi.org:443
https://pypi.org:443 "GET /pypi/label-studio/json HTTP/1.1" 200 33651
Initializing database..
```

Here, we have saved the history and I have attached screenshots to show the history.

```
^Carjun@arjun:~/labelstudio_project$ history > user_history.txt
arjun@arjun:~/labelstudio_project$ history
    1  history
    2  sudo apt list | grep -i python3.10
    3  # Create dirs and download Python
    4  mkdir -p ~/pythonbuild && cd ~/pythonbuild
    5  wget https://www.python.org/ftp/python/3.10.16/Python-3.10.16.tgz
    6  tar -xzf Python-3.10.16.tgz
    7  cd Python-3.10.16
    8  # Configure and install to home directory
    9  ./configure --enable-optimizations --prefix=$HOME/.local
   10  make -j$(nproc)
   11  make install
   12  # Add to PATH (append to ~/.bashrc)
   13  echo 'export PATH=$HOME/.local/bin:$PATH' >> ~/.bashrc
   14  source ~/.bashrc
   15  # Cleanup
   16  cd ~
   17  rm -rf ~/pythonbuild
   18  # Verify installation
   19  python3 --version
   20  # Create installation directories
   21  mkdir -p ~/pythonbuild ~/opt/python3.10.16
   22  cd ~/pythonbuild
```

```
21  mkdir -p ~/pythonbuild ~/opt/python3.10.16
22  cd ~/pythonbuild
23  # Download with SSL certificate workaround
24  wget --no-check-certificate https://www.python.org/ftp/python/3.10.16/Python-3.10.16.tgz
25  # Extract source
26  tar xzf Python-3.10.16.tgz
27  cd Python-3.10.16
28  # Build dependencies check
29  command -v make >/dev/null 2>&1 || { echo "Please install build-essential"; exit 1; }
30  command -v gcc >/dev/null 2>&1 || { echo "Please install gcc"; exit 1; }
31  # Configure and build
32  ./configure --prefix=$HOME/opt/python3.10.16     --enable-optimizations     --with-ensurepip=install
33  make -j$(nproc)
34  make install
35  # Add to PATH
36  echo 'export PATH=$HOME/opt/python3.10.16/bin:$PATH' >> ~/.bashrc
37  export PATH=$HOME/opt/python3.10.16/bin:$PATH
38  python3 --version
39  # Create and enter project directory
40  mkdir ~/labelstudio_project
41  cd ~/labelstudio_project
42  # Create virtual environment
43  python3.10 -m venv venv
44  # Activate virtual environment (Windows)
45  .\venv\Scripts\activate
46  # Update pip
47  python -m pip install --upgrade pip
48  # Install label studio
49  pip install label-studio
50  # Get absolute path to Python 3.10
51  PYTHON_PATH=$HOME/opt/python3.10.16/bin/python3
52  # Create project directory
53  mkdir -p ~/labelstudio_project
54  cd ~/labelstudio_project
```

```
40  mkdir ~/labelstudio_project
41  cd ~/labelstudio_project
42  # Create virtual environment
43  python3.10 -m venv venv
44  # Activate virtual environment (Windows)
45  .\venv\Scripts\activate
46  # Update pip
47  python -m pip install --upgrade pip
48  # Install label studio
49  pip install label-studio
50  # Get absolute path to Python 3.10
51  PYTHON_PATH=$HOME/opt/python3.10.16/bin/python3
52  # Create project directory
53  mkdir -p ~/labelstudio_project
54  cd ~/labelstudio_project
55  # Create virtual environment with specific Python
56  $PYTHON_PATH -m venv .venv
57  # Source the virtual environment (Linux/Mac)
58  source .venv/bin/activate
59  # Ensure pip is installed in venv
60  curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
61  $PYTHON_PATH get-pip.py --user
62  # Install label studio
63  $HOME/.local/bin/pip install --user label-studio
64  # Add to PATH in bashrc if not already there
65  echo 'export PATH=$HOME/.local/bin:$PATH' >> ~/.bashrc
66  source ~/.bashrc
67  # Check installations
68  which pip
69  pip --version
70  label-studio --version
71  history > user_history.txt
72  history
arjun@arjun:~/labelstudio_project$
```