Table of Contents

[1. Introduction to Deep Learning 2](#_Toc39102476)

[Lesson 1: Welcome to the Deep Learning Nanodegree 2](#_Toc39102477)

[Lesson 2: Knowledge, Community, and Careers 2](#_Toc39102478)

[Lesson 3: Get Help with Your Account 2](#_Toc39102479)

[Lesson 4: Anaconda 3](#_Toc39102480)

[Lesson 5: Applying Deep Learning 3](#_Toc39102481)

[Lesson 6: Jupyter Notebooks 3](#_Toc39102482)

[Lesson 7: Matrix Math and NumPy Refresher 3](#_Toc39102483)

[2. Neural Networks 4](#_Toc39102484)

[3. Convolutional Neural Networks 5](#_Toc39102485)

[4. Recurrent Neural Networks 6](#_Toc39102486)

[5. Generative Adversarial Networks 7](#_Toc39102487)

[6. Deploying a Model 8](#_Toc39102488)

# 1. Introduction to Deep Learning

## Lesson 1: Welcome to the Deep Learning Nanodegree

## Lesson 2: Knowledge, Community, and Careers

1.1 Instructor: Cezanne & Matt & Luis

1.2 Program Structure

## Lesson 3: Get Help with Your Account

1.3 Community Guidelines

1.4 Career Portal

## Lesson 4: Anaconda

1.5 Anaconda

a. Create a conda environment: conda create -n [env\_name] python=[2|3] *or* conda -n [env\_name] python=[2|3] [package names]

b. Enter a conda environment: conda activate [env\_name

c. List the libraries installed : conda list

d. Install packages (and dependencies): conda install numpy pandas matplotlib

e. Install Jupyter Notebook: conda install jupyter notebook

f. Remove a package: conda remove [package name]

g. Update a package version: conda update [package name *or* conda update --all

h. Search a package: conda search [package name] *(wildcard can be used, e.g.* conda search ‘\*nump\*’*)*

i. Exit from a conda environment: conda deactivate

j. Export a conda environment to a YAML file: conda env export > conda\_environment.yaml

k. Create an environment with the name specified in the file from an YAML file: conda env create -f conda\_environment.yaml

l. List all conda environments: conda env list *(\* is the current env)*

m. Remove an environment: conda env remove -n [env name]

n. Practices :

* Create Python 2 environment: conda create -n py2 python=2
* Create Python 3 environment: conda create -n py3 python=3
* Create an conda environment for each project
* It is a good practice to share your conda & pip environment using conda env export > conda\_environment.yamland pip freeze > pip\_requirements.txt while sharing projects on GitHub

1.6 Anaconda & Miniconda

a. Anaconda

Anaconda is a distribution of software that comes with conda, Python, scientific packages and their dependencies.

b. Miniconda

Miniconda is a smaller distribution that includes only conda and Python

c. Conda

Conda is a program (a package and environment manager). It is similar with `pip`, default package manager

`pip` focuses on general use, while `conda` focuses on data science

1.7 Python 2 and Python 3

a. a print function works for Python 2.6+

|  |
| --- |
| *from \_\_future\_\_ import print\_function*  *print(“Hello World”)* |

## Lesson 5: Applying Deep Learning

1.8 Deep learning applications

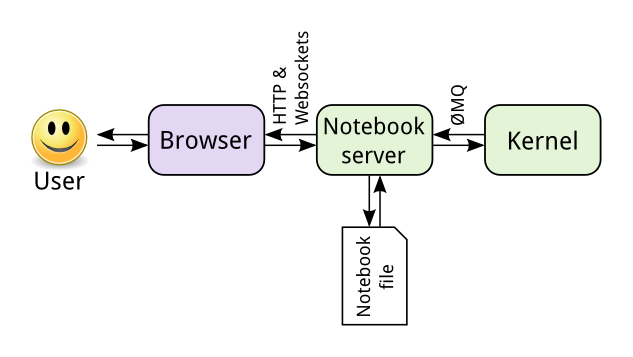
a. Style Transfer (go ./reference applications/Fast Style Transfer)

b. Deep Traffic (go ./reference applications/Deep Traffic/)

c. Flappy Bird (go ./reference applications/Flappy Bird/)

## Lesson 6: Jupyter Notebooks

1.9 Jupyter Notebook



*(image from Jupyter documentation)*

Notebook seen by browser is a web application.

The web application connects Python/R/other kernel through notebook server.

Kernel runs Python/R code and sends back the results to server, then is rendered in the browser.

Saving the code actually saves a “.json” file on the server and a code text file “.ipynb”

**Advantages:**

1) Notebook and kernel are separate, so code in any language can be sent between server and kernel.

2) We can access to a remote server at anywhere where the data and notebook files are stored, e.g. Amazon EC2.

**Install Jupyter Notebook:**

Run conda install jupyter notebook or pip install jupyter notebook

**Launch jupyter notebook:**

Run jupyter notebook on the terminal

Default URL: http://localhost:8888

**Install kernels**: <https://ipython.readthedocs.io/en/latest/install/kernel_install.html>

**Install Notebook conda**: Run conda install nb\_conda helps to manager conda envs

**Panels**

****

1) Files: files & folders

2) Running: list all currently running notebooks

3) Clusters: is taken over by *ipyparallel*

4) Conda: help manager conda environments

**Attention:**

1) Before shutting down, save all the changes in notebook

## Lesson 7: Matrix Math and NumPy Refresher

# 2. Neural Networks

# 3. Convolutional Neural Networks

# 4. Recurrent Neural Networks

# 5. Generative Adversarial Networks

# 6. Deploying a Model