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Project#3

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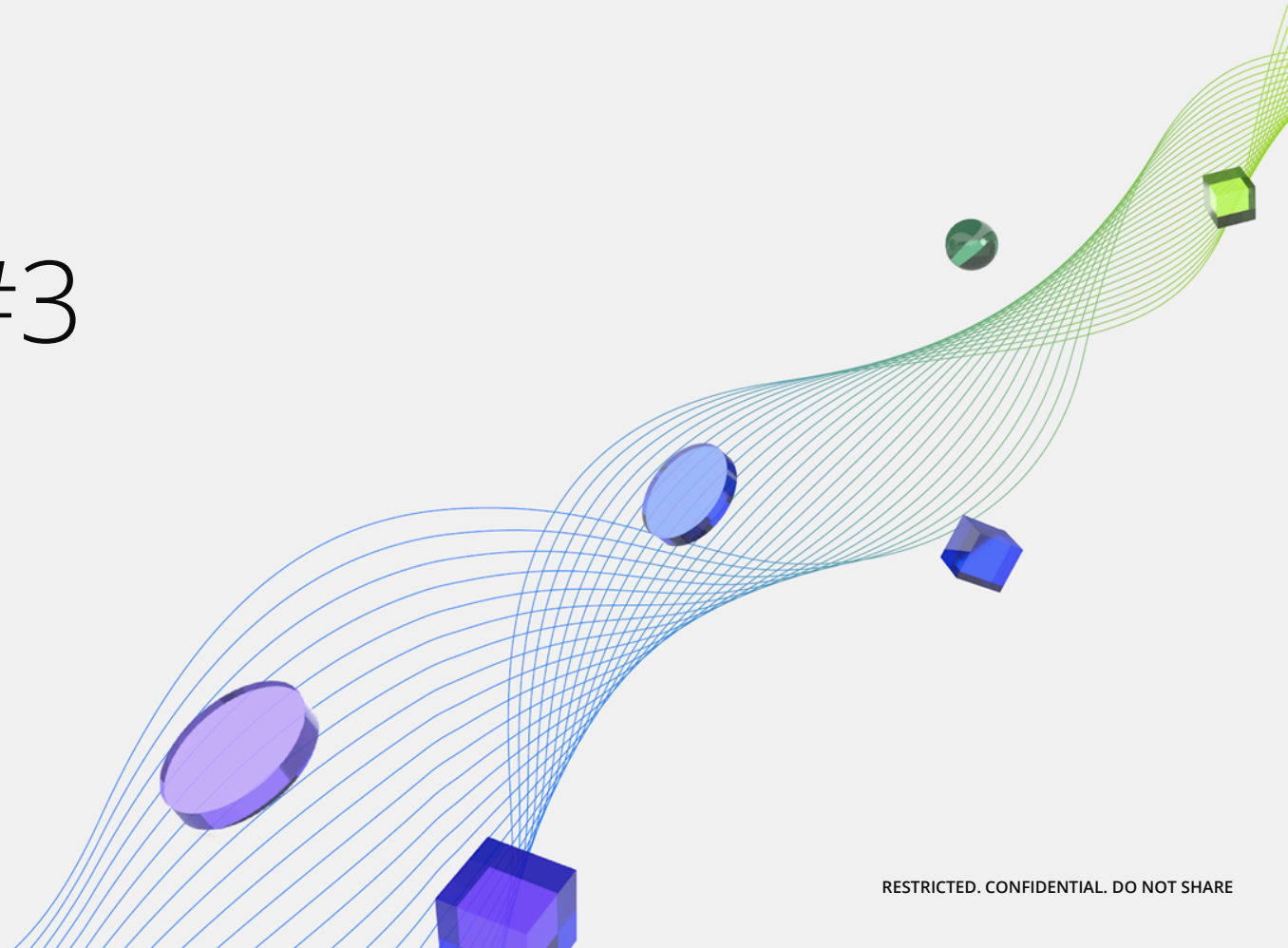
LinkedIn

July, 12, 2024



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Connect Sessions | Purpose

A Connect Session **IS**:

- Focused on learning, encouragement & graduation for a group of students coached by a Udacity Session Lead
- Setting weekly study goals
- Helping each other with progress (including peer to peer)
- Keeping everyone accountable for their responsibilities
- A way to meet individuals in tech field & learn about the industry
- **Mandatory**

A Connect Session **IS NOT**:

- A social meetup
- A study group
- A substitute for online learning
- **Optional**

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Let’s check your progress

You are encouraged to spend at lest 10 hours/week to graduate.

Presentation date

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Attendance is taken automatically

Please change your name to be First Name and Last name on Zoom
Like : Lamia Zain

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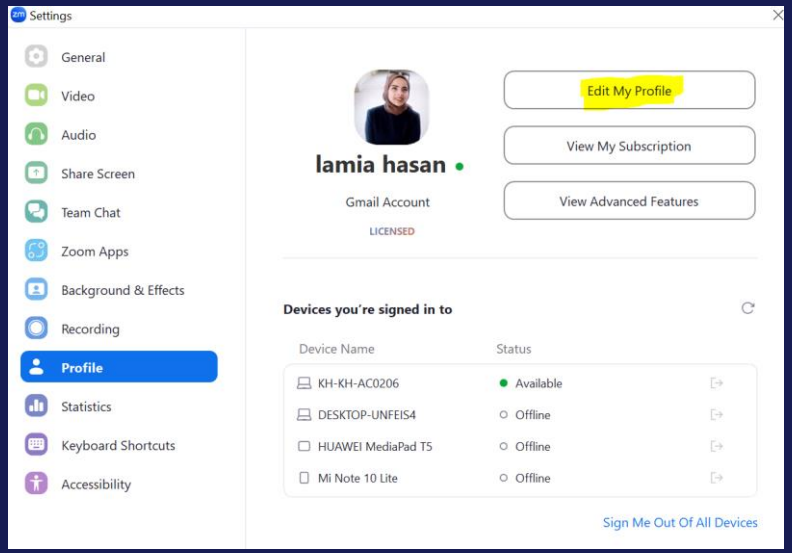
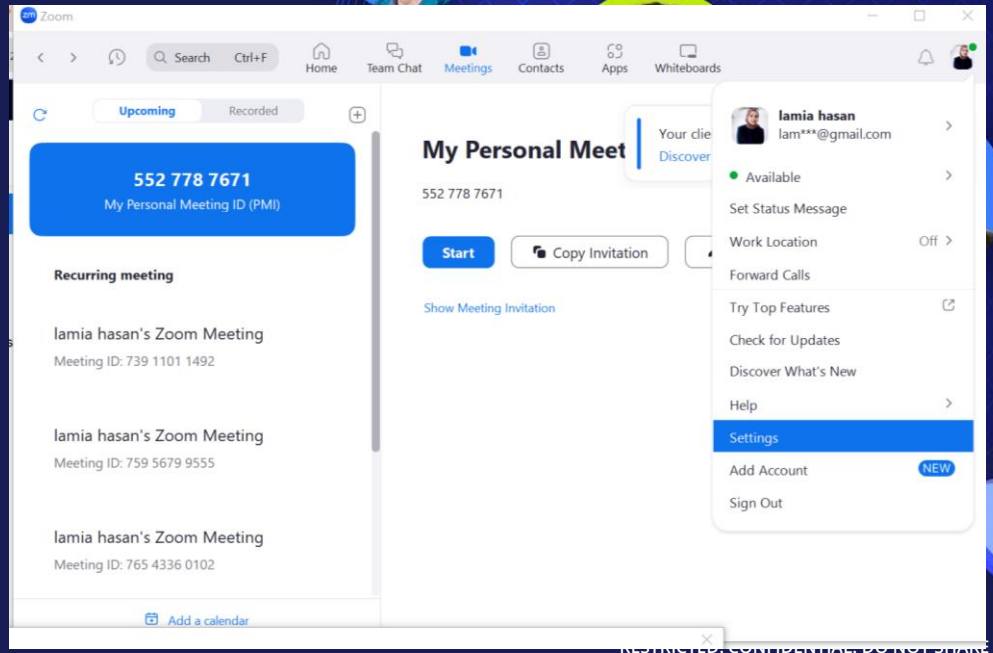
Change your Name on Zoom





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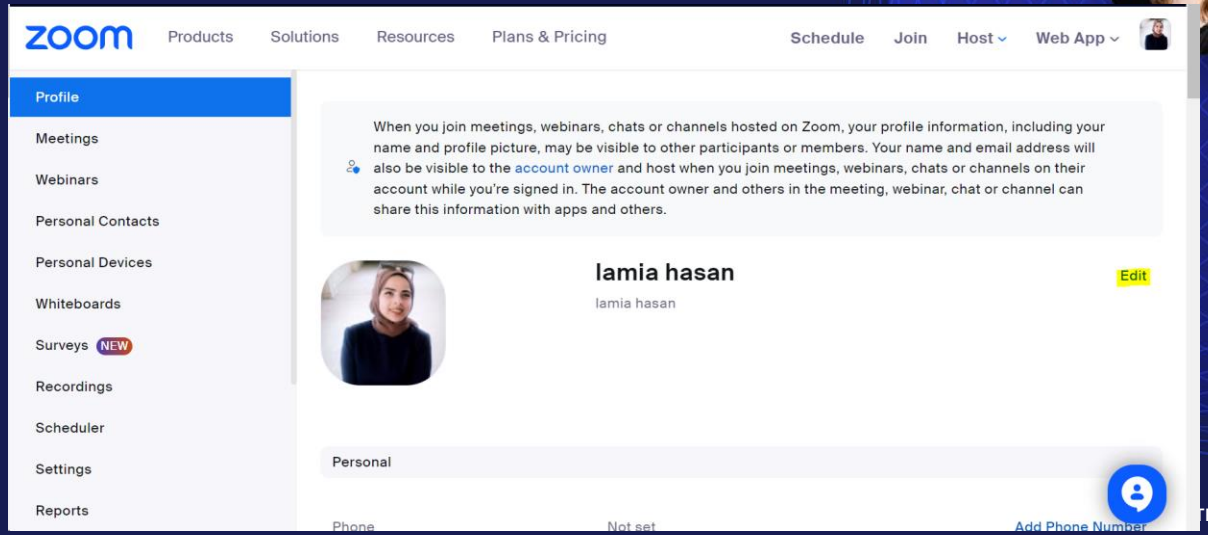

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Session Lead role:

Communication Chart

Issue	Where to go?
Classroom access/ Withdrawal/ Graduation issues/ Plagiarism/ Project Review Inquiries	Email support@udacity.com
Technical Issues, Attendance, Content Related Issues/ Project inquiries	Session Lead
Session Switch/ Community related issues	Community Moderators

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Program Timeline & Learning Journey

2024

April | May | June | July | August

- **Program Kickoff** — April 10, 2024
- **Revoking Deadline** — May 12, 2024
- **First Project Submission** — May 1, 2024
- **Second Project Submission** — June 5, 2024
- **Third Project Submission** — July 10, 2024
- **Fourth Project Submission** — August 21, 2024
- **End of Program** — August 28, 2024

Program Period — April 10 - August 28, 2024

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Four-weeks Agenda, Weekly schedule

Week 10	Jun 12, 2024			Finish the lessons below from **the Convolutional Neural Networks** Introduction to CNNs CNN Concepts **[Work on/submit the #3 project: Landmark Classification & Tagging for Social Media]**	Convolutional Neural Networks Introduction to CNNs CNN Concepts
Week 11	Jun 19, 2024			Finish the lessons below from **the Convolutional Neural Networks** CNNs in Depth **[Work on/submit the #3 project: Landmark Classification & Tagging for Social Media]**	Convolutional Neural Networks CNNs in Depth
Week 12	Jun 26, 2024			Finish the lessons below from **the Convolutional Neural Networks** Transfer Learning **[Work on/submit the #3 project: Landmark Classification & Tagging for Social Media]**	Convolutional Neural Networks Transfer Learning
Week 13	Jul 3, 2024			Finish the lessons below from **the Convolutional Neural Networks** Autoencoders **[Work on/submit the #3 project: Landmark Classification & Tagging for Social Media]**	Convolutional Neural Networks Autoencoders Project Walkthrough: Landmark Classification & Tagging for Social Media
Week 14	Jul 10, 2024	Jul 10, 2024	**Landmark Classification & Tagging for Social Media**	Finish the lessons below from **the Convolutional Neural Networks** Object Detection and Segmentation **[Work on/submit the #3 project: Landmark Classification & Tagging for Social Media]**	Convolutional Neural Networks Object Detection and Segmentation Project Walkthrough: Landmark Classification & Tagging for Social Media

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Student Milestone | Revoking

REVOKING

Revoking is the process by which Udacity removes a student from a Nanodegree program.

AWS reserves the right to revoke you from the program if you do not comply with program requirements.

CRITERIA

Students can be revoked if they fail to:

- Submit Project 1
- Complete the required concepts

The date of **Revoking** for the scholarship is **May 12, 2024**

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Code of Conduct | Plagiarism

BASIC RULES

- Project submissions must consist of original work
- Submitted projects will be scanned for plagiarism
- Students who are found to have plagiarised will risk their Nanodegree being revoked
- Read the honor code and the rubric carefully for all projects

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Recap

- Batch Normalization
- Data Augmentation
- Train a Custom CNN model with the Tiny ImageNet Dataset From HuggingFace

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Recap

- GAP Layers
- Attention Layers
- Transfer Learning
- Use a Pretrained model with the Tiny ImageNet Dataset From HuggingFace

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Project

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Tip: *Use the GPU only during training the model and calculating the accuracy of the model saved*

(Enable the GPU for steps 5-7 in CNN_from_scratch.ipynb)

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If Consumed all Udacity Given GPU:

1- Email support to add extra hours to your account (scholarships-support@udacity.com)

2- You can use SageMaker studio Lab free GPU (4 hours / day)

3- Migrate to AWS account with SageMaker studio classic

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If Consumed all Udacity Given GPU:

4- You can use the gateway of project#4 Carefully if needed

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If Consumed all Udacity Given GPU:

Common approach is to remove all versions of the libraries in the requirements.txt file and let pip decide which versions to install

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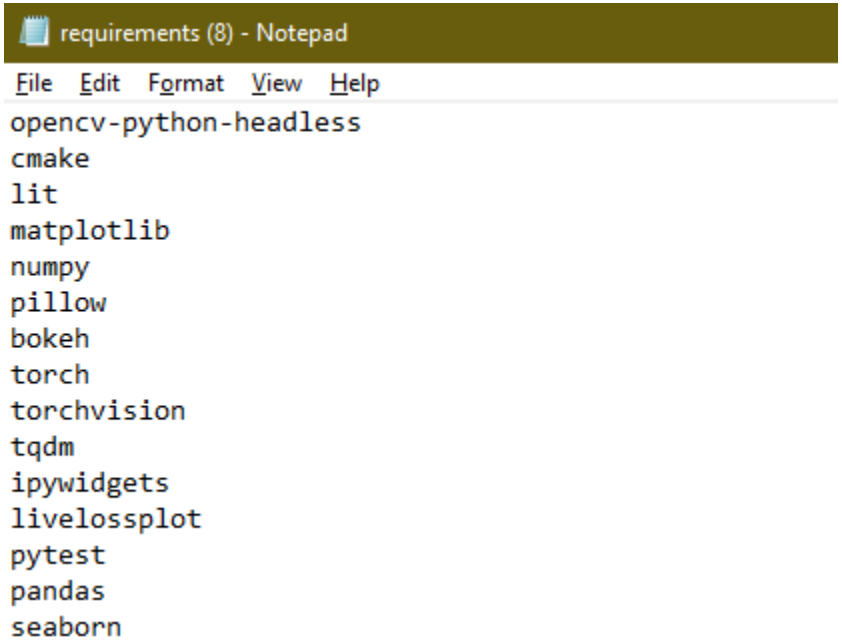
AWS kernels aren't supporting python3.7 anymore.
If you are using Udacity's classroom instance, skip this part.



Remove packages' versions in requirements.txt.
Let pip install the versions compatible with one another and with Python 3.10

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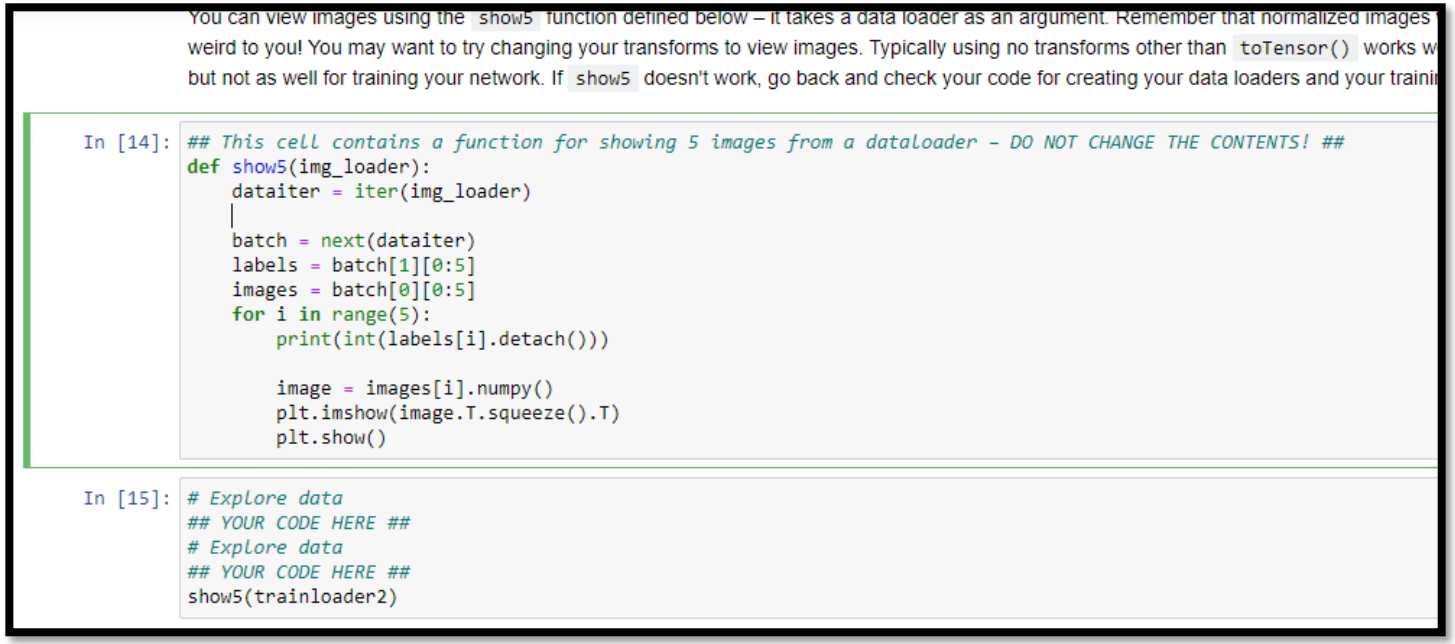
next(dataiter)in python3.10 vs dataiter.next() in python3.7


You can view images using the `show5` function defined below – it takes a data loader as an argument. Remember that normalized images
weird to you! You may want to try changing your transforms to view images. Typically using no transforms other than `toTensor()` works w
but not as well for training your network. If `show5` doesn't work, go back and check your code for creating your data loaders and your traini

In [14]:
```
## This cell contains a function for showing 5 images from a dataloader – DO NOT CHANGE THE CONTENTS! ##
def show5(img_loader):
    dataiter = iter(img_loader)

    batch = next(dataiter)
    labels = batch[1][0:5]
    images = batch[0][0:5]
    for i in range(5):
        print(int(labels[i].detach()))

        image = images[i].numpy()
        plt.imshow(image.T.squeeze().T)
        plt.show()
```

In [15]:
```
# Explore data
## YOUR CODE HERE ##
# Explore data
## YOUR CODE HERE ##
show5(trainloader2)
```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Some errors you might face

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Pytest error (Udacity Workspace)

```
In [4]: !pytest -vv src/data.py -k data_loaders
        #!python -m pytest -vv src/data.py -k data_loaders

        /bin/sh: 1: pytest: not found
```


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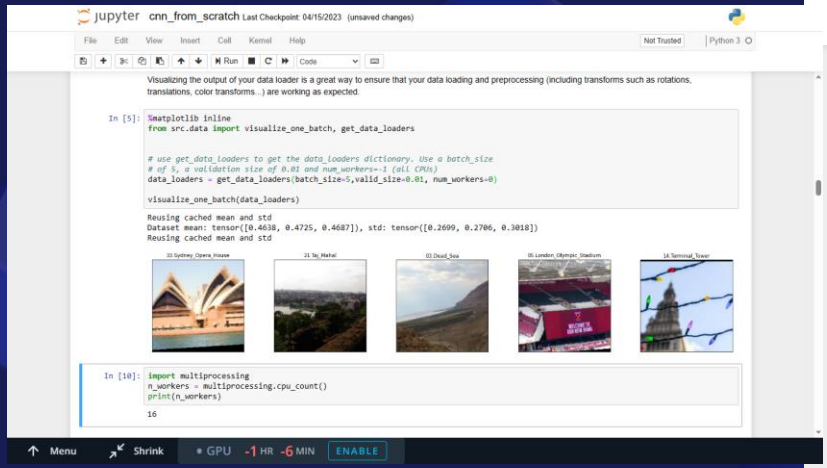
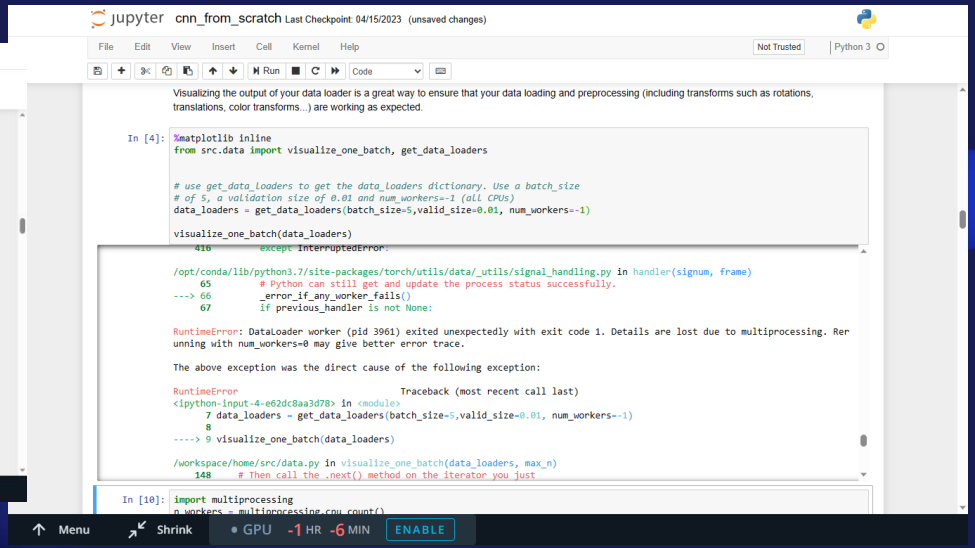
Num_worker error





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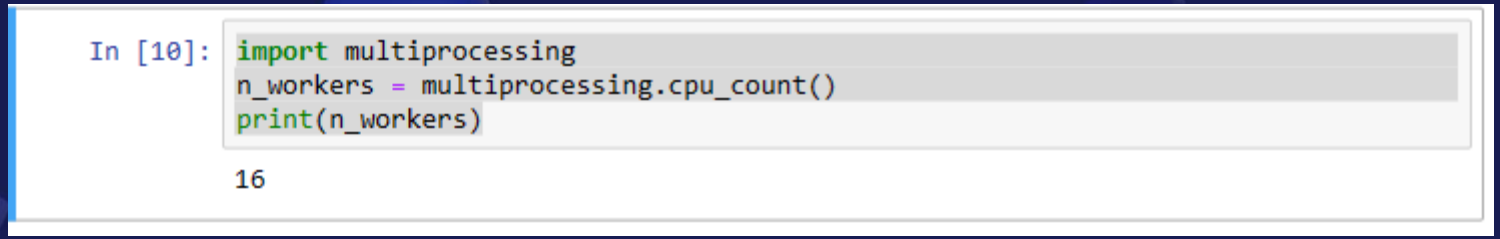
Num_worker error

When setting **num_workers=-1**, the get_data_loaders function in data.py calculates number of cores for multi processing which seems to have a problem in pytorch old versions



1.Use multi-threading instead: If **num_workers** continues to cause problems, consider using multi-threading (**num_workers=0** or **num_workers=1**), which might work better in certain environments.
2.Update PyTorch: Make sure you are using the latest version of PyTorch. Updates often include bug fixes and improvements that could resolve the issue.

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Num_worker error

jupyter data.py a few seconds ago

File Edit View Language

```
12
13  def get_data_loaders(
14      batch_size: int = 32, valid_size: float = 0.2, num_workers: int = 0, limit: int = -1
15  ):
16      """
17      Create and returns the train_one_epoch, validation and test data loaders.
18
19      :param batch_size: size of the mini-batches
20      :param valid_size: fraction of the dataset to use for validation. For example 0.2
21                         means that 20% of the dataset will be used for validation
22      :param num_workers: number of workers to use in the data loaders. Use -1 to mean
23                          "use all my cores"
24      :param limit: maximum number of data points to consider
25      :return a dictionary with 3 keys: 'train_one_epoch', 'valid' and 'test' containing respectively the
26              train_one_epoch, validation and test data loaders
27      """
28
29      if num_workers == -1:
30          # Use all cores
31          num_workers = multiprocessing.cpu_count()
32
33      # We will fill this up later
34      data_loaders = {"train": None, "valid": None, "test": None}
35
36      base_path = Path(get_data_location())
37
38      # Compute mean and std of the dataset
39      mean, std = compute_mean_and_std()
40      print(f"Dataset mean: {mean}, std: {std}")
41
```


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Any change you do to any .py file, restart your notebook to see an action

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Cnn_from_scrach
Tips regarding the model architecture:
Avoid excessive Data Augmentation

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Tips: Avoid Many Dropout Layers in your architecture

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Access the checkpoints folder

Solved

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App.py Problems

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```
from ipywidgets import VBox, Button, FileUpload, Output, Label
from PIL import Image
from IPython.display import display
import io
import numpy as np
import torchvision
import torchvision.transforms as T
import torch

learn_inf = torch.jit.load("checkpoints access/transfer_exported.pt")

# Load image that has been uploaded
img = Image.open("eiffel-tower.jpg") #eiffel-tower.jpg #Dead sea.jpg

img.load()

ratio = img.size[0] / img.size[1]
c = img.copy()
c.thumbnail([ratio * 200, 200])
display(c)

    # Transform to tensor
timg = T.ToTensor()(img).unsqueeze_(0)

    # Calling the model
softmax = learn_inf(timg).data.cpu().numpy().squeeze()

    # Get the indexes of the classes ordered by softmax
    # (larger first)
idxs = np.argsort(softmax)[::-1]

# Loop over the classes with the largest softmax
for i in range(5):
    # Get softmax value
    p = softmax[idxs[i]]
    # Get class name
    landmark_name = learn_inf.class_names[idxs[i]]
    print(f"{landmark_name} (prob: {p:.2f})")
```

Cell Input

```
16.Eiffel_Tower (prob: 0.50)
14.Terminal_Tower (prob: 0.20)
47.Prague_Astronomical_Clock (prob: 0.08)
48.Whitby_Abbey (prob: 0.07)
19.Vienna_City_Hall (prob: 0.03)
```

Cell Output

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- Try updating the jupyter nbconvert by running this following command in a separate cell.

```
!pip install --upgrade jupyter nbconvert
```


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- If you faced this error, One way to work around is to use an online tool that would convert the ipynb file to HTML file.

```
In [2]: !python src/create_submit_pkg.py
            return inline.renderer.finalize(data)
          File "/home/ec2-user/anaconda3/envs/amazonei_pytorch_latest_p37/lib/python3.7/site-packages/mistune/renderers.py", line 22
        0, in finalize
            return ''.join(data)
          File "/home/ec2-user/anaconda3/envs/amazonei_pytorch_latest_p37/lib/python3.7/site-packages/mistune/block_parser.py", line
        291, in _iter_render
            yield method(children, *params)
          File "/home/ec2-user/anaconda3/envs/amazonei_pytorch_latest_p37/lib/python3.7/site-packages/nbconvert/filters/markdown_mist
        une.py", line 181, in block_code
            lang = info.strip().split(None, 1)[0]
        IndexError: list index out of range
        Traceback (most recent call last):
          File "src/create_submit_pkg.py", line 40, in <module>
            create_submit_pkg()
          File "src/create_submit_pkg.py", line 20, in create_submit_pkg
            subprocess.check_call(cmd_line, shell=True)
          File "/home/ec2-user/anaconda3/envs/amazonei_pytorch_latest_p37/lib/python3.7/subprocess.py", line 363, in check_call
            raise CalledProcessError(retcode, cmd)
        subprocess.CalledProcessError: Command 'jupyter nbconvert --to html cnn_from_scratch.ipynb' returned non-zero exit status 1.
```


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Project submission should be a zip file not a tar.gz file

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Break (10 minutes)

Satisfaction Survey

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Any Question?

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Thank you

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