CREATE A CLONED PYTHON ENVIRONMENT FOR ARCGIS PRO DEEP LEARNING PACKAGE

PART 1. Create a cloned python environment

1. Go to ⊞ Start – ArcGIS – Python Command Prompt (right click) – More – Run as administrator (you may need to type in your administrator password)

You will see the Python Command Prompt window opened with the directory of the ArcGIS default Python environment arcgispro-py3 displayed. The parenthesis enclosed is the name of the activated Python environment name, which is consisted with the default environment.

```
(arcgispro-py3) C:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3>
```

2. type the command `conda env list`
3. Press ENTER like the following:

```
(arcgispro-py3) C:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3>conda env list
```

   You will see there should have two Python environments listed. And the arcgispro-py3 was marked with a "*", which means again that this is the activated Python environment at this moment.

```
(arcgispro-py3) C:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3>conda env list
# conda environments:
#
base                     C:\Program Files\ArcGIS\Pro\bin\Python
arcgispro-py3         *   C:\Program Files\ArcGIS\Pro\bin\Python\envs\arcgispro-py3
```

4. Type the following command to create a cloned environment based on the ArcGIS pro default/activated Python environment. Please make sure you included `--pinned` in the end of the command.

```
conda create --clone arcgispro-py3 --name arcgispro-py3_dl --pinned
```

It may take a few minutes for the clone process to finish. Please wait until the python prompt appears before proceeding to Part two.

PART 2. Install ArcGIS Pro Deep Learning package

5. We need to activate the cloned Python environment.
   a. Please type in the following command and press ENTER.

   ```
   proswap arcgispro-py3_dl
   ```

   b. Now install deep-learning-essentials with the following command then hit enter, type in "y" if prompt.

   ```
   Conda install -c esri deep-learning-essentials
   ```

   The installation process may take a few minutes. Please be patient and do not close the Python windows. You should see the following when the installation is running.

```
(arcgispro_py3_dl) (arcgispro_py3_dl) C:\Users\Di\AppData\Local\ESRI\conda\envs\arcgispro_py
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: C:\Users\Di\AppData\Local\ESRI\conda\envs\arcgispro_py3_dl

  added / updated specs:
    - deep-learning-essentials


The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    cryptography-42.0.4        |          py39_0          4.2 MB  esri
    json5-0.9.14               |           py_0            20 KB  esri
    krb5-1.21.2                |              1           687 KB  esri
    libpng-1.6.42              |              3           335 KB  esri
    libprotobuf-3.21.12        |              3           1.8 MB  esri
    libtiff-4.6.0              |              2           857 KB  esri
    matplotlib-3.6.3           | py39_arcgispro_2           8 KB  esri
    oauthlib-3.2.2             |           py_0            94 KB  esri
    openssl-3.0.13             |              0           2.5 MB  esri
    orc-1.8.3                  |              2           430 KB  esri
    pip-23.3.2                 |          py39_0          2.5 MB  esri
    prompt-toolkit-3.0.42      |           py_0           263 KB  esri
    prompt_toolkit-3.0.42      |              0             5 KB  esri
    protobuf-3.21.12           |          py39_1          216 KB  esri
    pybind11-2.10.4            |              2           156 KB  esri
    pygments-2.17.2            |           py_0           839 KB  esri
    pyopenssl-24.0.0           |   py39haa95532_0           99 KB
    pytest-7.4.3               |          py39_0          517 KB  esri
    pyzmq-25.0.2               |          py39_2          390 KB  esri
    setuptools-68.2.2          |          py39_0          1.2 MB  esri
    sqlite-3.45.1              |              0           819 KB  esri
    sympy-1.12                 |          py39_0          5.3 MB  esri
    win_inet_pton-1.1.0        |          py39_1            9 KB  esri
    zeromq-4.3.5               |              0           243 KB  esri
    zlib-ng-2.1.6              |              0           366 KB  esri
    ---------------------------|-----------------
                                          Total:         23.6 MB

The following NEW packages will be INSTALLED:

  prompt-toolkit      esri/noarch::prompt-toolkit-3.0.42-py_0

The following packages will be UPDATED:
```

```
  cryptography                          41.0.3-py39_2 --> 42.0.4-py39_0
  json5                                 0.9.5-py_0 --> 0.9.14-py_0
  krb5                                  1.21.1-0 --> 1.21.2-1
  libpng                pkgs/main::libpng-1.6.39-h8cc25b3_0 --> esri::libpng-1.6.42-3
  libprotobuf                           3.21.12-0 --> 3.21.12-3
  libtiff                               4.5.1-0 --> 4.6.0-2
  matplotlib             3.6.3-py39_arcgispro_0 --> 3.6.3-py39_arcgispro_2
  oauthlib              esri/win-64::oauthlib-3.2.0-py39_0 --> esri/noarch::oauthlib-3.2.2-py_0
  openssl                               3.0.10-0 --> 3.0.13-0
  orc                                   1.8.3-0 --> 1.8.3-2
  pip                   pkgs/main::pip-23.3.1-py39haa95532_0 --> esri::pip-23.3.2-py39_0
  prompt_toolkit                        3.0.5-py_0 --> 3.0.42-0
  protobuf                              3.21.12-py39_0 --> 3.21.12-py39_1
  pybind11                              2.10.4-1 --> 2.10.4-2
  pygments                              2.14.0-py_0 --> 2.17.2-py_0
  pyopenssl             23.2.0-py39haa95532_0 --> 24.0.0-py39haa95532_0
  pytest                                7.2.0-py39_0 --> 7.4.3-py39_0
  pyzmq                                 25.0.2-py39_0 --> 25.0.2-py39_2
  setuptools                            67.7.2-py39_0 --> 68.2.2-py39_0
  sqlite                                3.41.2-0 --> 3.45.1-0
  sympy                                 1.9-py39_1 --> 1.12-py39_0
  win_inet_pton                         1.1.0-py39_0 --> 1.1.0-py39_1
  zeromq                                4.3.4-1 --> 4.3.5-0
  zlib-ng                               2.0.7-0 --> 2.1.6-0


Proceed ([y]/n)? y


Downloading and Extracting Packages
pytest-7.4.3         | 517 KB    | ############################################################
matplotlib-3.6.3     | 8 KB      | ############################################################
prompt-toolkit-3.0.4 | 263 KB    | ############################################################
zeromq-4.3.5         | 243 KB    | ############################################################
win_inet_pton-1.1.0  | 9 KB      | ############################################################
prompt_toolkit-3.0.4 | 5 KB      | ############################################################
sympy-1.12           | 5.3 MB    | ############################################################
protobuf-3.21.12     | 216 KB    | ############################################################
libtiff-4.6.0        | 857 KB    | ############################################################
pip-23.3.2           | 2.5 MB    | ############################################################
cryptography-42.0.4  | 4.2 MB    | ############################################################
libpng-1.6.42        | 335 KB    | ############################################################
pybind11-2.10.4      | 156 KB    | ############################################################
sqlite-3.45.1        | 819 KB    | ############################################################
orc-1.8.3            | 430 KB    | ############################################################
setuptools-68.2.2    | 1.2 MB    | ############################################################
krb5-1.21.2          | 687 KB    | ############################################################
pyopenssl-24.0.0     | 99 KB     | ############################################################
openssl-3.0.13       | 2.5 MB    | ############################################################
json5-0.9.14         | 20 KB     | ############################################################
zlib-ng-2.1.6        | 366 KB    | ############################################################
pygments-2.17.2      | 839 KB    | ############################################################
libprotobuf-3.21.12  | 1.8 MB    | ############################################################
pyzmq-25.0.2         | 390 KB    | ############################################################
oauthlib-3.2.2       | 94 KB     | ############################################################
Preparing transaction: done
Verifying transaction: done
Executing transaction: done
Retrieving notices: ...working... done
```

When the Python prompt appears again the installation is finished.

PART 3. Test the deep learning package installation

6. First, activate the python interface. Type command `python`

A printout of the python version will appear. When python prompt >>> appear,

7. Type the following

```
import fastai
```

```
import torch
```

```
import arcgis
```

These are the essential packages of deep learning package. Because these are heavy packages, it may take a moment to load. If no errors come up, it means our installation is successful. You can use `quit()` to quit the python interface.

```
(arcgispro_py3_dl)  C:\Users\Di\AppData\Local\ESRI\conda\envs\arcgispro_py3_dl>python
Python 3.9.18 [MSC v.1931 64 bit (AMD64)] :: Anaconda, Inc. on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> import fastai
>>> import torch
>>> import arcgis
>>> quit()

(arcgispro_py3_dl)  C:\Users\Di\AppData\Local\ESRI\conda\envs\arcgispro_py3_dl>
```

REFERENCE

https://support.esri.com/en-us/knowledge-base/how-to-clone-a-python-environment-with-the-python-comma-000020560

https://developers.arcgis.com/python/guide/deep-learning/

https://developers.arcgis.com/python/guide/test-install/