Topik : 1.3. Instalasi TFF

Objective : Setup lingkungan TFF di local / Colab

Task : Instal dan jalankan contoh TFF pertama

Source: https://www.tensorflow.org/federated/install

Instalasi TFF di Collab

1. Setelah beberapa percobaan : Ternyata TFF belum support Python 3.12 , TFF baru support 3.9-3.11

```
Requires-Python >=3.9,<3.12;
```

2. Karena Di Google Collab Secara Default sudah menggunakan Python 3.12 maka : Solusi nya kita harus menginstall Python versi terbaru yang mensuport TFF yaittu 3.11

```
!sudo apt update
!sudo apt install python3.11 python3.11-venv python3.11-dev -y
```

3. Kemudian , kita membuat virtual environment Python 3.11 bernama py311_env. Virtual environment ini terisolasi, jadi package yang diinstall tidak mengganggu Python Default sehingga kita bisa menjalankan program dengan menggunakan Python 3.11 tanpa ada gangguan dari Python Default 3.12

```
!python3.11 -m venv py311_env
```

4. Setelah itu, kita meng-upgrade pip di virtual environment py311_env untuk memastikan package modern tanpa error versi.

```
!py311_env/bin/pip install --upgrade pip
```

5. Kemudian, kita melakukan penginstallan package triton di virtual environment py311_env yang akan digunakan untuk mempercepat komputasi GPU dan untuk dipakai JAX yang ada di triton untuk menjadi backend TFF.

```
!py311_env/bin/pip install triton
```

6. Setelah itu, kita akan melakukan penginstallan Tensorflow Federated itu sendiri

```
!py311_env/bin/pip install tensorflow-federated
```

7. Melakukan verifikasi TFF dengan melakukan pengecekan apakah TFF sudah terinstall atau belum

```
!py311_env/bin/python -c "import tensorflow_federated as tff; print(tff.__version__)"
```

8. Mencoba menjalankan TFF Sederhana

```
# Buat script hello_tff.py
with open("hello_tff.py", "w") as f:
    f.write("""
import tensorflow_federated as tff

# Cek versi TFF
print('TFF version:', tff.__version__)

# Buat federated computation sederhana
hello = tff.federated_computation(lambda: 'Hello World')

# Jalankan computation
print(hello())
""")
```

Instalasi TFF di Local

1. Karena kita menggunakan windows, maka kita harus mendownload WSL/UBUNTU terlebih dahulu



- 2. Pastikan terminal VS Code sudah menggunakan WSL/Ubuntu atau Git Bash/PowerShell (lebih bagus WSL).
- 3. Ikuti step power shell untuk menggunakan WSL di vs code

- 2. Pilih Jenis Terminal
- 1. Klik tanda panah kecil (▼) di pojok kanan terminal.
- 2. Pilih Select Default Profile
- 3. Di situ kamu akan lihat beberapa pilihan (tergantung apa yang sudah terinstall di Windows):
 - Command Prompt (cmd)
 - PowerShell
 - Git Bash (kalau kamu sudah install Git for Windows)
 - WSL (kalau kamu sudah install Windows Subsystem for Linux)
- 4. Cek Versi Python

```
python3 --version
```

5. Saat ini TFF versi terbaru sudah support Python 3.11, tapi **belum support penuh Python 3.12**. Jadi yang paling aman adalah install Python 3.11 di WSL dan pakai TFF terbaru.

```
sudo apt update
sudo apt install python3.11 python3.11-venv python3.11-dev -y
```

6. buat environment pakai Python 3.11

```
python3.11 -m venv venv
source venv/bin/activate
```

7. install versi terbaru TFF

```
pip install --upgrade pip
pip install --upgrade tensorflow-federated
```

8. buat file untuk memverifikasi TFF



9. Coba run (run tetap di wsl)

```
version.py

202-08-25 00:44:44.782879: I tensorflow/tsl/cuda/cudart_stub.cc:28] Could not find cuda drivers on your machine, GPU will not be used.

202-08-25 00:44:44.782879: I tensorflow/compiler/xla/stream_executor/cuda/cuda_dnn.cc:934Z] Unable to register cuRNN factory: Attempting to register factory for plugin cuDNN when one has already been registered

202-08-25 00:44:44.4940781: E tensorflow/compiler/xla/stream_executor/cuda/cuda_fft.cc:609] Unable to register cuRNN factory: Attempting to register factory for plugin cuFT when one has already been registered

202-08-25 00:44:44.940977: E tensorflow/compiler/xla/stream_executor/cuda/cuda_blas.cc:1518] Unable to register cuRNN factory: Attempting to register factory for plugin cuERAs when one has already been registered

202-08-08-25 00:44:45.031759: I tensorflow/tosl/cuda/cudart_stub.cc:28] Could not find cuda drivers on your machine, GPU will not be used.

202-08-25 00:44:55.031759: I tensorflow/core/platform/cpu feature_gnard.cc:182] This Tensorflow binary is optimized to use available CPU instructions in performance-critical operations.

To enable the following instructions: AVX2 FPM, in other operations, rebuild Tensorflow with the appropriate compiler flags.

202-08-25 00:44:57.40418: W tensorflow/compiler/ti2tensorrt/utils/youtls.cc:38] T-TRT Warming: Could not find TensorRT

TFF version: 0.87.0

(verw) erranshaumy@CESCTOP-80038NM:/mtr/c/vp/MATERI/DNSTAL TFFS python version.py
202-08-25 00:44:59.415509: I tensorflow/could coldert stub.cc:28] Could not find cuda drivers on your machine, GPU will not be used.
```

Output:

```
Z025-08-25 00:46:23.679585: w tensorTlow/compller/ttztensorTt/utl1s/py_utl1s.cc
TFF version: 0.87.0

(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/INSTAL TFF$
```

PERCOBAAN TFF PERTAMA: TFF HELLO WORLD

Output:

```
Skipping registering GPU devices...
b'Hello World from TFF'
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/INSTAL TFF$
```

PERCOBAAN TFF KEDUA:

Source: https://www.tensorflow.org/federated/tutorials/simulations with accelerators