Topik   : 4.5. Laporan & Video Demo

Objective   : Buat ringkasan laporan, struktur folder Git, video demo 5 menit

Task   : Kirim via GitHub + screencast tools

INSTALASI

Link Video : https://youtu.be/yB5ajggGhv8?si=Lo5bKkfpQFvVV0tO

1. Masuk ke dalam WSL

```
PS C:\KP\MATERI\4.5. Laporan & Video Demo> wsl
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.6.87.2-microsoft-standard-WSL2 x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

 System information as of Sun Sep 14 21:43:04 WIB 2025

  System load:  0.56              Processes:             63
  Usage of /:   2.3% of 1006.85GB  Users logged in:       0
  Memory usage: 11%               IPv4 address for eth0: 172.24.152.174
  Swap usage:   0%

  just raised the bar for easy, resilient and secure K8s cluster deployment.

  https://ubuntu.com/engage/secure-kubernetes-at-the-edge

This message is shown once a day. To disable it please create the
/home/ezranahumury/.hushlogin file.
```

2. Update Repository Index

```
This message is shown once a day. To disable it please create the
/home/ezranahumury/.hushlogin file.
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ sudo apt update
[sudo] password for ezranahumury:
Get:1 https://storage.googleapis.com/bazel-apt stable InRelease [2265 B]
Get:2 https://storage.googleapis.com/bazel-apt stable/jdk1.8 amd64 Packages [17.1 kB]
Get:3 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Hit:4 http://archive.ubuntu.com/ubuntu noble InRelease
Get:5 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
```

3. Melakukan pengecekan version python

```
Reading state information... Done
11 packages can be upgraded. Run 'apt list --upgradable' to see them.
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ python3 --version
Python 3.12.3
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ sudo apt install python3.11 python3.11-venv pyt
```

4. Installing required packages

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ sudo apt install python3.11 python3.11-venv python3.11-dev -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
python3.11 is already the newest version (3.11.13-1+noble1).
python3.11-venv is already the newest version (3.11.13-1+noble1).
```

5. Virtual environment creation step

```
Use `sudo apt autoremove` to remove them.
0 upgraded, 0 newly installed, 0 to remove and 9 not upgraded.
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ python3.11 -m venv venv
```

6. Activation step

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ source venv/bin/activate
```

7. Package manager upgrade step

```
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ pip install --upgrade pip
Requirement already satisfied: pip in ./venv/lib/python3.11/site-packages (24.0)
Collecting pip
  Using cached pip-25.2-py3-none-any.whl.metadata (4.7 kB)
Using cached pip-25.2-py3-none-any.whl (1.8 MB)
Installing collected packages: pip
  Attempting uninstall: pip
    Found existing installation: pip 24.0
    Uninstalling pip-24.0:
      Successfully uninstalled pip-24.0
Successfully installed pip-25.2
```

8. Installasi library tensorflow federated

```
Successfully installed pip-25.2
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ pip install --upgrade tensorflow-federated
Collecting tensorflow-federated
  Using cached tensorflow_federated-0.87.0-py3-none-manylinux_2_31_x86_64.whl.metadata (19 kB)
Collecting absl-py==1.*,>=1.0 (from tensorflow-federated)
  Using cached absl_py-1.4.0-py3-none-any.whl.metadata (2.3 kB)
Collecting attrs~=23.1 (from tensorflow-federated)
  Using cached attrs-23.2.0-py3-none-any.whl.metadata (9.5 kB)
Collecting cachetools~=5.3 (from tensorflow-federated)
  Using cached cachetools-5.5.2-py3-none-any.whl.metadata (5.4 kB)
Collecting dm-tree==0.1.8 (from tensorflow-federated)
  Using cached dm_tree-0.1.8-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (1.9 kB)
Collecting dp-accounting==0.4.3 (from tensorflow-federated)
  Using cached dp_accounting-0.4.3-py3-none-any.whl.metadata (1.8 kB)
Collecting google-vizier==0.1.11 (from tensorflow-federated)
  Using cached google_vizier-0.1.11-py3-none-any.whl.metadata (10 kB)
Collecting grpcio~=1.46 (from tensorflow-federated)
  Using cached grpcio-1.74.0-cp311-cp311-manylinux2014_x86_64.whl.metadata (3.8 kB)
```

9. Installasi library pandas

```
1-0.45.1 wrapt-1.14.2
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ pip install pandas
Collecting pandas
  Using cached pandas-2.3.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (91 kB)
Requirement already satisfied: numpy>=1.23.2 in ./venv/lib/python3.11/site-packages (from pandas) (1.25.2)
Collecting python-dateutil>=2.8.2 (from pandas)
  Using cached python_dateutil-2.9.0.post0-py2.py3-none-any.whl.metadata (8.4 kB)
Collecting pytz>=2020.1 (from pandas)
  Using cached pytz-2025.2-py2.py3-none-any.whl.metadata (22 kB)
Collecting tzdata>=2022.7 (from pandas)
  Using cached tzdata-2025.2-py2.py3-none-any.whl.metadata (1.4 kB)
Requirement already satisfied: six>=1.5 in ./venv/lib/python3.11/site-packages (from python-dateutil>=2.8.2->pandas) (1.17.0)
Using cached pandas-2.3.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (12.4 MB)
Using cached python_dateutil-2.9.0.post0-py2.py3-none-any.whl (229 kB)
Using cached pytz-2025.2-py2.py3-none-any.whl (509 kB)
Using cached tzdata-2025.2-py2.py3-none-any.whl (347 kB)
Installing collected packages: pytz, tzdata, python-dateutil, pandas
Successfully installed pandas-2.3.2 python-dateutil-2.9.0.post0 pytz-2025.2 tzdata-2025.2
```

10. Installasi library matplotlib

```
Successfully installed pandas-2.3.2 python-dateutil-2.9.0.post0 pytz-2025.2 tzdata-2025.2
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ pip install matplotlib
Collecting matplotlib
  Using cached matplotlib-3.10.6-cp311-cp311-manylinux2014_x86_64.manylinux_2_17_x86_64.whl.metadata (11 kB)
Collecting contourpy>=1.0.1 (from matplotlib)
  Using cached contourpy-1.3.3-cp311-cp311-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl.metadata (5.5 kB)
Collecting cycler>=0.10 (from matplotlib)
  Using cached cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
Collecting fonttools>=4.22.0 (from matplotlib)
  Using cached fonttools-4.59.2-cp311-cp311-manylinux2014_x86_64.manylinux_2_17_x86_64.whl.metadata (109 kB)
Collecting kiwisolver>=1.3.1 (from matplotlib)
  Using cached kiwisolver-1.4.9-cp311-cp311-manylinux2014_x86_64.manylinux_2_17_x86_64.whl.metadata (6.3 kB)
Requirement already satisfied: numpy>=1.23 in ./venv/lib/python3.11/site-packages (from matplotlib) (1.25.2)
Requirement already satisfied: packaging>=20.0 in ./venv/lib/python3.11/site-packages (from matplotlib) (22.0)
Collecting pillow>=8 (from matplotlib)
  Using cached pillow-11.3.0-cp311-cp311-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl.metadata (9.0 kB)
Collecting pyparsing>=2.3.1 (from matplotlib)
  Downloading pyparsing-3.2.4-py3-none-any.whl.metadata (5.0 kB)
Requirement already satisfied: python-dateutil>=2.7 in ./venv/lib/python3.11/site-packages (from matplotlib) (2.9.0.post0)
Requirement already satisfied: six>=1.5 in ./venv/lib/python3.11/site-packages (from python-dateutil>=2.7->matplotlib) (1.17.0)
Using cached matplotlib-3.10.6-cp311-cp311-manylinux2014_x86_64.manylinux_2_17_x86_64.whl (8.7 MB)
Using cached contourpy-1.3.3-cp311-cp311-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl (355 kB)
Using cached cycler-0.12.1-py3-none-any.whl (8.3 kB)
Using cached fonttools-4.59.2-cp311-cp311-manylinux2014_x86_64.manylinux_2_17_x86_64.whl (5.0 MB)
Using cached kiwisolver-1.4.9-cp311-cp311-manylinux2014_x86_64.manylinux_2_17_x86_64.whl (1.4 MB)
Using cached pillow-11.3.0-cp311-cp311-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl (6.6 MB)
Downloading pyparsing-3.2.4-py3-none-any.whl (113 kB)
Installing collected packages: pyparsing, pillow, kiwisolver, fonttools, cycler, contourpy, matplotlib
Successfully installed contourpy-1.3.3 cycler-0.12.1 fonttools-4.59.2 kiwisolver-1.4.9 matplotlib-3.10.6 pillow-11.3.0 pyparsing-3.2.4
```

11. Installasi library seaborn

```
Successfully installed contourpy-1.3.3 cycler-0.12.1 fonttools-4.59.2 kiwisolver-1.4.9 matplotlib-3.10.6 pillow-11.3.0 pyparsing-3.2.4
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ pip install seaborn
Collecting seaborn
  Using cached seaborn-0.13.2-py3-none-any.whl.metadata (5.4 kB)
Requirement already satisfied: numpy!=1.24.0,>=1.20 in ./venv/lib/python3.11/site-packages (from seaborn) (1.25.2)
Requirement already satisfied: pandas>=1.2 in ./venv/lib/python3.11/site-packages (from seaborn) (2.3.2)
Requirement already satisfied: matplotlib!=3.6.1,>=3.4 in ./venv/lib/python3.11/site-packages (from seaborn) (3.10.6)
Requirement already satisfied: contourpy>=1.0.1 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (1.3.3)
Requirement already satisfied: cycler>=0.10 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (4.59.2)
Requirement already satisfied: kiwisolver>=1.3.1 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (1.4.9)
Requirement already satisfied: packaging>=20.0 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (22.0)
Requirement already satisfied: pillow>=8 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (11.3.0)
Requirement already satisfied: pyparsing>=2.3.1 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (3.2.4)
Requirement already satisfied: python-dateutil>=2.7 in ./venv/lib/python3.11/site-packages (from matplotlib!=3.6.1,>=3.4->seaborn) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in ./venv/lib/python3.11/site-packages (from pandas>=1.2->seaborn) (2025.2)
Requirement already satisfied: tzdata>=2022.7 in ./venv/lib/python3.11/site-packages (from pandas>=1.2->seaborn) (2025.2)
Requirement already satisfied: six>=1.5 in ./venv/lib/python3.11/site-packages (from python-dateutil>=2.7->matplotlib!=3.6.1,>=3.4->seaborn) (1.17.0)
Using cached seaborn-0.13.2-py3-none-any.whl (294 kB)
Installing collected packages: seaborn
Successfully installed seaborn-0.13.2
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$
```

Link Video : https://youtu.be/TISMq0y39nM

MENJALANKAN PROGRAM

1. Masuk ke WSL

```
logout
PS C:\KP\MATERI\4.5. Laporan & Video Demo> wsl
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$
```

2. Aktivkan environment

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ source venv/bin/activate
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$
```

PILIH SALAH SATU : Execution Step

- Menjalankan code manual averaging

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ source venv/bin/activate
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ python Manual_Averaging.py
```

- Menjalankan code TFF

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ source venv/bin/activate
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ python TFF.py
```

3. Keluar dari environment

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ source venv/bin/activate
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ deactivate
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$
```

4. Keluar dari WSL

```
ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ exit
logout
PS C:\KP\MATERI\4.5. Laporan & Video Demo>
```

Link Video : https://youtu.be/Y_skRxiuigU?si=-m2BDpA6mcs-Fa66

PEMBAHASAN :

```
already been registered
TensorFlow: 2.14.1
TFF: 0.87.0
2025-09-16 15:55:09.818706: E tensorflow/core/grappler/grappler_item_builder.cc:435] Failed to detect the fetch node(s), skipping this input
[nm=0.010] Round 01 | train_acc=0.7898 | train_loss=0.4789
[nm=0.010] Round 02 | train_acc=0.8200 | train_loss=0.3784
[nm=0.010] Round 03 | train_acc=0.9198 | train_loss=0.1874
[nm=0.010] Round 04 | train_acc=0.9322 | train_loss=0.1713
[nm=0.010] Round 05 | train_acc=0.9576 | train_loss=0.0993
2025-09-16 15:55:04.263774: E tensorflow/core/grappler/grappler_item_builder.cc:435] Failed to detect the fetch node(s), skipping this input
[nm=0.050] Round 01 | train_acc=0.7473 | train_loss=0.4961
[nm=0.050] Round 02 | train_acc=0.7920 | train_loss=0.4169
[nm=0.050] Round 03 | train_acc=0.8831 | train_loss=0.2533
[nm=0.050] Round 04 | train_acc=0.9267 | train_loss=0.1926
[nm=0.050] Round 05 | train_acc=0.9560 | train_loss=0.0956
2025-09-16 15:55:07.303245: E tensorflow/core/grappler/grappler_item_builder.cc:435] Failed to detect the fetch node(s), skipping this input
[nm=0.100] Round 01 | train_acc=0.8091 | train_loss=0.4673
[nm=0.100] Round 02 | train_acc=0.8322 | train_loss=0.3708
[nm=0.100] Round 03 | train_acc=0.9013 | train_loss=0.2124
[nm=0.100] Round 04 | train_acc=0.9304 | train_loss=0.2011
[nm=0.100] Round 05 | train_acc=0.9458 | train_loss=0.1741
2025-09-16 15:55:09.809753: E tensorflow/core/grappler/grappler_item_builder.cc:435] Failed to detect the fetch node(s), skipping this input
[nm=0.500] Round 01 | train_acc=0.7942 | train_loss=0.4655
[nm=0.500] Round 02 | train_acc=0.8931 | train_loss=0.2924
[nm=0.500] Round 03 | train_acc=0.8680 | train_loss=1.3909
[nm=0.500] Round 04 | train_acc=0.7524 | train_loss=3.7565
[nm=0.500] Round 05 | train_acc=0.7513 | train_loss=3.8122
2025-09-16 15:55:12.404613: E tensorflow/core/grappler/grappler_item_builder.cc:435] Failed to detect the fetch node(s), skipping this input
[nm=1.000] Round 01 | train_acc=0.7736 | train_loss=0.4656
[nm=1.000] Round 02 | train_acc=0.7782 | train_loss=3.2399
[nm=1.000] Round 03 | train_acc=0.7744 | train_loss=3.4209
[nm=1.000] Round 04 | train_acc=0.7449 | train_loss=3.9117
[nm=1.000] Round 05 | train_acc=0.7582 | train_loss=3.7085

=== Rata-rata Akurasi per NoiseMultiplier ===
   NoiseMultiplier  train_binary_accuracy
0            0.01               0.883867
1            0.05               0.861022
2            0.10               0.883778
3            0.50               0.811822
4            1.00               0.765867
Grafik disimpan: tff_serverdp_accuracy.png
(venv) ezranahumury@DESKTOP-8003BIM:/mnt/c/KP/MATERI/4.5. Laporan & Video Demo$ []
```


Federated Learning (TFF 0.87.0 + Server DP Aggregator)