

CS4243-Lab 1

Python with Computer Vision

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Environment

- Install anaconda3: <https://docs.anaconda.com/anaconda/install/>
(Choose the suitable version with respect to your system Win/MacOS/Linux)
- Open Terminal (MacOS/Linux/Anaconda Prompt for win10), create working environment for CS4243, and then activate it.
 - >conda create -n CS4243 python=3.5 (versions >=3.5 should be OK)
 - >activate CS4243
- Install some basic libs> pip install numpy, matplotlib, opencv-python, pillow, scikit-image, scikit-video
- Check your installation: type python and write some codes.
- Exit and install jupyter (PyCharm should be OK, and will introduce it later)

```
(CS4243) C:\Users\Junbin>python
Python 3.5.4 |Continuum Analytics, Inc.| (default, Aug 14 2017, 13:41:13) [MSC v.1900 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Hello World")
Hello World
>>> exit()

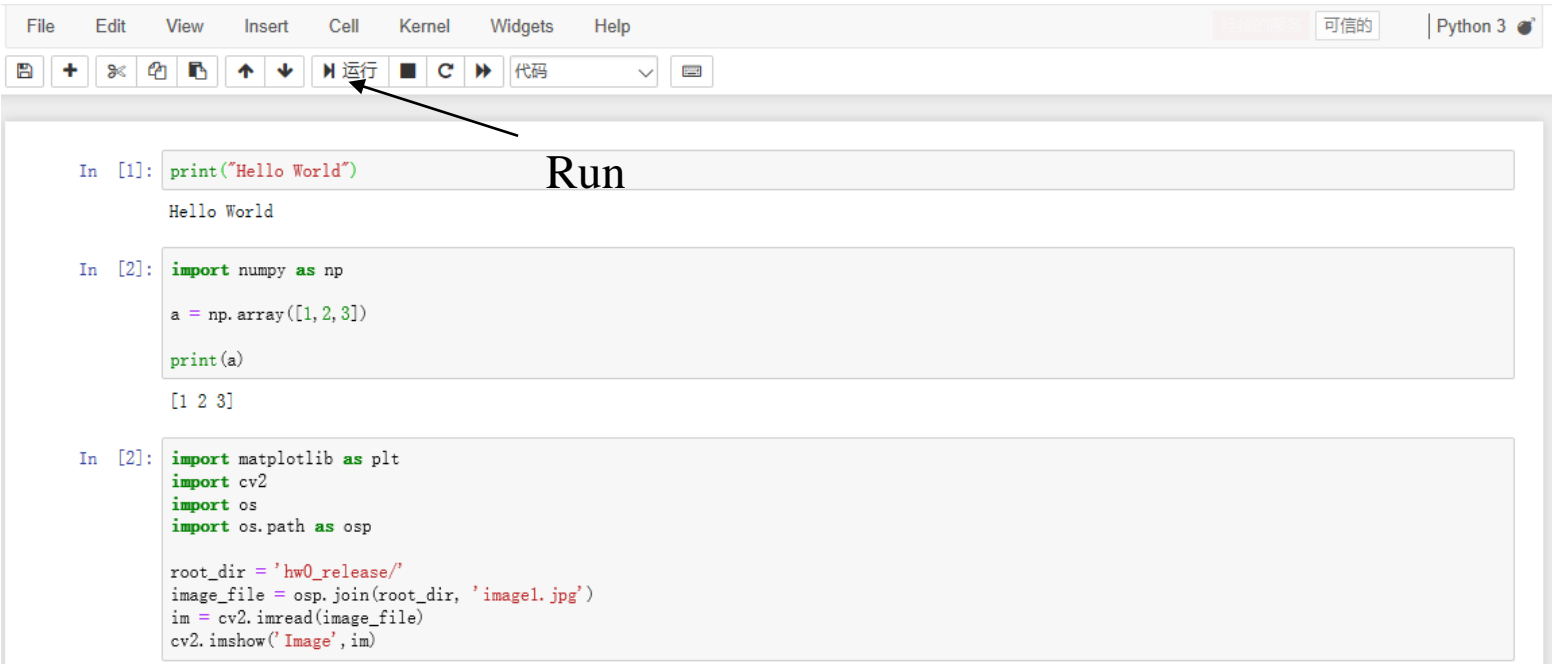
(CS4243) C:\Users\Junbin>pip install jupyter
```

- Navigate to your workspace and start jupyter notebook.
 - >jupyter notebook

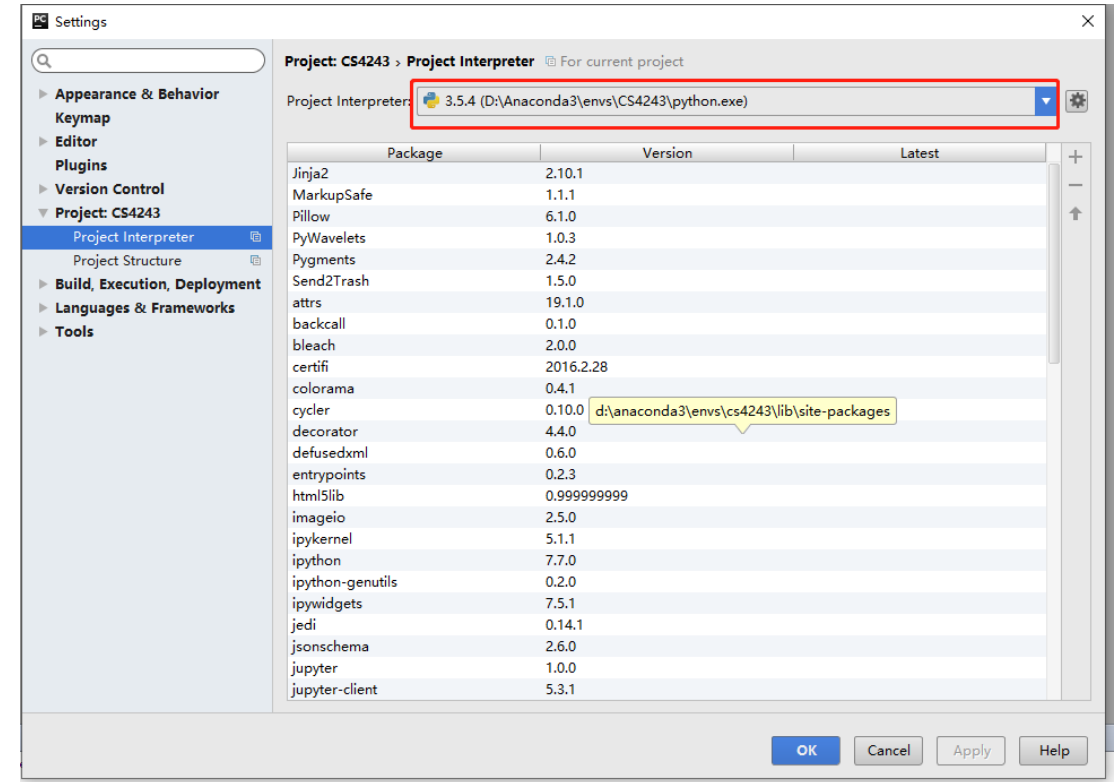
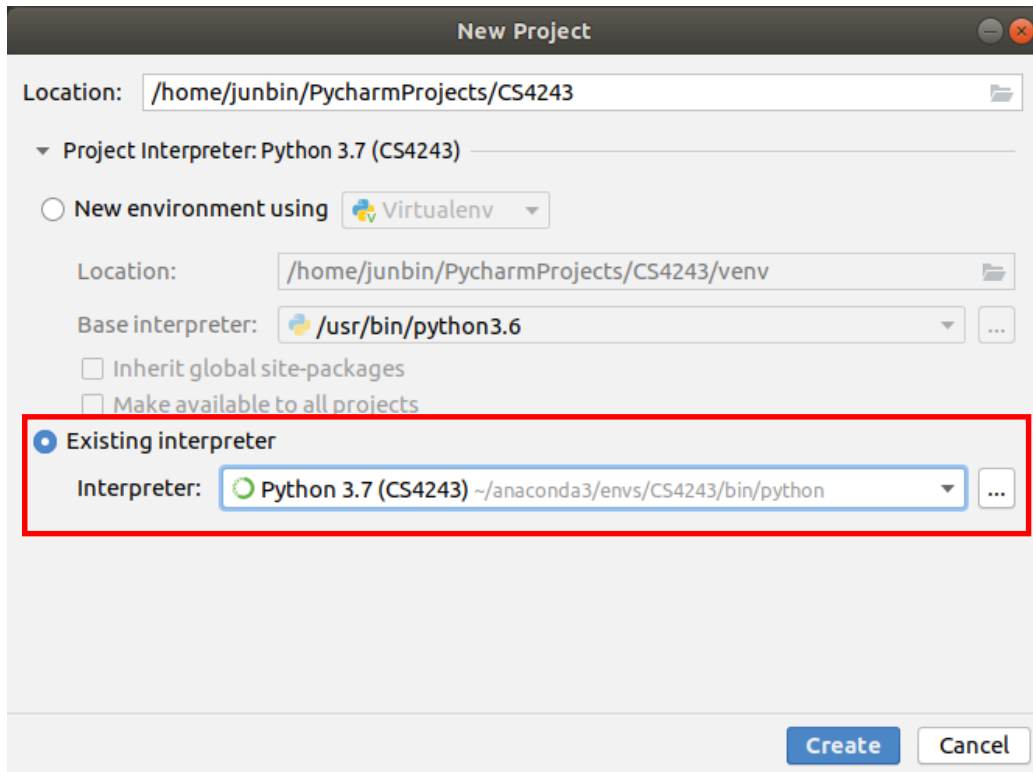
In your browser, create notebook.



Type some code.



- Install PyCharm: <https://www.jetbrains.com/help/pycharm/installation-guide.html>
 - Create new project, choose the path_to_your_anaconda3/envs/CS4243 as your envs.
- Or you can select the right interpreter by file->setting->



Project

New

- File
- Directory
- Python Package
- Python File
- HTML File
- Stylesheet
- JavaScript File
- CoffeeScript File
- Gherkin feature file
- Edit File Templates...
- Data Source

Cut Ctrl+X

Copy Ctrl+C

Copy Path Ctrl+Shift+C

Copy as Plain Text

Copy Reference Ctrl+Alt+Shift+C

Paste Ctrl+V

Find Usages Alt+F7

Find in Path... Ctrl+Shift+F

Replace in Path... Ctrl+Shift+R

Inspect Code...

Refactor

Clean Python Compiled Files

Add to Favorites

Show Image Thumbnails Ctrl+Shift+T

Run 'Unittests in CS4243' Ctrl+Shift+F10

Debug 'Unittests in CS4243'

Run 'Unittests in CS4243' with Coverage

Profile 'Unittests in CS4243'

Concurrency Diagram for 'Unittests in CS4243'

Create 'Unittests in CS4243'...

Local History

Synchronize 'CS4243'

Show in Explorer

File Path Ctrl+Alt+F12

Compare With... Ctrl+D

Mark Directory As

Create Gist...

Search Everywhere [Double Shift](#)

Go to File [Ctrl+Shift+N](#)

Recent Files [Ctrl+E](#)

Navigation Bar [Alt+Home](#)

Drop files here from Explorer

```
D:\Anaconda3\envs\CS5242\python.exe "D:\PyCharm 5.0.4\helpers\pydev\pydevconsole.py" 53177 53178
PyDev console: starting.

import sys: print('Python %s on %s' % (sys.version, sys.platform))
sys.path.extend(['E:\pycharm\CS4243'])

Python 3.5.4 |Continuum Analytics, Inc. | (default, Aug 14 2017, 13:41:13) [MSC v.1900 64 bit (AMD64)] on win32

>>>
```

CS4243 - [E:\pycharm\CS4243] - ...\hello.py - PyCharm 5.0.4

File Edit View Navigate Code Refactor Run Tools VCS Window Help

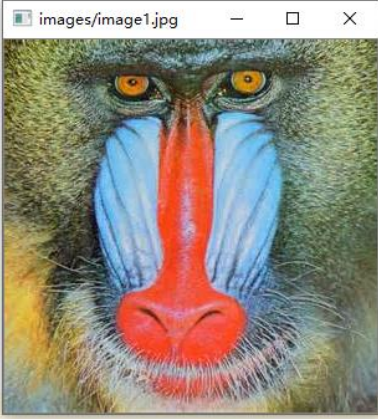
CS4243 > hello.py

Project: CS4243 (E:\pycharm\CS4243)

- images
- hello.py
- External Libraries

```
7 import cv2
8
9 def sayHello(msg):
10     """
11     Prints the input message to the console
12     :param msg:
13     :return:
14     """
15     print(msg)
16
17 def showImage(image_file):
18     """
19     read image and show
20     :param image_file:
21     :return:
22     """
23     img = cv2.imread(image_file)
24     cv2.imshow(image_file, img)
25     cv2.waitKey(-1)
26
27 def main():
28     msg= "Hello World"
29     sayHello(msg)
30     image_file = "images/image1.jpg"
31     showImage(image_file)
32
33 if __name__ == '__main__':
34     main()
```

images/image1.jpg



Run: hello

D:\Anaconda3\envs\CS4243\python.exe E:/pycharm/CS4243/hello.py

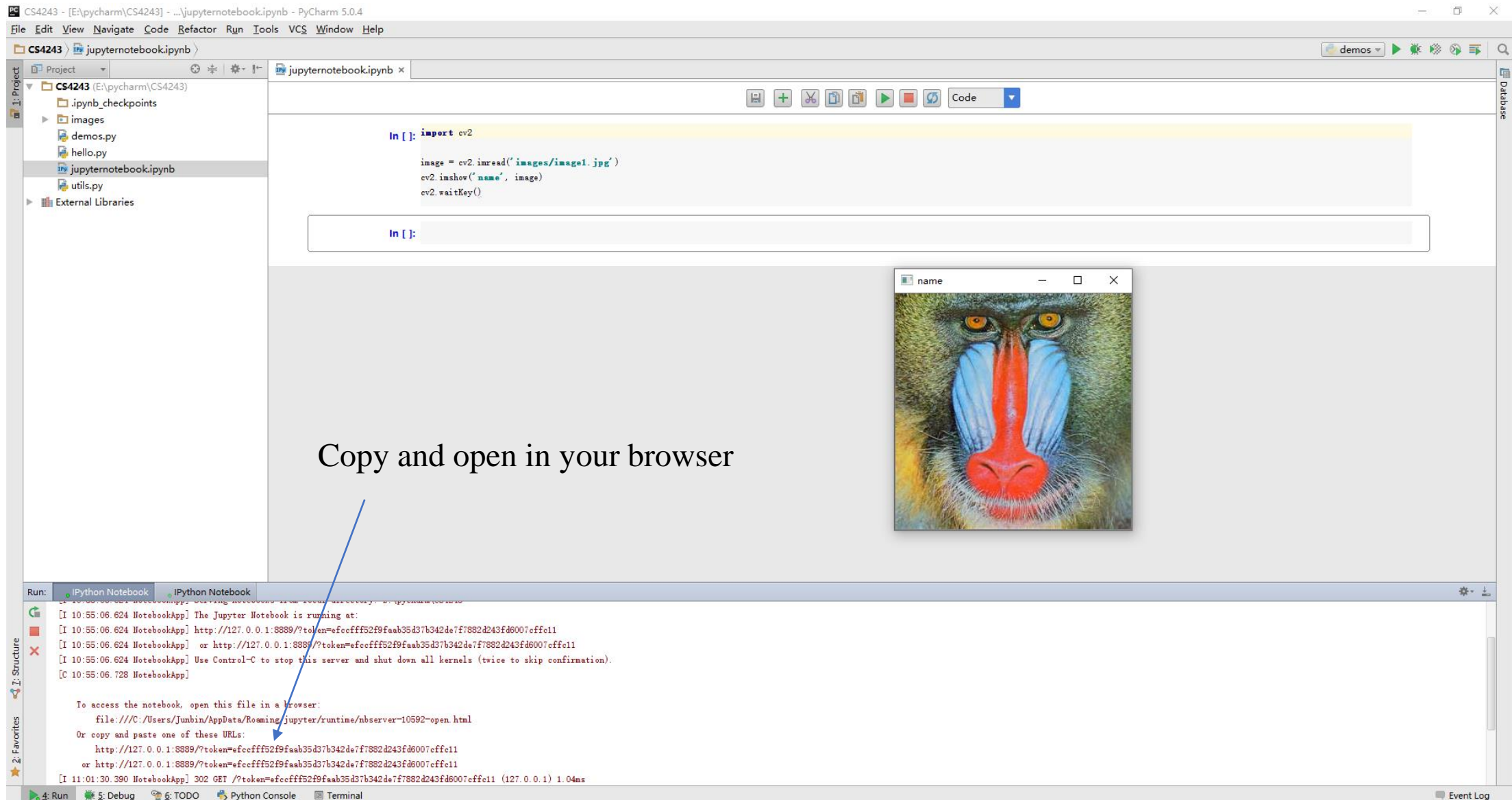
Hello World

Run TODO Python Console Terminal

Event Log

3:1 CRLF UTF-8

Create any .ipynb file, use jupyter notebook in PyCharm



The screenshot shows the PyCharm 5.0.4 interface with a Jupyter Notebook open. The notebook has two input cells. The first cell contains the following code:

```
In [ ]: import cv2  
  
image = cv2.imread('images/image1.jpg')  
cv2.imshow('name', image)  
cv2.waitKey()
```

The second cell is empty. The output of the first cell is a window titled 'name' displaying a baboon image. The console at the bottom shows the Jupyter Notebook server running and provides instructions on how to access the notebook in a browser.

Copy and open in your browser

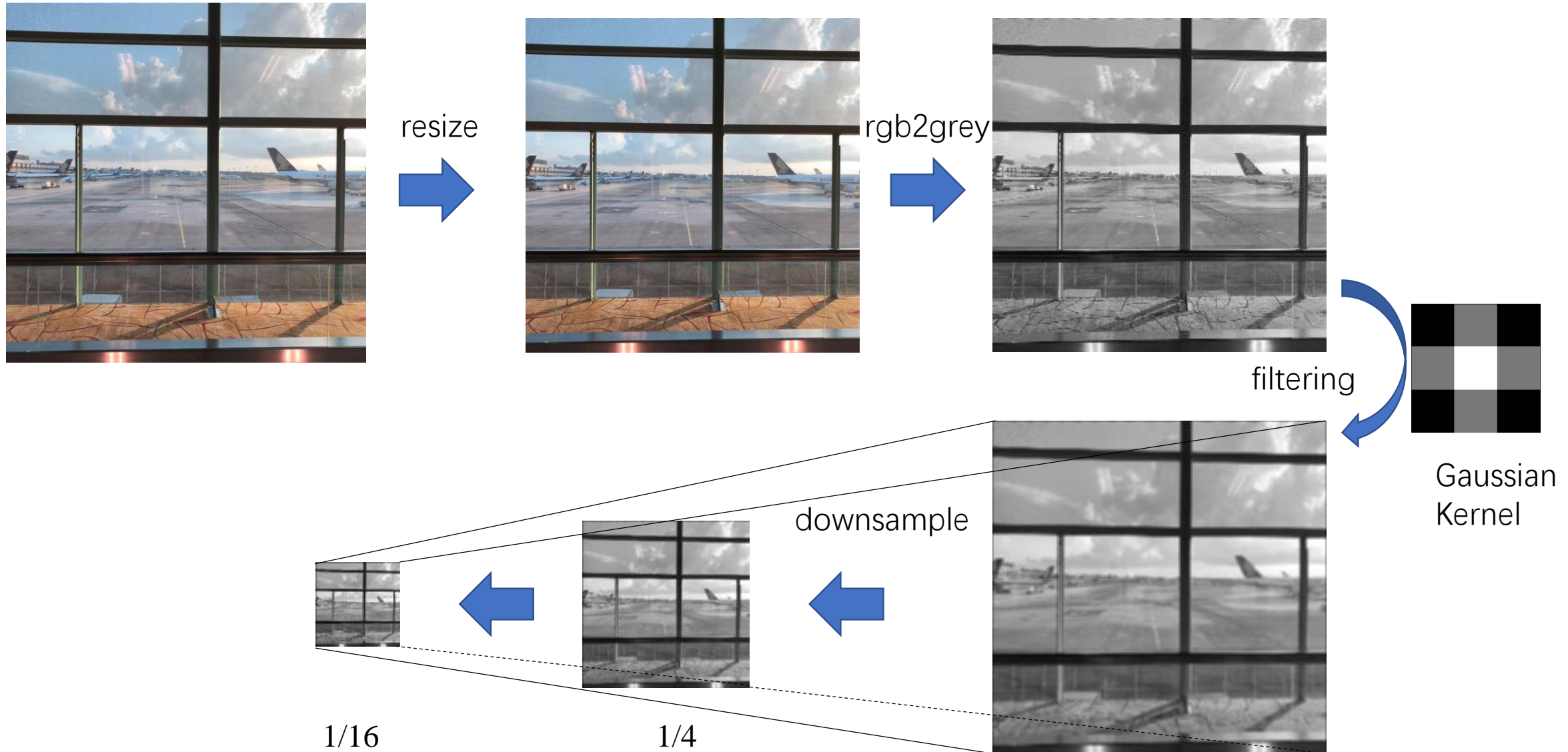
```
[I 10:55:06.624 NotebookApp] The Jupyter Notebook is running at:  
[I 10:55:06.624 NotebookApp] http://127.0.0.1:8889/?token=efccff52f9faab35d37b342de7f7882d243fd6007cffe11  
[I 10:55:06.624 NotebookApp] or http://127.0.0.1:8889/?token=efccff52f9faab35d37b342de7f7882d243fd6007cffe11  
[I 10:55:06.624 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).  
[C 10:55:06.728 NotebookApp]  
  
To access the notebook, open this file in a browser:  
file:///C:/Users/Junbin/AppData/Roaming/jupyter/runtime/nbsrvr-10592-open.html  
Or copy and paste one of these URLs:  
http://127.0.0.1:8889/?token=efccff52f9faab35d37b342de7f7882d243fd6007cffe11  
or http://127.0.0.1:8889/?token=efccff52f9faab35d37b342de7f7882d243fd6007cffe11  
[I 11:01:30.390 NotebookApp] 302 GET /?token=efccff52f9faab35d37b342de7f7882d243fd6007cffe11 (127.0.0.1) 1.04ms
```


Demo

- read/show/save image.
- resize/rescale/rotate
- rgb2grey
- Image filtering

Exercise

Build a simple “Gaussian Spatial Pyramid” for image.



- **Q&A**

Join the slack with your (u.nus.edu) email for free question and instant feedback:

<https://join.slack.com/t/cs4243cvpr/signup>

