Membuat File Aplikasi Precise Engine untuk Mycroft Precise pada Ubuntu 16.04 LTS

Note : Metode pemasangan berlaku umum sehingga dapat diterapkan pada OS Ubuntu berbagai arsitektur termasuk Ubuntu Arm dan Ubuntu Aarch64

1. Pasang paket dependency untuk menjalankan Virtual Environment Python:

```
$ sudo apt-get install python3-dev python3-venv
```

2. Buat folder khusus untuk mengumpulkan semua file aplikasi (opsional):

```
$ mkdir qcom_emulator
$ cd qcom_emulator
```

3. Jalankan Virtual Environment Python:

```
$ python3.5 -m venv env
$ source env/bin/activate
```

```
isro@isro-vmware:~/qcom_emulator$ python3.5 -m venv env
isro@isro-vmware:~/qcom_emulator$ ls
env
isro@isro-vmware:~/qcom_emulator$ source env/bin/activate
(env) isro@isro-vmware:~/qcom_emulator$ ls
env
```

Perhatikan bahwa Python yang digunakan adalah Python bawaan Ubuntu 16.04 LTS, yaitu versi 3.5. Sesuaikan perintah apabila versi python yang digunakan tidak sama.

4. Unduh source code Mycroft Precise:

```
$ git clone https://github.com/zero15120/mycroft-precise-engine-lite
$ cd mycroft-precise-engine-lite
```

```
(env) isro@isro-vmware:~/qcom_emulator$ cd mycroft-precise-engine-lite
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls
build.sh  model    precise.template.spec  requirements.txt  setup.py
LICENSE   precise  README.md              runner            setup.sh
```

5. Perbarui paket library Python:

```
$ pip install --upgrade pip setuptools wheel
```

```
Installing collected packages: pip, setuptools, wheel
  Found existing installation: pip 8.1.1
    Uninstalling pip-8.1.1:
      Successfully uninstalled pip-8.1.1
  Found existing installation: setuptools 20.7.0
    Uninstalling setuptools-20.7.0:
      Successfully uninstalled setuptools-20.7.0
Successfully installed pip-20.3.3 setuptools-51.0.0 wheel-0.36.2
```

6. Unduh paket library Python tflite_runtime dalam format wheel:

```
$ wget https://github.com/google-coral/pycoral/releases/download/release-frogfish/tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl
```

```
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls
build.sh                requirements.txt
LICENSE                 runner
model                   setup.py
precise                 setup.sh
precise.template.spec   tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl
README.md
```

Kunjungi https://www.tensorflow.org/lite/guide/python untuk mendapatkan link unduhan paket library versi terbaru. Unduhlah sesuai dengan versi Python dan arsitektur sistem seperti gunakan Linux (ARM 32) untuk Ubuntu Arm dan Linux (ARM 64) untuk Ubuntu Aarch64.

7. Unpack wheel paket library Python tflite_runtime:

```
$ wheel unpack tflite_runtime-*-cp35-cp35m-*.whl
```

```
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ wheel unpack
 tflite_runtime-*-cp35-cp35m-*.whl
Unpacking to: ./tflite_runtime-2.5.0...OK
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls
build.sh                requirements.txt
LICENSE                 runner
model                   setup.py
precise                 setup.sh
precise.template.spec   tflite_runtime-2.5.0
README.md               tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl
```

Perhatikan bahwa tflite_runtime-2.5.0 adalah folder hasil unpack wheel.

8. Modifikasi file interpreter pada paket library Python tflite_runtime (file ini perlu diubah untuk menghindari penggunaan paket library Python tensorflow versi penuh):

```
$ nano tflite_runtime-2.5.0/tflite_runtime-2.5.0.data/purelib/tflite_runtime/interpreter.py
```

Sebelum :

```
"""Python TF-Lite interpreter."""
from __future__ import absolute_import
from __future__ import division
from __future__ import print_function

import ctypes
import platform
import sys
import os

import numpy as np

# pylint: disable=g-import-not-at-top
if not os.path.splitext(__file__)[0].endswith(
    os.path.join('tflite_runtime', 'interpreter')):
  # This file is part of tensorflow package.
  from tensorflow.lite.python.interpreter_wrapper import _pywrap_tensorflow_interpreter_wrapper as _interpreter_wrapper
  from tensorflow.python.util.tf_export import tf_export as _tf_export
else:
  # This file is part of tflite_runtime package.
  from tflite_runtime import _pywrap_tensorflow_interpreter_wrapper as _interpreter_wrapper

  def _tf_export(*x, **kwargs):
    del x, kwargs
    return lambda x: x
```

Sesudah :

```
"""Python TF-Lite interpreter."""
from __future__ import absolute_import
from __future__ import division
from __future__ import print_function

import ctypes
import platform
import sys
import os

import numpy as np

# pylint: disable=g-import-not-at-top
# This file is part of tflite_runtime package.
from tflite_runtime import _pywrap_tensorflow_interpreter_wrapper as _interpreter_wrapper

def _tf_export(*x, **kwargs):
  del x, kwargs
  return lambda x: x
```

Perhatikan bahwa letak file ini pada tflite_runtime-2.5.0/tflite_runtime-2.5.0.data/purelib/tflite_runtime/interpreter.py mungkin berbeda, jadi cek terlebih dahulu sebelum menjalankan perintah.

9. Repack wheel paket library python tflite_runtime:

```
$ wheel pack tflite_runtime-2.5.0
```

```
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ wheel pack t
flite_runtime-2.5.0
Repacking wheel as ./tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl...OK
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls
build.sh                requirements.txt
LICENSE                 runner
model                   setup.py
precise                 setup.sh
precise.template.spec   tflite_runtime-2.5.0
README.md               tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl
```

Perhatikan bahwa parameter tflite_runtime-2.5.0 adalah folder hasil unpack wheel, jadi sesuaikan jika berbeda.

10. Ubah permission eksekusi file build.sh:

```
$ sudo chmod a+x build.sh
```

```
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ sudo chmod a
+x build.sh
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls
build.sh                requirements.txt
LICENSE                 runner
model                   setup.py
precise                 setup.sh
precise.template.spec   tflite_runtime-2.5.0
README.md               tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl
```

11. Ubah permission eksekusi file setup.sh:

```
$ sudo chmod a+x setup.sh
```

```
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ sudo chmod a
+x setup.sh
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls
build.sh                requirements.txt
LICENSE                 runner
model                   setup.py
precise                 setup.sh
precise.template.spec   tflite_runtime-2.5.0
README.md               tflite_runtime-2.5.0-cp35-cp35m-linux_x86_64.whl
```

12. Build aplikasi Precise Engine:

```
$ ./build.sh
```

```
(env) isro@isro-vmware:~/qcom_emulator/mycroft-precise-engine-lite$ ls dist/precise-engine/
base_library.zip
_bz2.cpython-35m-x86_64-linux-gnu.so
_codecs_cn.cpython-35m-x86_64-linux-gnu.so
_codecs_hk.cpython-35m-x86_64-linux-gnu.so
_codecs_iso2022.cpython-35m-x86_64-linux-gnu.so
_codecs_jp.cpython-35m-x86_64-linux-gnu.so
_codecs_kr.cpython-35m-x86_64-linux-gnu.so
_codecs_tw.cpython-35m-x86_64-linux-gnu.so
_ctypes.cpython-35m-x86_64-linux-gnu.so
_curses.cpython-35m-x86_64-linux-gnu.so
_decimal.cpython-35m-x86_64-linux-gnu.so
_hashlib.cpython-35m-x86_64-linux-gnu.so
include
```

Perhatikan bahwa hasil build tersimpan pada folder precise-engine di dalam folder dist. Salin satu folder precise-engine secara utuh untuk dapat menjalankan aplikasi precise-engine di dalam folder tersebut.