머신러닝 파이프라인

쿠베플로우 파이프라인 Part 3

송호연

목차

쿠베플로우 파이프라인 Part 3

학습목표

쿠베플로우 파이프라인 Part 3

01. 쿠베플로우 실습을 통해 작동 방식을 이해한다.

실습을 진행하면서 쿠베플로우 파이프라인의 기본 사용법에 대해 공부한다.

실습

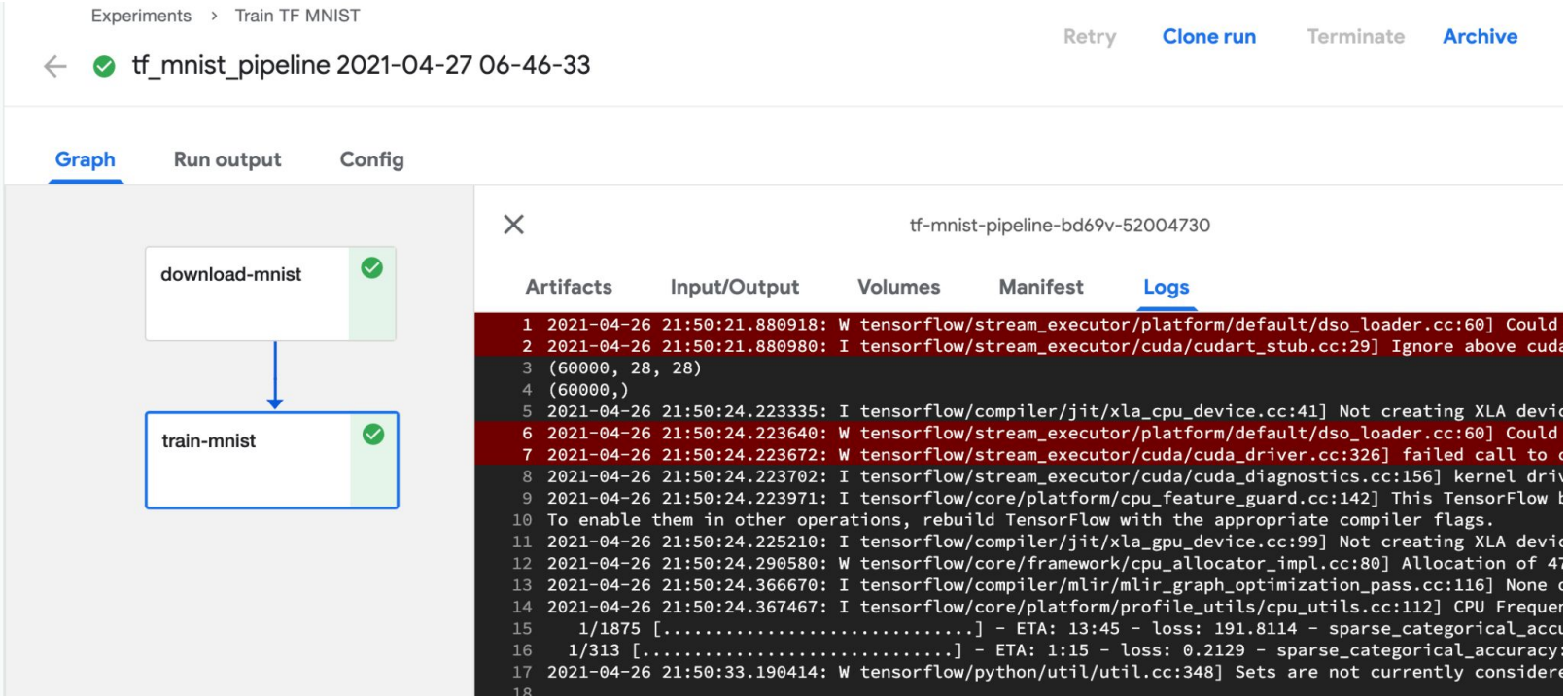
Tensorflow MNIST

CatBoost

실습 1

Tensorflow MNIST

https://github.com/chris-chris/kubeflow-tutorial/tree/master/lesson10_tf_mnist



실습 1

Tensorflow MNIST

```
import kfp
from kfp.components import func_to_container_op, OutputPath, InputPath

EXPERIMENT_NAME = 'Train TF MNIST'       # Name of the experiment in the UI
KUBEFLOW_HOST = "http://127.0.0.1:8080/pipeline"


def download_mnist(output_dir_path: OutputPath()):
    import tensorflow as tf

    tf.keras.datasets.mnist.load_data(output_dir_path)
```

실습 1

Tensorflow MNIST

```
def train_mnist(data_path: InputPath(), model_output: OutputPath()):
    import tensorflow as tf
    import numpy as np
    with np.load(data_path, allow_pickle=True) as f:
        x_train, y_train = f['x_train'], f['y_train']
        x_test, y_test = f['x_test'], f['y_test']

    model = tf.keras.models.Sequential([
        tf.keras.layers.Flatten(input_shape=(28, 28)),
        tf.keras.layers.Dense(128, activation='relu'),
        tf.keras.layers.Dense(10)
    ])
    model.compile(
        optimizer=tf.keras.optimizers.Adam(0.001),
        loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
        metrics=[tf.keras.metrics.SparseCategoricalAccuracy()],
    )
    model.fit(x_train, y_train)
    model.evaluate(x_test, y_test)
    model.save(model_output)
```

실습 1

Tensorflow MNIST

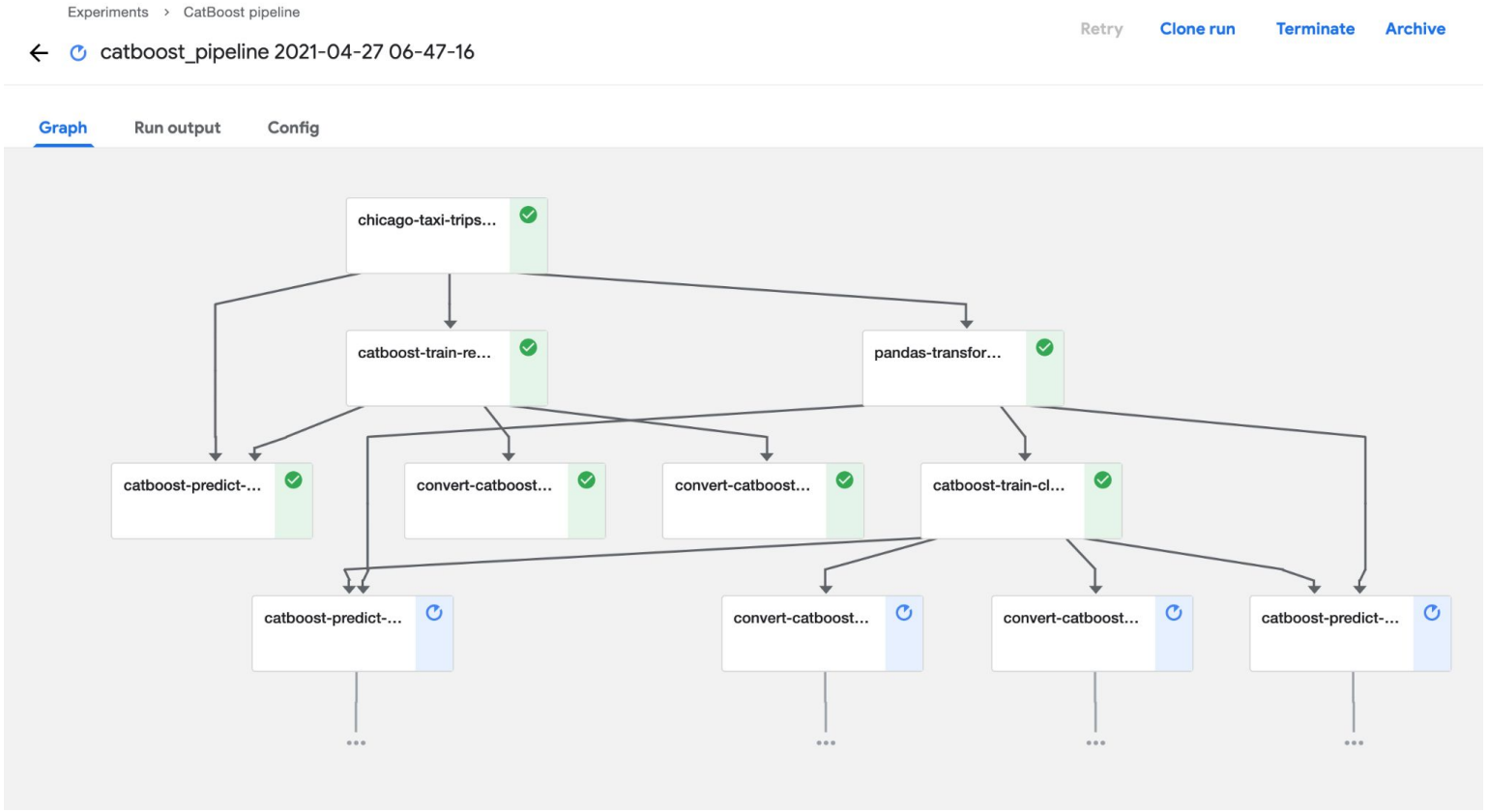
```
def tf_mnist_pipeline():
    download_op = func_to_container_op(download_mnist, base_image="tensorflow/tensorflow")
    train_mnist_op = func_to_container_op(train_mnist, base_image="tensorflow/tensorflow")
    train_mnist_op(download_op().output)


if __name__ == '__main__':
    import kfp.compiler as compiler
    compiler.Compiler().compile(tf_mnist_pipeline, __file__ + '.zip')
    kfp.Client(host=KUBEFLOW_HOST).create_run_from_pipeline_func(
        tf_mnist_pipeline,
        arguments={},
        experiment_name=EXPERIMENT_NAME)
```

실습 1

CatBoost

https://github.com/chris-chris/kubeflow-tutorial/tree/master/lesson11_catboost



실습 1

CatBoost

```
import kfp
from kfp import components

EXPERIMENT_NAME = 'CatBoost pipeline'       # Name of the experiment in the UI
KUBEFLOW_HOST = "http://127.0.0.1:8080/pipeline"

chicago_taxi_dataset_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/e3337b8bdcd63636934954e592d4b32c95b49129/components/datasets/Chicago%20Taxi/component.yaml')
pandas_transform_csv_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/e69a6694/components/pandas/Transform_DataFrame/in_CSV_format/component.yaml')
```

실습 1

CatBoost

```
catboost_train_classifier_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/Train_classifier/from_CSV/component.yaml')
catboost_train_regression_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/Train_regression/from_CSV/component.yaml')
catboost_predict_classes_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/Predict_classes/from_CSV/component.yaml')
catboost_predict_values_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/Predict_values/from_CSV/component.yaml')
catboost_predict_class_probabilities_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/Predict_class_probabilities/from_CSV/component.yaml')
catboost_to_apple_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/convert_CatBoostModel_to_AppleCoreMLModel/component.yaml')
catboost_to_onnx_op =
components.load_component_from_url('https://raw.githubusercontent.com/kubeflow/pipelines/f97ad2/components/CatBoost/convert_CatBoostModel_to_ONNX/component.yaml')
```

실습 1

CatBoost

```
def catboost_pipeline():
    training_data_in_csv = chicago_taxi_dataset_op(
        where='trip_start_timestamp >= "2019-01-01" AND trip_start_timestamp < "2019-02-01"',
        select='tips,trip_seconds,trip_miles,pickup_community_area,dropoff_community_area,fare,tolls,extras,trip_total',
        limit=10000,
    ).output

    training_data_for_classification_in_csv = pandas_transform_csv_op(
        table=training_data_in_csv,
        transform_code="df.insert(0, "was_tipped", df["tips"] > 0); del df["tips"]",
    ).output

    catboost_train_regression_task = catboost_train_regression_op(
        training_data=training_data_in_csv,
        loss_function='RMSE',
        label_column=0,
        num_iterations=200,
    )
```

실습 1

CatBoost

```
regression_model = catboost_train_regression_task.outputs['model']

catboost_train_classifier_task = catboost_train_classifier_op(
    training_data=training_data_for_classification_in_csv,
    label_column=0,
    num_iterations=200,
)

classification_model = catboost_train_classifier_task.outputs['model']

evaluation_data_for_regression_in_csv = training_data_in_csv
evaluation_data_for_classification_in_csv = training_data_for_classification_in_csv

catboost_predict_values_op(
    data=evaluation_data_for_regression_in_csv,
    model=regression_model,
    label_column=0,
)
```

실습 1

CatBoost

```
catboost_predict_classes_op(
    data=evaluation_data_for_classification_in_csv,
    model=classification_model,
    label_column=0,
)

catboost_predict_class_probabilities_op(
    data=evaluation_data_for_classification_in_csv,
    model=classification_model,
    label_column=0,
)

catboost_to_apple_op(regression_model)
catboost_to_apple_op(classification_model)

catboost_to_onnx_op(regression_model)
catboost_to_onnx_op(classification_model)
```

실습 1

CatBoost

```
if __name__ == '__main__':
    kfp.compiler.Compiler().compile(catboost_pipeline, __file__ + '.zip')
    kfp.Client(host=KUBEFLOW_HOST).create_run_from_pipeline_func(
        catboost_pipeline,
        arguments={},
        experiment_name=EXPERIMENT_NAME)
```

짚어보기

쿠베플로우 파이프라인 Part 3

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감사합니다.

THANKS FOR WATCHING