

```
!ssh-keyscan github.com >> ~/.ssh/known_hosts
!rm -rf model-compression
!git clone https://github.com/hlde0us/model-compression.git

/bin/bash: /root/.ssh/known_hosts: No such file or directory
Cloning into 'model-compression'...
remote: Enumerating objects: 33, done.ote: Counting objects: 100%
(33/33), done.ote: Compressing objects: 100% (24/24), done.ote: Total
33 (delta 10), reused 29 (delta 6), pack-reused 0

%cd model-compression

/kaggle/working/model-compression

!pip install gdown

Collecting gdown
  Downloading gdown-5.1.0-py3-none-any.whl.metadata (5.7 kB)
Requirement already satisfied: beautifulsoup4 in
/opt/conda/lib/python3.10/site-packages (from gdown) (4.12.2)
Requirement already satisfied: filelock in
/opt/conda/lib/python3.10/site-packages (from gdown) (3.13.1)
Requirement already satisfied: requests[socks] in
/opt/conda/lib/python3.10/site-packages (from gdown) (2.31.0)
Requirement already satisfied: tqdm in /opt/conda/lib/python3.10/site-
packages (from gdown) (4.66.1)
Requirement already satisfied: soupsieve>1.2 in
/opt/conda/lib/python3.10/site-packages (from beautifulsoup4->gdown)
(2.5)
Requirement already satisfied: charset-normalizer<4,>=2 in
/opt/conda/lib/python3.10/site-packages (from requests[socks]->gdown)
(3.3.2)
Requirement already satisfied: idna<4,>=2.5 in
/opt/conda/lib/python3.10/site-packages (from requests[socks]->gdown)
(3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/opt/conda/lib/python3.10/site-packages (from requests[socks]->gdown)
(1.26.18)
Requirement already satisfied: certifi>=2017.4.17 in
/opt/conda/lib/python3.10/site-packages (from requests[socks]->gdown)
(2024.2.2)
Requirement already satisfied: PySocks!=1.5.7,>=1.5.6 in
/opt/conda/lib/python3.10/site-packages (from requests[socks]->gdown)
(1.7.1)
Downloading gdown-5.1.0-py3-none-any.whl (17 kB)
Installing collected packages: gdown
Successfully installed gdown-5.1.0

import gdown
url = "https://drive.google.com/uc?
id=1Pzbwlfrp0LvfrCrMjuM1u8Uzd0DH8n2D"
```

```

output = 'student_data_only.pt'
gdown.download(url, output, quiet=False)

Downloading...
From (original): https://drive.google.com/uc?
id=1Pzbwlfrp0LvfrCrMjuMlu8Usd0DH8n2D
From (redirected): https://drive.google.com/uc?
id=1Pzbwlfrp0LvfrCrMjuMlu8Usd0DH8n2D&confirm=t&uuiid=4faf8250-86a4-
4f6e-9636-f7d89c2ae477
To: /kaggle/working/model-compression/student_data_only.pt
100%|██████████| 84.8M/84.8M [00:01<00:00, 67.9MB/s]

'student_data_only.pt'

!ls

README.md  report.ipynb  requirements.txt  student_data_only.pt
task01  task02

!pip install deepsparse==1.7.0 sparseml==1.7.0 torch==1.12.0
torchvision==0.13

Collecting deepsparse==1.7.0
  Downloading deepsparse-1.7.0-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (23 kB)
Collecting sparseml==1.7.0
  Downloading sparseml-1.7.0-py3-none-any.whl.metadata (23 kB)
Collecting torch==1.12.0
  Downloading torch-1.12.0-cp310-cp310-manylinux1_x86_64.whl.metadata
(22 kB)
Collecting torchvision==0.13
  Downloading torchvision-0.13.0-cp310-cp310-
manylinux1_x86_64.whl.metadata (10 kB)
Collecting sparsezoo~=1.7.0 (from deepsparse==1.7.0)
  Downloading sparsezoo-1.7.0-py3-none-any.whl.metadata (20 kB)
Requirement already satisfied: numpy>=1.16.3 in
/opt/conda/lib/python3.10/site-packages (from deepsparse==1.7.0)
(1.26.4)
Collecting onnx<1.15.0,>=1.5.0 (from deepsparse==1.7.0)
  Downloading onnx-1.14.1-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (15 kB)
Collecting pydantic<2.0.0,>=1.8.2 (from deepsparse==1.7.0)
  Downloading pydantic-1.10.14-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (150 kB)
150.2/150.2 kB 4.5 MB/s eta
0:00:00
Requirement already satisfied: requests>=2.0.0 in
/opt/conda/lib/python3.10/site-packages (from deepsparse==1.7.0)
(2.31.0)
Requirement already satisfied: tqdm>=4.0.0 in
/opt/conda/lib/python3.10/site-packages (from deepsparse==1.7.0)

```

```
(4.66.1)
Requirement already satisfied: protobuf>=3.12.2 in
/opt/conda/lib/python3.10/site-packages (from deepsparse==1.7.0)
(3.20.3)
Requirement already satisfied: click!=8.0.0,>=7.1.2 in
/opt/conda/lib/python3.10/site-packages (from deepsparse==1.7.0)
(8.1.7)
Collecting setuptools<=59.5.0 (from sparseml==1.7.0)
  Downloading setuptools-59.5.0-py3-none-any.whl.metadata (5.0 kB)
Requirement already satisfied: pyyaml>=5.0.0 in
/opt/conda/lib/python3.10/site-packages (from sparseml==1.7.0) (6.0.1)
Requirement already satisfied: matplotlib>=3.0.0 in
/opt/conda/lib/python3.10/site-packages (from sparseml==1.7.0) (3.7.5)
Collecting merge-args>=0.1.0 (from sparseml==1.7.0)
  Downloading merge_args-0.1.5-py2.py3-none-any.whl.metadata (3.7 kB)
Requirement already satisfied: pandas>=0.25.0 in
/opt/conda/lib/python3.10/site-packages (from sparseml==1.7.0) (2.1.4)
Requirement already satisfied: packaging>=20.0 in
/opt/conda/lib/python3.10/site-packages (from sparseml==1.7.0) (21.3)
Requirement already satisfied: psutil>=5.0.0 in
/opt/conda/lib/python3.10/site-packages (from sparseml==1.7.0) (5.9.3)
Requirement already satisfied: scikit-learn>=0.24.2 in
/opt/conda/lib/python3.10/site-packages (from sparseml==1.7.0) (1.2.2)
Collecting toposort>=1.0 (from sparseml==1.7.0)
  Downloading toposort-1.10-py3-none-any.whl.metadata (4.1 kB)
Collecting GPUUtil>=1.4.0 (from sparseml==1.7.0)
  Downloading GPUUtil-1.4.0.tar.gz (5.5 kB)
  Preparing metadata (setup.py) ... ent already satisfied:
scipy>=1.0.0 in /opt/conda/lib/python3.10/site-packages (from
sparseml==1.7.0) (1.11.4)
Requirement already satisfied: typing-extensions in
/opt/conda/lib/python3.10/site-packages (from torch==1.12.0) (4.9.0)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in
/opt/conda/lib/python3.10/site-packages (from torchvision==0.13)
(9.5.0)
Requirement already satisfied: contourpy>=1.0.1 in
/opt/conda/lib/python3.10/site-packages (from matplotlib>=3.0.0-
>sparseml==1.7.0) (1.2.0)
Requirement already satisfied: cycler>=0.10 in
/opt/conda/lib/python3.10/site-packages (from matplotlib>=3.0.0-
>sparseml==1.7.0) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in
/opt/conda/lib/python3.10/site-packages (from matplotlib>=3.0.0-
>sparseml==1.7.0) (4.47.0)
Requirement already satisfied: kiwisolver>=1.0.1 in
/opt/conda/lib/python3.10/site-packages (from matplotlib>=3.0.0-
>sparseml==1.7.0) (1.4.5)
Requirement already satisfied: pyparsing>=2.3.1 in
/opt/conda/lib/python3.10/site-packages (from matplotlib>=3.0.0-
```

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>sparseml==1.7.0) (3.1.1)
Requirement already satisfied: python-dateutil>=2.7 in
/opt/conda/lib/python3.10/site-packages (from matplotlib>=3.0.0-
>sparseml==1.7.0) (2.9.0.post0)
Requirement already satisfied: pytz>=2020.1 in
/opt/conda/lib/python3.10/site-packages (from pandas>=0.25.0-
>sparseml==1.7.0) (2023.3.post1)
Requirement already satisfied: tzdata>=2022.1 in
/opt/conda/lib/python3.10/site-packages (from pandas>=0.25.0-
>sparseml==1.7.0) (2023.4)
Requirement already satisfied: charset-normalizer<4,>=2 in
/opt/conda/lib/python3.10/site-packages (from requests>=2.0.0-
>deepsparse==1.7.0) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in
/opt/conda/lib/python3.10/site-packages (from requests>=2.0.0-
>deepsparse==1.7.0) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/opt/conda/lib/python3.10/site-packages (from requests>=2.0.0-
>deepsparse==1.7.0) (1.26.18)
Requirement already satisfied: certifi>=2017.4.17 in
/opt/conda/lib/python3.10/site-packages (from requests>=2.0.0-
>deepsparse==1.7.0) (2024.2.2)
Requirement already satisfied: joblib>=1.1.1 in
/opt/conda/lib/python3.10/site-packages (from scikit-learn>=0.24.2-
>sparseml==1.7.0) (1.3.2)
Requirement already satisfied: threadpoolctl>=2.0.0 in
/opt/conda/lib/python3.10/site-packages (from scikit-learn>=0.24.2-
>sparseml==1.7.0) (3.2.0)
Collecting py-machineid>=0.3.0 (from sparsezoo~=1.7.0-
>deepsparse==1.7.0)
  Downloading py_machineid-0.5.1-py3-none-any.whl.metadata (2.3 kB)
Collecting geocoder>=1.38.0 (from sparsezoo~=1.7.0->deepsparse==1.7.0)
  Downloading geocoder-1.38.1-py2.py3-none-any.whl.metadata (14 kB)
Collecting onnxruntime>=1.0.0 (from sparsezoo~=1.7.0-
>deepsparse==1.7.0)
  Downloading onnxruntime-1.17.1-cp310-cp310-
manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl.metadata (4.3 kB)
Requirement already satisfied: future in
/opt/conda/lib/python3.10/site-packages (from geocoder>=1.38.0-
>sparsezoo~=1.7.0->deepsparse==1.7.0) (1.0.0)
Collecting ratelim (from geocoder>=1.38.0->sparsezoo~=1.7.0-
>deepsparse==1.7.0)
  Downloading ratelim-0.1.6-py2.py3-none-any.whl.metadata (1.4 kB)
Requirement already satisfied: six in /opt/conda/lib/python3.10/site-
packages (from geocoder>=1.38.0->sparsezoo~=1.7.0->deepsparse==1.7.0)
(1.16.0)
Collecting coloredlogs (from onnxruntime>=1.0.0->sparsezoo~=1.7.0-
>deepsparse==1.7.0)
  Downloading coloredlogs-15.0.1-py2.py3-none-any.whl.metadata (12 kB)

```

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Requirement already satisfied: flatbuffers in
/opt/conda/lib/python3.10/site-packages (from onnxruntime>=1.0.0-
>sparsezoo~=1.7.0->deepparse==1.7.0) (23.5.26)
Requirement already satisfied: sympy in
/opt/conda/lib/python3.10/site-packages (from onnxruntime>=1.0.0-
>sparsezoo~=1.7.0->deepparse==1.7.0) (1.12)
Collecting humanfriendly>=9.1 (from coloredlogs->onnxruntime>=1.0.0-
>sparsezoo~=1.7.0->deepparse==1.7.0)
  Downloading humanfriendly-10.0-py2.py3-none-any.whl.metadata (9.2
kB)
Requirement already satisfied: decorator in
/opt/conda/lib/python3.10/site-packages (from ratelim-
>geocoder>=1.38.0->sparsezoo~=1.7.0->deepparse==1.7.0) (5.1.1)
Requirement already satisfied: mpmath>=0.19 in
/opt/conda/lib/python3.10/site-packages (from sympy-
>onnxruntime>=1.0.0->sparsezoo~=1.7.0->deepparse==1.7.0) (1.3.0)
Downloading deepparse-1.7.0-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (47.1 MB)
----- 47.1/47.1 MB 34.5 MB/s eta
0:00:00:00:0100:01
l-1.7.0-py3-none-any.whl (1.3 MB)
----- 1.3/1.3 MB 48.3 MB/s eta
0:00:00
anylinux1_x86_64.whl (776.3 MB)
----- 776.3/776.3 MB 2.0 MB/s eta
0:00:00:00:0100:01
anylinux1_x86_64.whl (19.1 MB)
----- 19.1/19.1 MB 8.4 MB/s eta
0:00:0000:00:0100:01
erge_args-0.1.5-py2.py3-none-any.whl (6.0 kB)
Downloading onnx-1.14.1-cp310-cp310-
manylinux_2_17_x86_64.manylinux2014_x86_64.whl (14.6 MB)
----- 14.6/14.6 MB 18.6 MB/s eta
0:00:00:00:0100:01
anylinux_2_17_x86_64.manylinux2014_x86_64.whl (3.1 MB)
----- 3.1/3.1 MB 14.3 MB/s eta
0:00:00:00:01
----- 952.4/952.4 kB 6.5 MB/s eta
0:00:00:00:01
----- 177.6/177.6 kB 1.5 MB/s eta
0:00:00:00:01
----- 98.6/98.6 kB 906.1 kB/s eta
0:00:00a 0:00:01
e-1.17.1-cp310-cp310-manylinux_2_27_x86_64.manylinux_2_28_x86_64.whl
(6.8 MB)
----- 6.8/6.8 MB 22.6 MB/s eta
0:00:00:00:0100:01
achineid-0.5.1-py3-none-any.whl (4.7 kB)
Downloading coloredlogs-15.0.1-py2.py3-none-any.whl (46 kB)

```

```
46.0/46.0 kB 439.9 kB/s eta
0:00:00a 0:00:01
-0.1.6-py2.py3-none-any.whl (4.0 kB)
Downloading humanfriendly-10.0-py2.py3-none-any.whl (86 kB)
86.8/86.8 kB 2.0 MB/s eta
0:00:00eta 0:00:01
e=GPUtil-1.4.0-py3-none-any.whl size=7393
sha256=c466e9173b896a831b508fb18e39f24362898c27d14680c437d0aa0febd4f45
9
  Stored in directory:
/root/.cache/pip/wheels/a9/8a/bd/81082387151853ab8b6b3ef33426e98f5cbfe
bc3c397a9d4d0
Successfully built GPUtil
Installing collected packages: toposort, py-machineid, merge-args,
GPUtil, torch, setuptools, ratelim, pydantic, onnx, humanfriendly,
torchvision, geocoder, coloredlogs, onnxruntime, sparsezoo, sparseml,
deepsparse
  Attempting uninstall: torch
    Found existing installation: torch 2.1.2
    Uninstalling torch-2.1.2:
      Successfully uninstalled torch-2.1.2
  Attempting uninstall: setuptools
    Found existing installation: setuptools 69.0.3
    Uninstalling setuptools-69.0.3:
      Successfully uninstalled setuptools-69.0.3
  Attempting uninstall: pydantic
    Found existing installation: pydantic 2.5.3
    Uninstalling pydantic-2.5.3:
      Successfully uninstalled pydantic-2.5.3
  Attempting uninstall: onnx
    Found existing installation: onnx 1.15.0
    Uninstalling onnx-1.15.0:
      Successfully uninstalled onnx-1.15.0
  Attempting uninstall: torchvision
    Found existing installation: torchvision 0.16.2
    Uninstalling torchvision-0.16.2:
      Successfully uninstalled torchvision-0.16.2
ERROR: pip's dependency resolver does not currently take into account
all the packages that are installed. This behaviour is the source of
the following dependency conflicts.
tensorflow-decision-forests 1.8.1 requires wurlitzer, which is not
installed.
arviz 0.17.1 requires setuptools>=60.0.0, but you have setuptools
59.5.0 which is incompatible.
conda 23.7.4 requires setuptools>=60.0.0, but you have setuptools
59.5.0 which is incompatible.
pytorch-lightning 2.2.1 requires torch>=1.13.0, but you have torch
1.12.0 which is incompatible.
stable-baselines3 2.1.0 requires torch>=1.13, but you have torch
```

```
1.12.0 which is incompatible.
tensorflow 2.15.0 requires keras<2.16,>=2.15.0, but you have keras
3.0.5 which is incompatible.
torchdata 0.7.1 requires torch>=2, but you have torch 1.12.0 which is
incompatible.
ydata-profiling 4.6.4 requires numpy<1.26,>=1.16.0, but you have numpy
1.26.4 which is incompatible.
ydata-profiling 4.6.4 requires pydantic>=2, but you have pydantic
1.10.14 which is incompatible.
Successfully installed GPUUtil-1.4.0 coloredlogs-15.0.1 deepsparse-
1.7.0 geocoder-1.38.1 humanfriendly-10.0 merge-args-0.1.5 onnx-1.14.1
onnxruntime-1.17.1 py-machineid-0.5.1 pydantic-1.10.14 ratelim-0.1.6
setuptools-59.5.0 sparseml-1.7.0 sparsezoo-1.7.0 toposort-1.10 torch-
1.12.0 torchvision-0.13.0
```

```
%cd task02
```

```
/kaggle/working/model-compression/task02
```

```
!python3 example_train_sparse_and_quantize.py --batch_size 256 --
checkpoint /kaggle/working/model-compression/student_data_only.pt
```

```
/opt/conda/lib/python3.10/site-packages/torch/onnx/utils.py:439:
UserWarning: It is recommended that constant folding be turned off
('do_constant_folding=False') when exporting the model in training-
amenable mode, i.e. with 'training=TrainingMode.TRAIN' or
'training=TrainingMode.PRESERVE' (when model is in training mode).
Otherwise, some learnable model parameters may not translate correctly
in the exported ONNX model because constant folding mutates model
parameters. Please consider turning off constant folding or setting
the training=TrainingMode.EVAL.
```

```
warnings.warn(
```

```
Downloading https://www.cs.toronto.edu/~kriz/cifar-10-python.tar.gz to
./data/cifar-10-python.tar.gz
```

```
100%|████████████████████| 170498071/170498071 [00:02<00:00,
67814746.33it/s]
```

```
Extracting ./data/cifar-10-python.tar.gz to ./data
```

```
Files already downloaded and verified
```

```
2024-03-30 00:53:14 sparseml.pytorch.utils.logger INFO      Logging all
SparseML modifier-level logs to sparse_logs/30-03-2024_00.53.14.log
```

```
Training loss: 0.004 Training accuracy: 0.999 Testing accuracy:
```

```
0.999: 91%|██████████|
```

```
Traceback (most recent call last):
```

```
File
```

```
"/kaggle/working/model-compression/task02/example_train_sparse_and_qua
ntize.py", line 136, in <module>
```

```
    main()
```

```
File
```

```
"/kaggle/working/model-compression/task02/example_train_sparse_and_qua
ntize.py", line 126, in main
```

```
    epoch_loss, epoch_acc = train_one_epoch(model, train_loader,
optimizer, criterion, device)
File
"/kaggle/working/model-compression/task02/example_train_sparse_and_qua
ntize.py", line 52, in train_one_epoch
    loss.backward()
File "/opt/conda/lib/python3.10/site-packages/torch/_tensor.py",
line 396, in backward
    torch.autograd.backward(self, gradient, retain_graph,
create_graph, inputs=inputs)
File
"/opt/conda/lib/python3.10/site-packages/torch/autograd/__init__.py",
line 173, in backward
    Variable._execution_engine.run_backward( # Calls into the C++
engine to run the backward pass
RuntimeError: one of the variables needed for gradient computation has
been modified by an inplace operation: [torch.cuda.FloatTensor [256,
2048, 1, 1]], which is output 0 of ReluBackward0, is at version 1;
expected version 0 instead. Hint: enable anomaly detection to find the
operation that failed to compute its gradient, with
torch.autograd.set_detect_anomaly(True).
```