

Quickstart

Setup

Get up and running with Actions! In this quickstart you will learn the basics to get up and running with Actions and Giza Platform. You will create a Giza Workspace, initialize your first Action, generate a deployment and create executions with Actions Runs

Before you begin, make sure you have all the necessary libraries installed:

Copy pipinstallgiza-actions pipxinstallgiza-cli

From your terminal, create a Giza user through our CLI in order to access the Giza Platform:

Copy gizauserscreate

After creating your user, log into Giza:

Copy gizauserslogin

Optional : you can create an API Key for your user in order to not regenerate your access token every few hours.

Copy gizauserscreate-api-key

To create Actions Runs you will need a Giza Workspace, create it executing the following command in your terminal:

Copy gizaworkspacescreate

Create your first Action

You can use our Giza CLI to initialize an Action project:

Copy gizaactionsnew

After submitting the required parameters you will get a directory with the following structure:

Copy gizaactionsnewmnist_example cdexample tree

```
. |—— README.md |—— mnist_example | |—— init.py | |—— predict_cairo_action.py
| |—— predict_onnx_action.py | |—— train_action.py | |—— utils.py |—— pyproject.toml
|—— tests | |—— init.py |—— zero.jpg
```

This structure represents a ready-to-use Python project to work with Giza Actions based on [MNIST Tutorial](#) .

An example of how to define an action can be found in `mnist_example/train_action.py` . This script is responsible for creating your [Action](#) (workflow) for training your neural network and deploying the action on your Giza [Workspace](#) .

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mnist_example/train_action.py

```
import numpy as np
import torch
import torch.nn as nn
import torch.nn.functional as F
import torch.optim as optim
import torchvision
from giza_actions.action import Action, action
from giza_actions.task import task
from scipy.ndimage import zoom
from torch.utils.data import DataLoader, TensorDataset
```

```
device = torch.device("cuda" if torch.cuda.is_available() else "cpu")
```

Neural Network Definition

```
input_size=196 # 14x14
hidden_size=10
num_classes=10
num_epochs=10
batch_size=256
learning_rate=0.001
```

```
class NeuralNet(nn.Module):
    def __init__(self, input_size, hidden_size, num_classes):
        super(NeuralNet, self).__init__()
        self.input_size = input_size
        self.l1 = nn.Linear(input_size, hidden_size)
        self.relu = nn.ReLU()
        self.l2 = nn.Linear(hidden_size, num_classes)
```

```
    def forward(self, x):
        out = self.l1(x)
        out = self.relu(out)
        out = self.l2(out)
        return out
```

Task Definitions

```
def resize_images(images):
    return np.array([zoom(image[0], (0.5, 0.5)) for image in images])
```

```
@task(name="Prepare Datasets")
def prepare_datasets():
    print("Prepare dataset...")
    train_dataset = torchvision.datasets.MNIST(root="./data", train=True, download=True)
    test_dataset = torchvision.datasets.MNIST(root="./data", train=False)
```

```
    x_train = resize_images(train_dataset)
    x_test = resize_images(test_dataset)
```

```
    x_train = torch.tensor(x_train.reshape(-1, 14*14).astype("float32")./255)
    y_train = torch.tensor([label for _, label in train_dataset], dtype=torch.long)
```

```
    x_test = torch.tensor(x_test.reshape(-1, 14*14).astype("float32")./255)
    y_test = torch.tensor([label for _, label in test_dataset], dtype=torch.long)
```

```
    print("✓ Datasets prepared successfully")
```

```
    return x_train, y_train, x_test, y_test
```

```
@task(name="Create Loaders")
def create_data_loaders(x_train, y_train, x_test, y_test):
    print("Create loaders...")
```

```
    train_loader = DataLoader(TensorDataset(x_train, y_train), batch_size=batch_size, shuffle=True)
    test_loader = DataLoader(TensorDataset(x_test, y_test), batch_size=batch_size, shuffle=False)
```

```
    print("✓ Loaders created!")
```

```
    return train_loader, test_loader
```

```
@task(name="Train model")
def train_model(train_loader):
    print("Train model...")
```

```
    model = NeuralNet(input_size, hidden_size, num_classes).to(device)
    criterion = nn.CrossEntropyLoss()
    optimizer = optim.Adam(model.parameters(), lr=learning_rate)
```

```
    for epoch in range(num_epochs):
        for i, (images, labels) in enumerate(train_loader):
            images = images.to(device).reshape(-1, 14*14)
            labels = labels.to(device)
```

```
            outputs = model(images)
            loss = criterion(outputs, labels)
```

```
            optimizer.zero_grad()
            loss.backward()
            optimizer.step()
```

```
            if (i+1)%100==0:
                print(f"Epoch [{epoch+1}/{num_epochs}], Step [{i+1}/{len(train_loader)}], Loss: {loss.item():.4f}")
```

```

print("✔ Model trained successfully") return model

@task(name="Test model") def test_model(model, test_loader): print("Test model...") with torch.no_grad(): n_correct=0
n_samples=0 for images, labels in test_loader: images=images.to(device).reshape(-1, 14*14) labels=labels.to(device)
outputs=model(images) _, predicted=torch.max(outputs.data, 1) n_samples+=labels.size(0) n_correct+=
(predicted==labels).sum().item()

acc=100.0*n_correct/n_samples print(f"Accuracy of the network on the 10000 test images:{acc}%")

@task(name="Convert To ONNX") def convert_to_onnx(model, onnx_file_path): dummy_input=torch.randn(1,
input_size).to(device) torch.onnx.export( model, dummy_input, onnx_file_path, export_params=True, opset_version=10,
do_constant_folding=True, )

print(f"Model has been converted to ONNX and saved as {onnx_file_path}")

@action(name="Action: Convert To ONNX", log_prints=True) def execution():
x_train, y_train, x_test, y_test=prepare_datasets() train_loader, test_loader=create_data_loaders(x_train, y_train, x_test,
y_test) model=train_model(train_loader) test_model(model, test_loader)

```

Convert to ONNX

```

onnx_file_path="mnist_model.onnx" convert_to_onnx(model, onnx_file_path)

if __name__=="main": action_deploy=Action(entrypoint=execution, name="pytorch-mnist-action")
action_deploy.serve(name="pytorch-mnist-deployment")

...

```

Now you are set to create your first Action deployment! Execute the Action file to deploy it.

...

Copy python mnist_example/train_action.py

...

Your deployment is ready for executions! You can create Actions Runs directly from the Giza [Workspace](#) . To learn more about [creating an Action Run](#) check our linked guided overview.

To deploy the other actions in the mnist_example directory in your workspace, you must first create a model on the Giza platform. To better understand the process, please refer to our [step-by-step tutorial](#) .

What's next?

Congrats! Now that you've completed the Actions quickstart, check out our guides and learn how to do more specific things in our [how-to-guides](#) and [tutorials](#) . If you're interested in learning more about Actions core concepts, grab a cup of coffee and take a look at our [Conceptual Guides](#) !

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