Compile Libtorch+OpenBLAS on WSL2

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1 Introduction

We will go through how to compile Libtorch + OpenBLAS on windows in this paper. Compiling Libtorch + OpenBLAS directly on Windows will fail because it requires a Linux environment. Thus, we will compile it on WSL2 (Windows Subsystem for Linux), which provides us with a virtual Linux environment. If you haven't install WSL2 and Ubuntu, install them before proceeding.

Machine Specification:

1. Windows 10
2. WSL 2
3. Ubuntu 22.04
4. 16 GB RAM

2 Install Pytorch

In a Windows PowerShell, run `ubuntu` to enter ubuntu system.

Enter a conda environment by running: `conda activate <name>`.

Download the source code of Pytorch and update the existing checkout by running:

```
git clone --recursive https://github.com/pytorch/pytorch
cd pytorch
git submodule sync
git submodule update --init --recursive
```

Install all required dependencies: `pip install -r requirements.txt`.

3 Install OpenBLAS

To download OpenBLAS, run: `git clone https://github.com/OpenMathLib/OpenBLAS`.
The command above will download the source code of OpenBLAS and put it into a newly-created directory called "OpenBLAS".

To install OpenBLAS, run:

```
cd OpenBLAS
make -j8
make install
```

The default installation path is `:/opt/OpenBLAS`

4 Compile Libtorch with OpenBLAS

Create a script called "libtorch_OpenBLAS.sh" with the following content in the directory where Pytorch locates:

```
rm -rf build
mkdir build
cd build
# Set environment variable for OpenBLAS
export OpenBLAS_HOME=/opt/OpenBLAS/
# cmake
# To compile debug version, change -DCMAKE_BUILD_TYPE:STRING=Release \
#                                  ->-DCMAKE_BUILD_TYPE:STRING=Debug \
cmake -G Ninja \
-DBUILD_PYTHON=OFF \
-DUSE_CUDA=OFF \
-DUSE_CUDNN=OFF \
-DUSE_NCCL=OFF \
-DUSE_OPENMP=ON \
-DUSE_BLAS=ON \
-DBLAS=OpenBLAS \
-DUSE_XNNPACK=OFF \
-DBUILD_CAFFE2=OFF \
-DUSE_MKLDNN=OFF \
-DUSE_FBGEMM=OFF \
-DUSE_PYTORCH_QNNPACK=OFF \
-DUSE_EIGEN_FOR_BLAS=OFF \
-DUSE_QNNPACK=OFF \
-DUSE_KINETO=OFF \
-DUSE_NNPACK=OFF \
-DUSE_MKL=OFF \
-DUSE_MKLDNN=OFF \
-DBUILD_CAFFE2_OPS=OFF \
-DBUILD_SHARED_LIBS:BOOL=ON \
-DCMAKE_BUILD_TYPE:STRING=Release \
-DCMAKE_INSTALL_PREFIX:PATH=../libtorch_OpenBLAS \
-DCMAKE_C_COMPILER=/usr/bin/gcc \
-DCMAKE_CXX_COMPILER=/usr/bin/g++ \
../pytorch
ninja install
```

Run the script by: `bash libtorch_OpenBLAS.sh`.
After finishing running the script, a resulting directory called "libtorch_OpenBLAS" will be created and we finished compiling libtorch with OpenBLAS on WLS2.