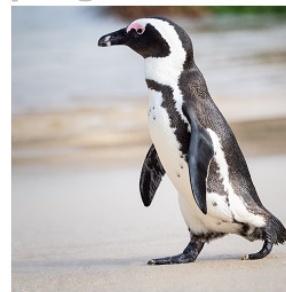# Convolutional Neural Networks

for

Image Classification
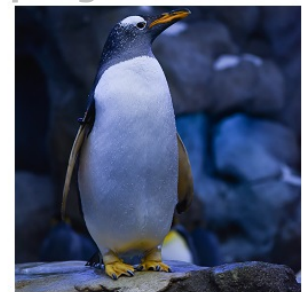
How many CP pairs of layers?
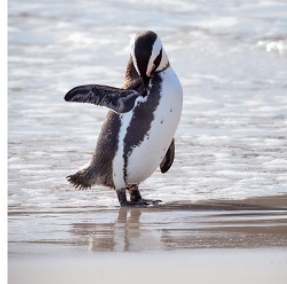
penguin: 0.872

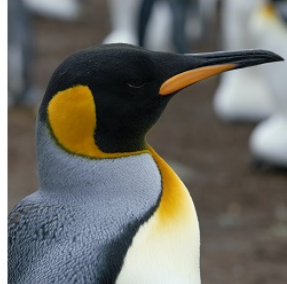penguin: 0.817

penguin: 0.764

penguin: 0.908

penguin: 0.977

penguin: 0.951

penguin: 0.916

penguin: 0.856

penguin: 0.973

How many Convolutional-Pooling pairs of layers?
"Select deepness of network by number of convolutional and pooling layers in a sequence. Interpret notation."

Step 1: download files from Resources
Navigate to *Resources* of the lecture 'How many Convolutional-Pooling pairs of layers?' and download one 'ipynb' file and one 'pdf' file.

Table 1. Download code file and PDF file from Resources

Filename	Description
convolutional_pooling_pairs.ipynb	Selects deepness of CNN models
Design-Deep-CNN-models.pdf	Keeps designed architectures by the help of notation

Step 2: create new folder

Open *File manager* and create new folder *'Section5'* inside existing folder *'CNNCourse'*. Place downloaded files into created folder *'Section5'*. You should have following hierarchy.

```
CNNCourse
├── Section1
├── Section2
├── Section3
├── Section4
└── Section5
    ├── convolutional_pooling_pairs.ipynb
    └── Design-Deep-CNN-models.pdf
```
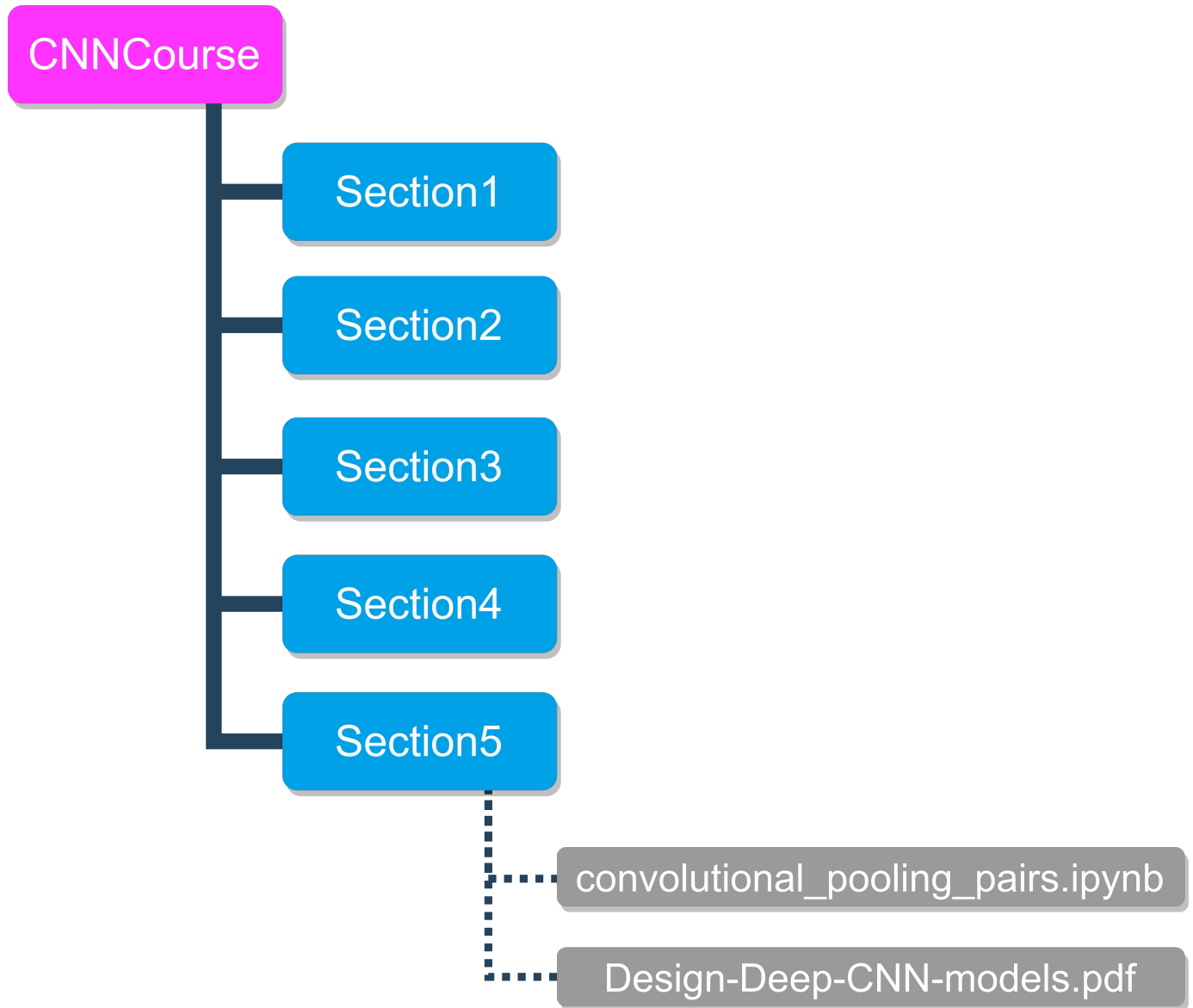
Step 3: run code file 'convolutional_pooling_pairs.ipynb'

Open *Terminal Window* on Linux system. If you're on macOS, then also open *Terminal*. If you're on Windows, then open *Anaconda Prompt*. All the commands are the same for Linux, macOS and Windows.

Table 2. Select deepness of CNN models in Jupyter Notebook

Command	Description
conda activate cnncpu	Activates environment with name 'cnncpu'
jupyter notebook	Runs Jupyter Notebook

When the browser window is opened, navigate to 'convolutional_pooling_pairs.ipynb' file and run all cells.

Links:
Check out additional links with extra information for further readings

- ✓ Sequential class
- ✓ Convolution layers
- ✓ Pooling layers
- ✓ Dropout layer
- ✓ Flatten layer
- ✓ Dense layer
- ✓ Layer activation functions
- ✓ Losses
- ✓ Metrics
- ✓ 'to_categorical' function
- ✓ 'plot_model' function
- ✓ Model saving