Issues with AudioLottery code

May 5, 2024

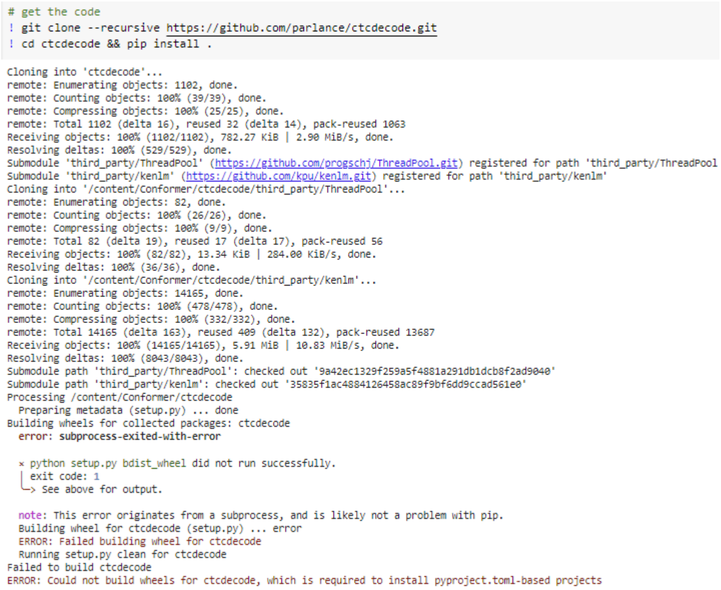
We tried to replicate the Conformer part of AudioLottery on Google colab and we encountered the following issues. (Link to Colab notebook)

1 Problem installing 'ctcdecode' module

We ran the following lines of code to install the module.

```
# get the code
! git clone --recursive https://github.com/parlance/ctcdecode.git
%cd ctcdecode
! pip install .
```

This gave us the following error:



```
# get the code
! git clone --recursive https://github.com/parlance/ctcdecode.git
! cd ctcdecode && pip install .
```

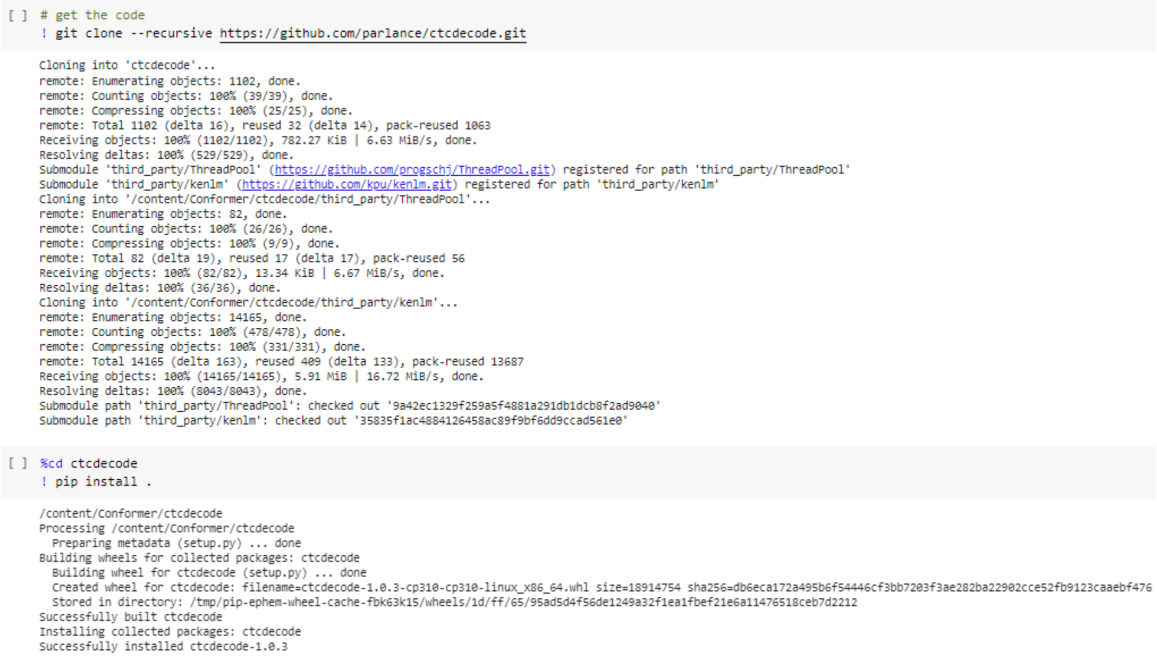
```
Cloning into 'ctcdecode'...
remote: Enumerating objects: 1102, done.
remote: Counting objects: 100% (39/39), done.
remote: Compressing objects: 100% (25/25), done.
remote: Total 1102 (delta 16), reused 32 (delta 14), pack-reused 1063
Receiving objects: 100% (1102/1102), 782.27 KiB | 2.90 MiB/s, done.
Resolving deltas: 100% (529/529), done.
Submodule 'third_party/ThreadPool' (https://github.com/progschj/ThreadPool.git) registered for path 'third_party/ThreadPool
Submodule 'third_party/kenlm' (https://github.com/kpu/kenlm.git) registered for path 'third_party/kenlm'
Cloning into '/content/Conformer/ctcdecode/third_party/ThreadPool'...
remote: Enumerating objects: 82, done.
remote: Counting objects: 100% (26/26), done.
remote: Compressing objects: 100% (9/9), done.
remote: Total 82 (delta 19), reused 17 (delta 17), pack-reused 56
Receiving objects: 100% (82/82), 13.34 KiB | 284.00 KiB/s, done.
Resolving deltas: 100% (36/36), done.
Cloning into '/content/Conformer/ctcdecode/third_party/kenlm'...
remote: Enumerating objects: 14165, done.
remote: Counting objects: 100% (478/478), done.
remote: Compressing objects: 100% (332/332), done.
remote: Total 14165 (delta 163), reused 409 (delta 132), pack-reused 13687
Receiving objects: 100% (14165/14165), 5.91 MiB | 10.83 MiB/s, done.
Resolving deltas: 100% (8043/8043), done.
Submodule path 'third_party/ThreadPool': checked out '9a42ec1329f259a5f4881a291db1dcb8f2ad9040'
Submodule path 'third_party/kenlm': checked out '35835f1ac4884126458ac89f9bf6dd9ccad561e0'
Processing /content/Conformer/ctcdecode
  Preparing metadata (setup.py) ... done
Building wheels for collected packages: ctcdecode
  error: subprocess-exited-with-error

  × python setup.py bdist_wheel did not run successfully.
  │ exit code: 1
  ╰─> See above for output.

  note: This error originates from a subprocess, and is likely not a problem with pip.
  Building wheel for ctcdecode (setup.py) ... error
  ERROR: Failed building wheel for ctcdecode
  Running setup.py clean for ctcdecode
Failed to build ctcdecode
ERROR: Could not build wheels for ctcdecode, which is required to install pyproject.toml-based projects
```

Figure 1: Error

1.1 Fix

'ctcdecode' needs torch 1.11.0 while we were using torch 2.3.0. Thus, the following line fixes the error:

```
! pip install torch==1.11.0
```

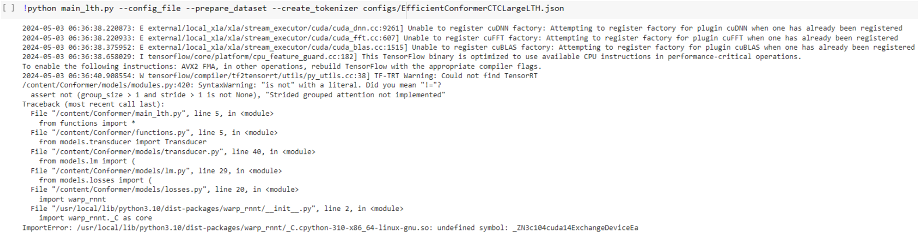


```
[ ] # get the code
    ! git clone --recursive https://github.com/parlance/ctcdecode.git

    Cloning into 'ctcdecode'...
    remote: Enumerating objects: 1102, done.
    remote: Counting objects: 100% (39/39), done.
    remote: Compressing objects: 100% (25/25), done.
    remote: Total 1102 (delta 16), reused 32 (delta 14), pack-reused 1063
    Receiving objects: 100% (1102/1102), 782.27 KiB | 6.63 MiB/s, done.
    Resolving deltas: 100% (529/529), done.
    Submodule 'third_party/ThreadPool' (https://github.com/progschj/ThreadPool.git) registered for path 'third_party/ThreadPool'
    Submodule 'third_party/kenlm' (https://github.com/kpu/kenlm.git) registered for path 'third_party/kenlm'
    Cloning into '/content/Conformer/ctcdecode/third_party/ThreadPool'...
    remote: Enumerating objects: 82, done.
    remote: Counting objects: 100% (26/26), done.
    remote: Compressing objects: 100% (9/9), done.
    remote: Total 82 (delta 19), reused 17 (delta 17), pack-reused 56
    Receiving objects: 100% (82/82), 13.34 KiB | 6.67 MiB/s, done.
    Resolving deltas: 100% (36/36), done.
    Cloning into '/content/Conformer/ctcdecode/third_party/kenlm'...
    remote: Enumerating objects: 14165, done.
    remote: Counting objects: 100% (478/478), done.
    remote: Compressing objects: 100% (331/331), done.
    remote: Total 14165 (delta 163), reused 409 (delta 133), pack-reused 13687
    Receiving objects: 100% (14165/14165), 5.91 MiB | 16.72 MiB/s, done.
    Resolving deltas: 100% (8043/8043), done.
    Submodule path 'third_party/ThreadPool': checked out '9a42ec1329f259a5f4881a291db1dcb8f2ad9040'
    Submodule path 'third_party/kenlm': checked out '35835f1ac4884126458ac89f9bf6dd9ccad561e0'

[ ] %cd ctcdecode
    ! pip install .

    /content/Conformer/ctcdecode
    Processing /content/Conformer/ctcdecode
      Preparing metadata (setup.py) ... done
    Building wheels for collected packages: ctcdecode
      Building wheel for ctcdecode (setup.py) ... done
      Created wheel for ctcdecode: filename=ctcdecode-1.0.3-cp310-cp310-linux_x86_64.whl size=18914754 sha256=db6eca172a495b6f54446cf3bb7203f3ae282ba22902cce52fb9123caaebf476
      Stored in directory: /tmp/pip-ephem-wheel-cache-fbk63k15/wheels/1d/ff/65/95ad5d4f56de1249a32f1ea1fbef21e6a11476518ceb7d2212
    Successfully built ctcdecode
    Installing collected packages: ctcdecode
    Successfully installed ctcdecode-1.0.3
```

Figure 2: Fix

2 Problem with 'warp-rnnt' module

When we tried to run the main_lth.py file, we got the the following error:



```
[ ] !python main_lth.py --config_file --prepare_dataset --create_tokenizer configs/EfficientConformerCTCLargeLTH.json

    2024-05-03 06:36:38.220873: E external/local_xla/xla/stream_executor/cuda/cuda_dnn.cc:9261] Unable to register cuDNN factory: Attempting to register factory for plugin cuDNN when one has already been registered
    2024-05-03 06:36:38.220933: E external/local_xla/xla/stream_executor/cuda/cuda_fft.cc:607] Unable to register cuFFT factory: Attempting to register factory for plugin cuFFT when one has already been registered
    2024-05-03 06:36:38.375952: E external/local_xla/xla/stream_executor/cuda/cuda_blas.cc:1515] Unable to register cuBLAS factory: Attempting to register factory for plugin cuBLAS when one has already been registered
    2024-05-03 06:36:38.658029: I tensorflow/core/platform/cpu_feature_guard.cc:182] This TensorFlow binary is optimized to use available CPU instructions in performance-critical operations.
    To enable the following instructions: AVX2 FMA, in other operations, rebuild TensorFlow with the appropriate compiler flags.
    2024-05-03 06:36:40.908554: W tensorflow/compiler/tf2tensorrt/utils/py_utils.cc:38] TF-TRT Warning: Could not find TensorRT
    /content/Conformer/models/modules.py:420: SyntaxWarning: "is not" with a literal. Did you mean "!="?
      assert not (group_size > 1 and stride > 1 is not None), "Strided grouped attention not implemented"
    Traceback (most recent call last):
      File "/content/Conformer/main_lth.py", line 5, in <module>
        from functions import *
      File "/content/Conformer/functions.py", line 5, in <module>
        from models.transducer import Transducer
      File "/content/Conformer/models/transducer.py", line 40, in <module>
        from models.lm import (
      File "/content/Conformer/models/lm.py", line 29, in <module>
        from models.losses import (
      File "/content/Conformer/models/losses.py", line 20, in <module>
        import warp_rnnt
      File "/usr/local/lib/python3.10/dist-packages/warp_rnnt/__init__.py", line 2, in <module>
        import warp_rnnt._C as core
    ImportError: /usr/local/lib/python3.10/dist-packages/warp_rnnt/_C.cpython-310-x86_64-linux-gnu.so: undefined symbol: _ZN3c104cuda14ExchangeDeviceEa
```

Figure 3: Fix