# README for G-Mixup + GTrans Experiments

## 1. Requirements

The following packages are required to run the experiments:  
  
- pytorch==1.7.1  
- cudatoolkit==11.0  
- torch==1.7.1  
- torch\_geometric==1.6.3  
- opencv-python==4.5.3.56  
- scikit-image==0.18.3  
  
To install torch-geometric and its dependencies:  
  
```  
pip install torch\_spline\_conv-1.2.0-cp37-cp37m-linux\_x86\_64.whl  
pip install torch\_scatter-2.0.5-cp37-cp37m-linux\_x86\_64.whl  
pip install torch\_sparse-0.6.8-cp37-cp37m-linux\_x86\_64.whl  
pip install torch\_cluster-1.5.8-cp37-cp37m-linux\_x86\_64.whl  
pip install torch-geometric==1.6.3  
```

## 2. Dataset

The datasets used in the experiments are built-in datasets from torch\_geometric. They will be automatically downloaded to the default location if not present.

## 3. Running Experiments

To run the baseline GIN model without transfer learning or mixup, use:  
```  
sh run\_vanilla.sh  
```  
To run the G-Mixup model, use:  
```  
sh run\_gmixup.sh  
```

## 4. Running GTrans-Enhanced G-Mixup

To run G-Mixup with our proposed GTrans transfer learning method, use the following command:  
  
```  
python gmixup\_transfer.py --dataset IMDB-BINARY --gmixup True --use\_transfer True --epoch 200 --log\_screen True --data\_path ../dataset/loaded/  
```  
  
This will enable structural knowledge transfer using Gromov-Wasserstein alignment between source and target classes.

## 5. Running G-Mixup without Transfer (Baseline)

To run G-Mixup without applying GTrans (i.e., no transfer learning baseline), use:  
  
```  
python gmixup\_no\_transfer\_baseline.py --dataset IMDB-BINARY --gmixup True --method ICE --epoch 200 --log\_screen True  
```