

102-1 生物資訊程式設計

Bioinformatics Programming

2013

Cho-Yi Chen

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生物資訊程式設計 2013

2

- 學分數：2
- 時間：
週二, 週四, 上午10~12 下午 2~4
- 地點：圖資大樓401
- 授課系級：生物醫學資訊所
- 授課教師：
黃宣誠(下午)、鍾翊方(上午)
- 課程內容：主要為 R, Python
與 Perl 程式語言及生物資訊分
析程式實作
- 選修要求：具備初級程式設計
能力及基本生物資訊知識，建
議曾修習過程式設計及生物資
訊相關課程的學生選修
- 助教資訊：(Python) 陳卓逸、
(Perl) 許家郎

Huang's Computational Systems Biology Laboratory
Understanding Biology Through Computational Analysis of Biological Networks

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- 助教資訊：(Python) 陳卓逸 ntu.joey@gmail.com (Perl) 許家郎 auymle@gmail.com
- Course Web Site: <http://rosalind.info/classes/68/>
- Python Tutorials: <http://u.csie.org/BioProg2012>
- Python vs R: [python.vs.r.pdf \(beta 0.1\)](#)

What's New

- The first class is scheduled for Tuesday July 16th.
- Slides for 7/16 [130216.intro.pdf](#)

bp_2013/start.txt · Last modified: 2013/07/07 02:54 by Cho-Yi Chen [Back to top](#)

<http://u.csie.org/BioProg2013>

Python Tutorials

Python 程式語言教學
請參考去年課程內容

<http://u.csie.org/BioProg2012>

官方教學文件

<http://docs.python.org/2/tutorial/>

Python Quick Reference Card

<http://perso.limsi.fr/pointal/python:pqrc> (Python 2.4)

<http://rgruet.free.fr/PQR27/PQR2.7.html> (Python 2.7)

Bioinformatics Programming 2012

[課程內容](#) | [作業範例](#) | [作業上傳](#) | [聯絡助教](#)

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WHAT'S NEW

新增各組上傳的 Final Project 報告投影片於作業範例區，歡迎互相觀摩 --- 2012/08/08

[Poll results: Top languages for analytics/data mining programming](#) --- 2012/08/02

今天的課程因颱風假取消，下星期二下午依原訂進度進行期末報告 --- 2012/08/02

新增 7/31 上課投影片 --- 2012/07/30

新增 7/26 上課投影片 --- 2012/07/26

新增 7/24 上課投影片 --- 2012/07/24

新增 hw4 測資 <hw4.9606.tsv> 於作業範例區 --- 2012/07/21

更新 hw4 FAQ --- 2012/07/21

新增 7/19 上課投影片 --- 2012/07/19

下次上課將回到 R401 電腦教室 --- 2012/07/17

hw4 繳交期限延到下週二(7/24)早上9:00 --- 2012/07/17

新增 7/17 上課投影片 --- 2012/07/17

更新 hw3 FAQ --- 2012/07/15

新增 hw2, hw3, hw4 FAQ --- 2012/07/14

新增 7/12 上課投影片 --- 2012/07/12

新增 7/10 上課投影片 --- 2012/07/10

The first class is scheduled for Tuesday July 10th at 2pm. --- 2012/07/10

FAQ

Homework 2

Q: 真的有可能只用一行程式碼就完成作業二嗎?

A: 千真萬確。基於美觀與排版需要，可以使用反斜線(backslash)作為行接續(see [PEP 8 -- Style Guide for Python Code](#))，但不得使用分號(semicolon)連接多個敘述(statements)。另外，直接將表格寫在程式碼中直接印出也是不被允許的。 --- 2012/07/14

Homework 3

Q: 名次相同的選手，其姓名的 lexical order 是以 LastName 為主還是以 FirstName 為主?

A: 名次相同的選手其姓名的 lexical order 自然是依照 output format 的順序: LastName, FirstName, and so on. 也就是先依 LastName 再

Enthought Canopy

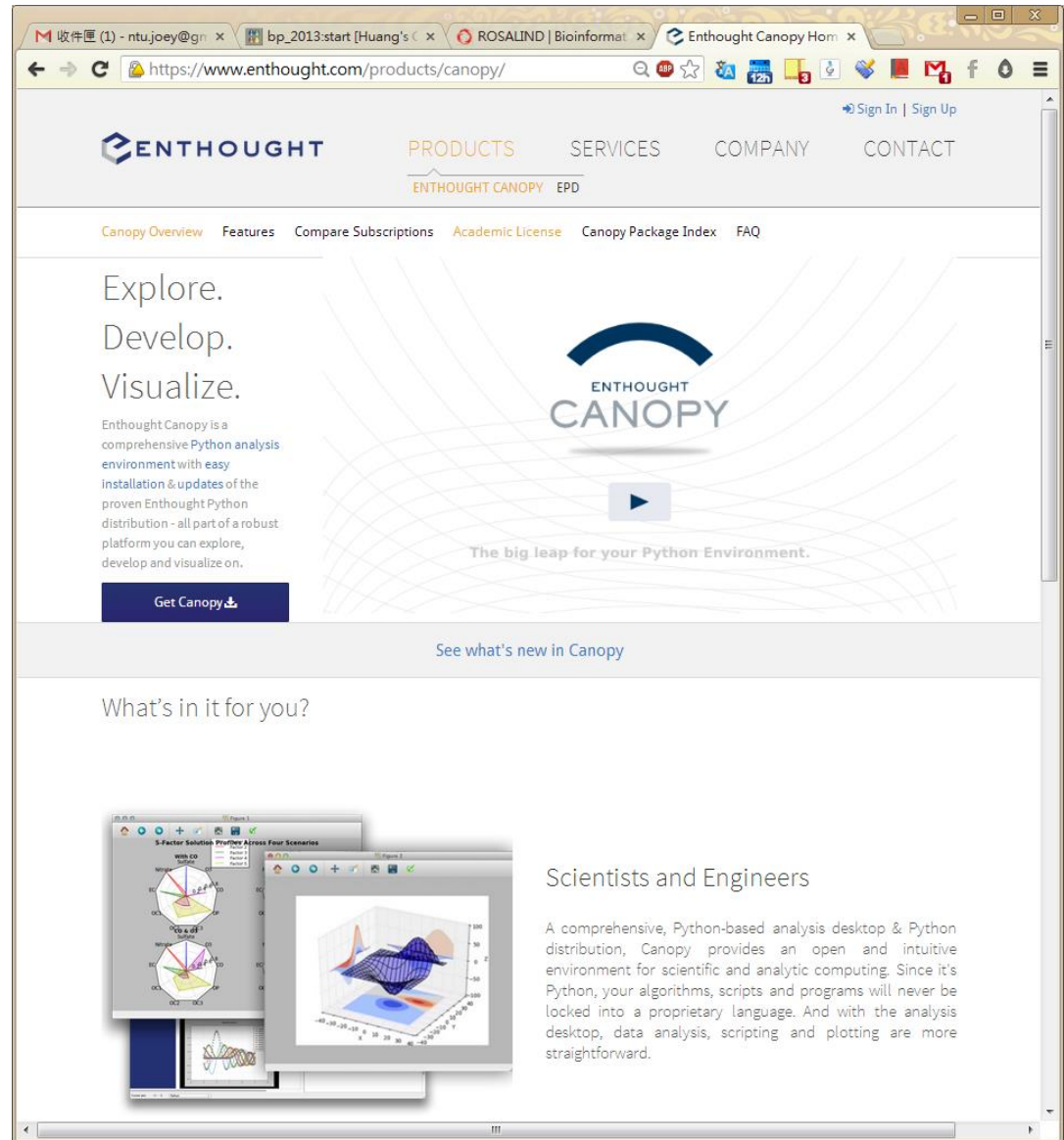
Install Python analysis environment

Enthought Canopy

Enthought Canopy is a comprehensive Python analysis environment

It includes a Python distribution with **over 100 packages** to install

The analysis environment features an **editor, package manager, and document browser**



The screenshot shows the Enthought Canopy website. The browser address bar displays <https://www.enthought.com/products/canopy/>. The website header includes the Enthought logo and navigation links for PRODUCTS, SERVICES, COMPANY, and CONTACT. Below the header, there are sub-links for ENTHOUGHT CANOPY and EPD. The main content area features a large banner with the text "Explore. Develop. Visualize." and the Enthought Canopy logo. A play button icon is centered on the banner, with the tagline "The big leap for your Python Environment." below it. A "Get Canopy" button is visible on the left side of the banner. Below the banner, there is a link "See what's new in Canopy". The section "What's in it for you?" includes images of software interfaces showing data analysis results, such as a 3D surface plot and a 2D plot.

Scientists and Engineers

A comprehensive, Python-based analysis desktop & Python distribution, Canopy provides an open and intuitive environment for scientific and analytic computing. Since it's Python, your algorithms, scripts and programs will never be locked into a proprietary language. And with the analysis desktop, data analysis, scripting and plotting are more straightforward.

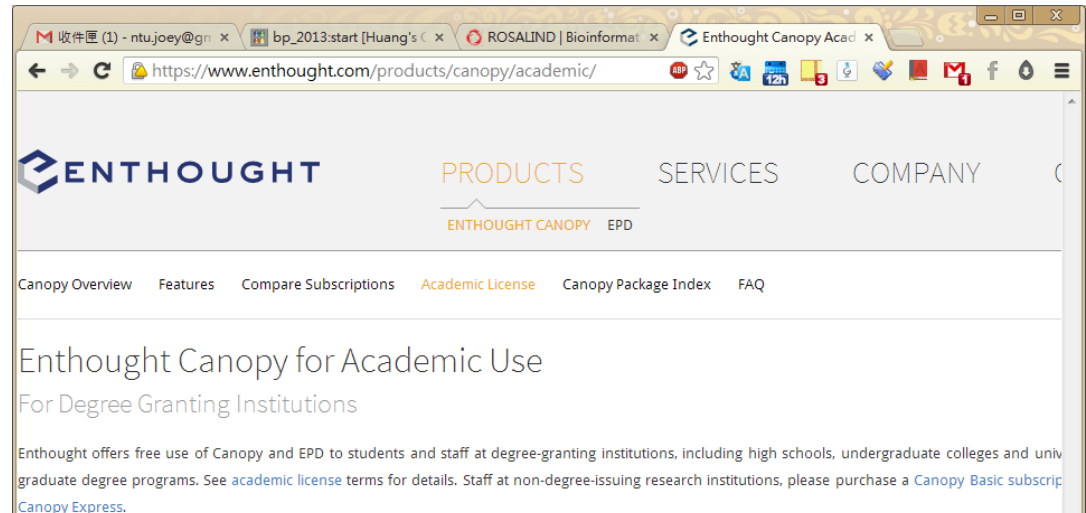
<https://www.enthought.com/products/canopy/>

Request your Academic License

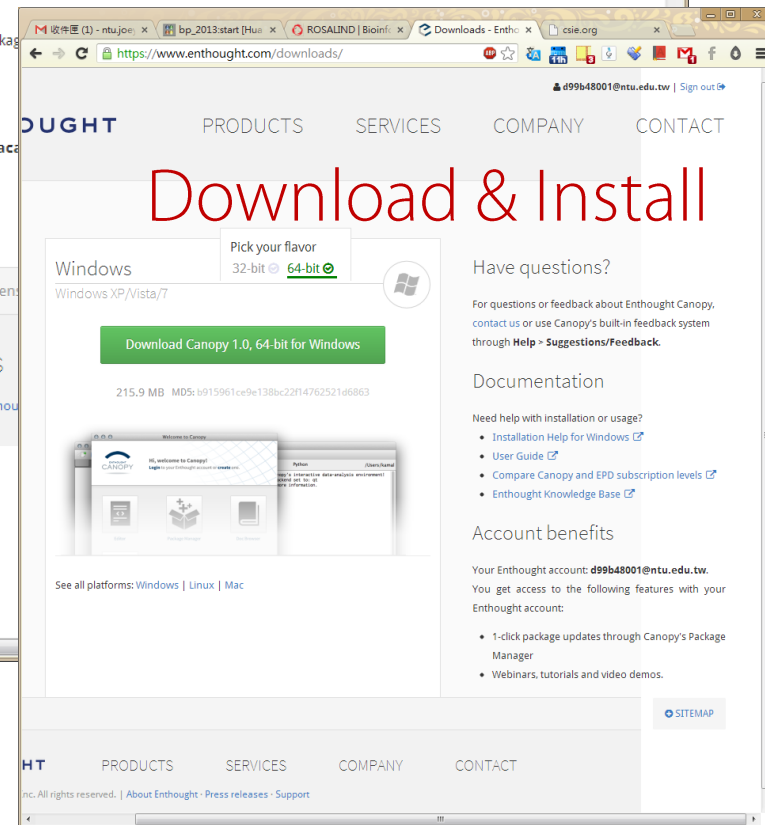
Students at Degree-Granting Institutions can get an academic License with their **edu** email address

If you don't have one, try Canopy Express instead

Select your platform & start the download



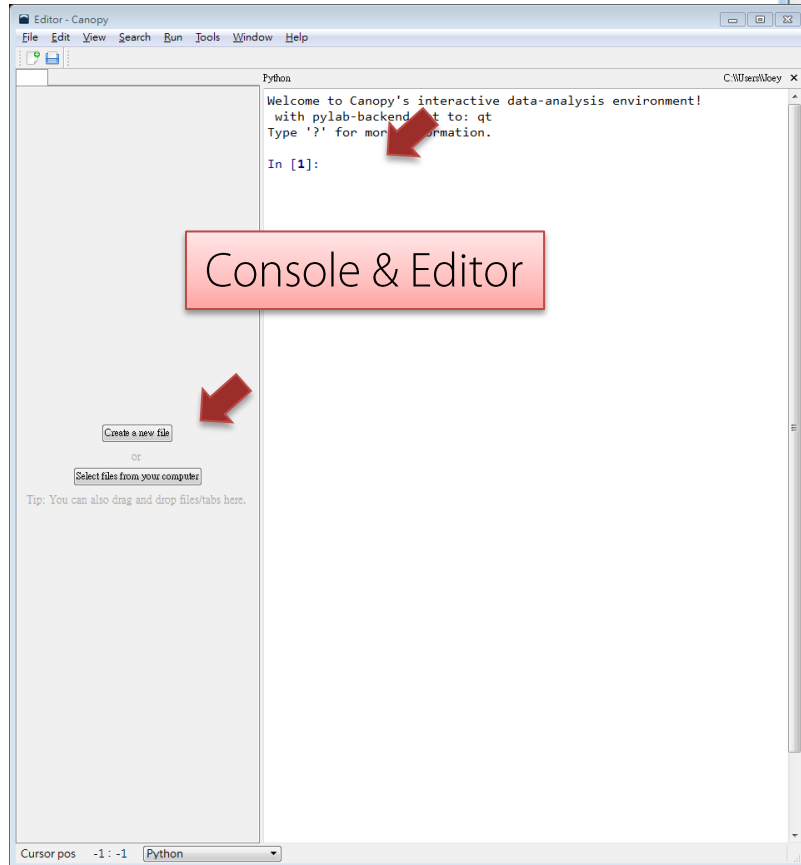
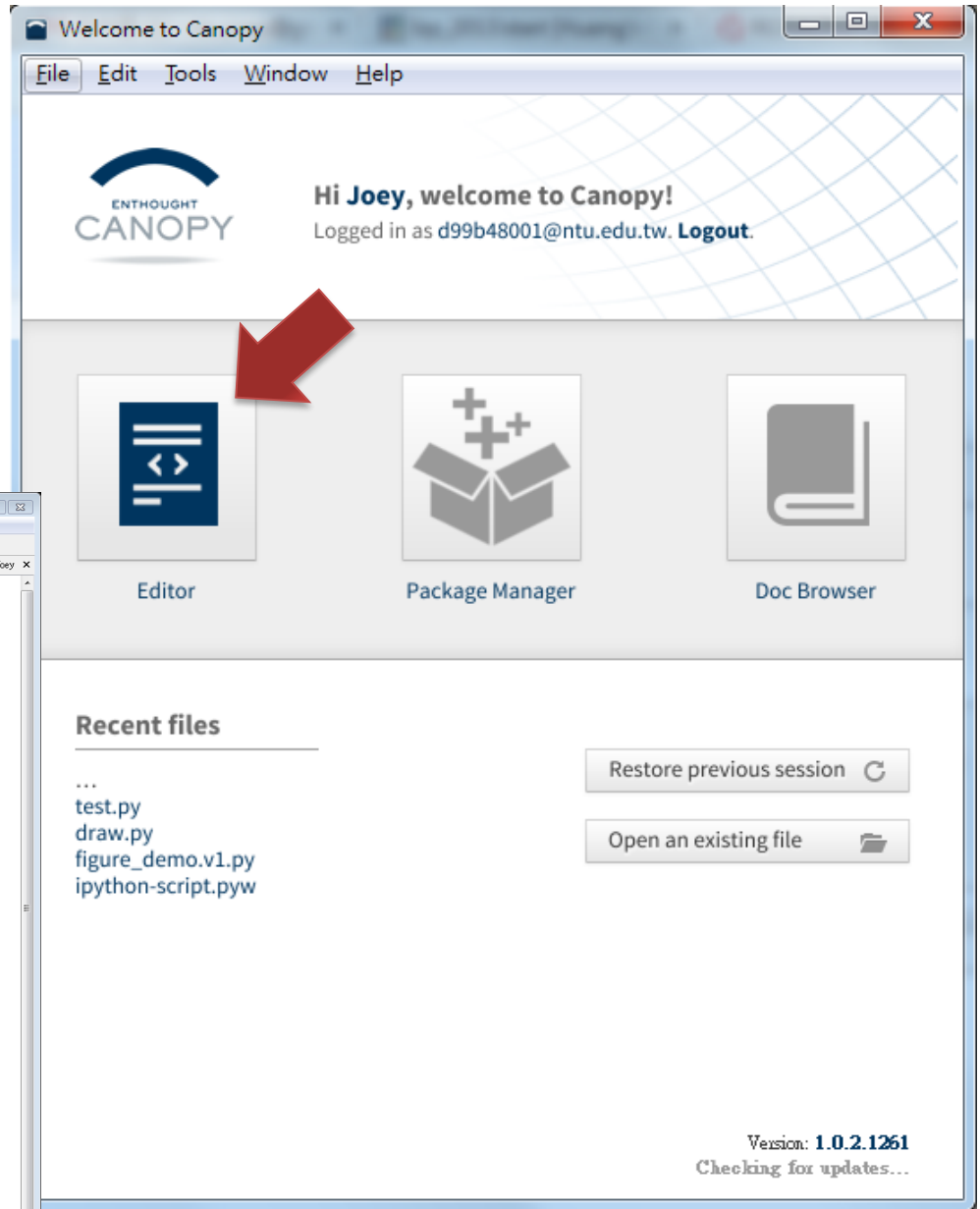
The screenshot shows the Enthought website's 'Academic License' page. The URL is <https://www.enthought.com/products/canopy/academic/>. The page title is 'Enthought Canopy for Academic Use For Degree Granting Institutions'. It explains that Enthought offers free use of Canopy and EPD to students and staff at degree-granting institutions. A yellow box highlights the 'Request your Academic License' link, with a red arrow pointing to it.



The screenshot shows the Enthought website's 'Downloads' page. The URL is <https://www.enthought.com/downloads/>. The page title is 'Download & Install'. It offers a 'Pick your flavor' dropdown menu with options for '32-bit' and '64-bit'. A green button labeled 'Download Canopy 1.0, 64-bit for Windows' is visible. Below the button, the file size is listed as '215.9 MB' and the MD5 hash is 'b915961ce9e138bc22f14762521d6863'. There is also a 'Have questions?' section with links to 'Installation Help for Windows', 'User Guide', 'Compare Canopy and EPD subscription levels', and 'Enthought Knowledge Base'. The footer includes 'HT PRODUCTS SERVICES COMPANY CONTACT' and 'nc. All rights reserved. | About Enthought · Press releases · Support'.

Start Canopy

Happy Programming!



Console & Editor

ROSALIND

Online-judgment system

Couse Website

Now you can access our course website & start to solve the problem list

WARNING

Do not click on “**Leave**” button unless you are REALLY sure about dropping the course!



The screenshot shows a web browser window with the URL rosalind.info/classes/68/. The page features the Rosalind logo and the course title "Bioinformatics Programming 2013". A red hand icon with a stop sign is overlaid on the "Leave" button, with a red arrow pointing to it. Below the title, there are buttons for "Print all problems", "Announcements", "All classes", and "Leave". The course is by Hsuan-Cheng Huang at National Yang-Ming University. A list of course details is provided, including credits, schedule, location, and instructor. A "What's New" section states the first class is on Tuesday, July 16th. A table lists the course topics, XP, cost, due dates, and solution availability.

Num	Title	XP	Cost	Due Date	Questions	Solutions
1	Installing Python	0	1	七月 17, 2013	🗨	
2	Variables and Some Arithmetic	0	1	七月 17, 2013	🗨	
3	Strings and Lists	0	1	七月 17, 2013	🗨	
4	Conditions and Loops	0	1	七月 17, 2013	🗨	
5	Working with Files	0	1	七月 17, 2013	🗨	
6	Dictionaries	0	1	七月 17, 2013	🗨	
7	Counting DNA Nucleotides	0	1	七月 18, 2013	🗨	
8	Transcribing DNA into RNA	0	1	七月 19, 2013	🗨	

Exercise 1: Installing Python

Read the background
knowledge & the
problem information



The screenshot shows a web browser window with the URL `rosalind.info/problems/ini1/?class=68`. The page title is "Installing Python" and the subtitle is "Problem 1 @ Bioinformatics Programming 2013". The page is dated "十二月 8, 2012, 2:42 a.m. by Rosalind Team" and has topics "Introductory Exercises, Programming". A large red arrow points to the "Why Python?" section, which is currently collapsed. The "Why Python?" section contains the following text:

Why Python? click to collapse

Rosalind problems can be solved using any programming language. Our language of choice is **Python**. Why? Because it's simple, powerful, and even funny. You'll see what we mean.

If you don't already have **Python** software, please [download and install the appropriate version for your platform](#) (Windows, Linux or Mac OS X). Please install **Python** of version 2.x (not 3.x) — it has more libraries support and many well-written guides.

After completing installation, launch **IDLE** (default **Python** development environment; it's usually installed with **Python**, however you may need to install it separately on Linux).

You'll see a window containing three arrows, like so:

```
>>>
```

The three arrows are **Python's** way of saying that it is ready to serve you every need. You are in interactive mode, meaning that any command you type will run immediately. Try typing `1+1` and see what happens.

Of course, to become a Rosalind pro, you will need to write programs having more than one line. So select **File** → **New Window** from the **IDLE** menu. You can now type code as you would into a text editor. For example, type the following:

```
print "Hello, World!"
```

Select **File** → **Save** to save your creation with an appropriate name (e.g., `hello.py`).

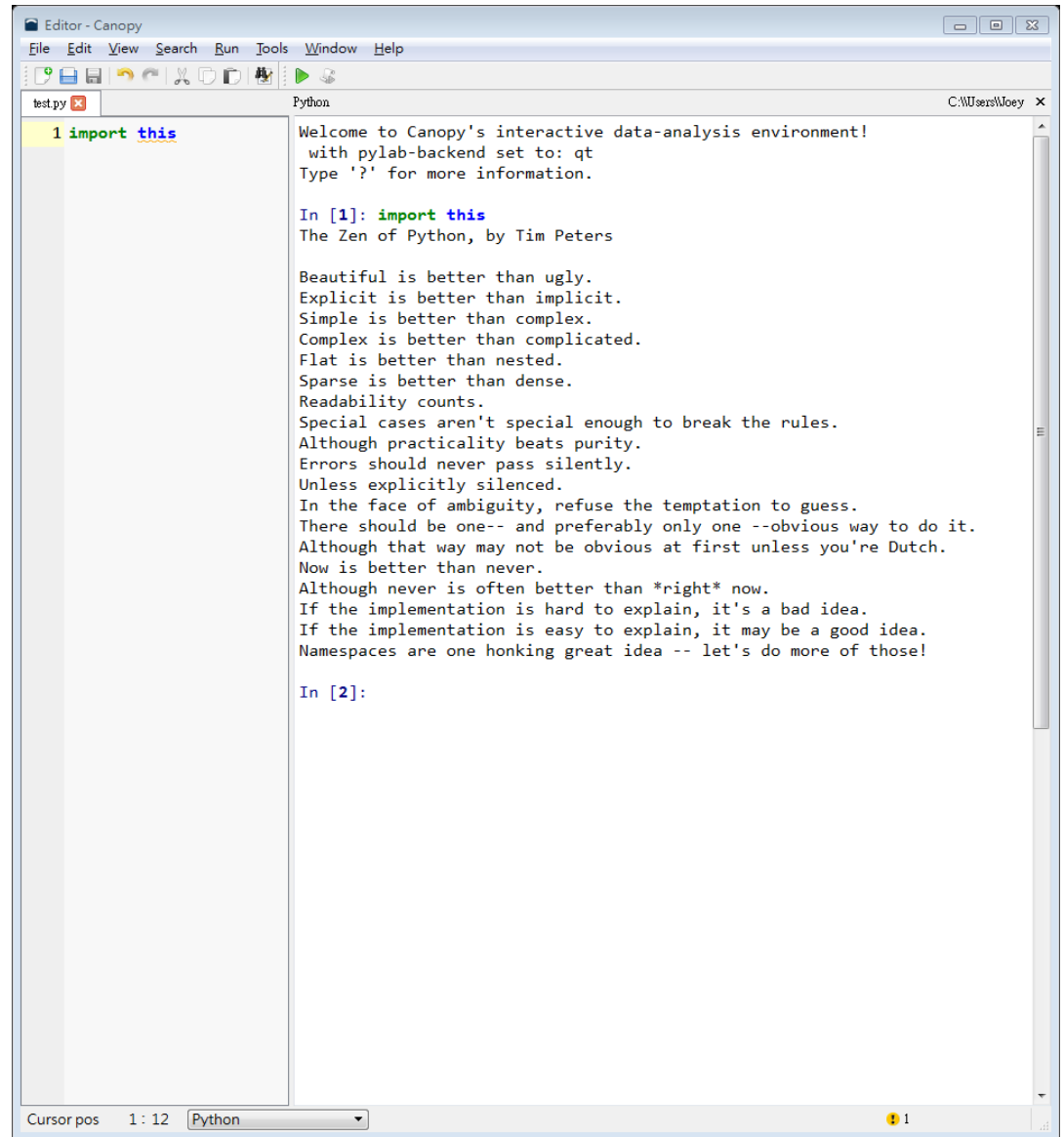
To run your program, select **Run** → **Run Module**. You'll see the result in the interactive mode window (**Python Shell**).

Congratulations! You just ran your first program in **Python**!

A vertical "Feedback" button is visible on the right side of the page.

Start Programming

Start up your Canopy
and have fun



```
Editor - Canopy
File Edit View Search Run Tools Window Help
test.py Python C:\Users\Woey
1 import this
Welcome to Canopy's interactive data-analysis environment!
with pylab-backend set to: qt
Type '?' for more information.

In [1]: import this
The Zen of Python, by Tim Peters

Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.
Special cases aren't special enough to break the rules.
Although practicality beats purity.
Errors should never pass silently.
Unless explicitly silenced.
In the face of ambiguity, refuse the temptation to guess.
There should be one-- and preferably only one --obvious way to do it.
Although that way may not be obvious at first unless you're Dutch.
Now is better than never.
Although never is often better than *right* now.
If the implementation is hard to explain, it's a bad idea.
If the implementation is easy to explain, it may be a good idea.
Namespaces are one honking great idea -- let's do more of those!

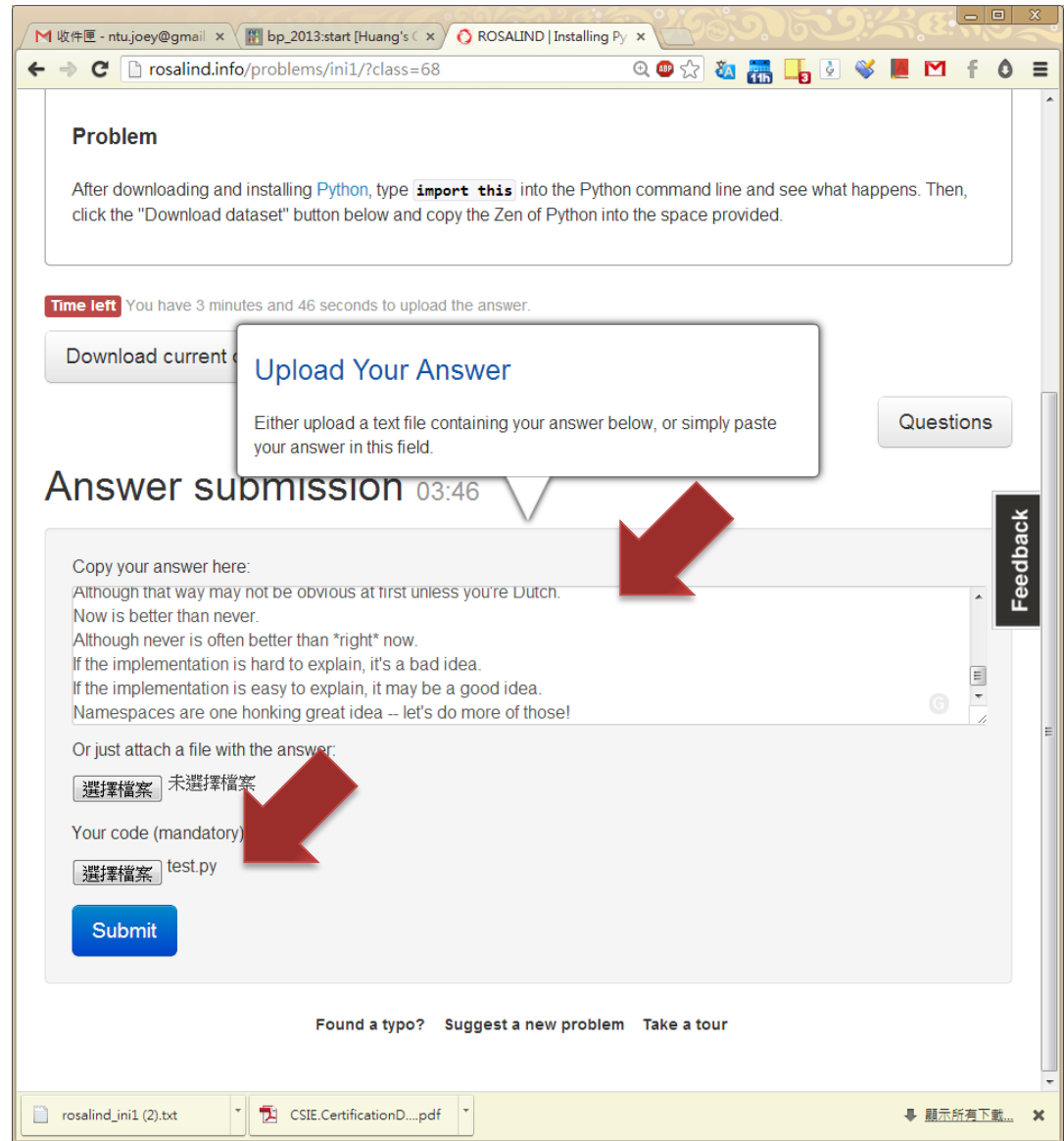
In [2]:
```

Cursor pos 1 : 12 Python 1

Submit your answer

You may also ask a question by clicking on the **“Questions”** button

Finally, download the problem dataset and submit your **answer output & source code**



Judgments

You may see the judgment results after a while

If you don't get admitted, just try again later

rosalind.info/problems/ini1/?class=68

Installing Python

Problem 1 @ Bioinformatics Programming 2013

十二月 8, 2012, 2:42 a.m. by Rosalind Team

Topics: [Introductory Exercises](#), [Programming](#)

Why Python? [click to expand](#)

Problem

After downloading and installing [Python](#), type `import this` into the Python command line and see what happens. Then, click the "Download dataset" button below and copy the Zen of Python into the space provided.

Please wait You may make another attempt in 32 seconds.

Congratulations You solved this problem (attempt #2).

[Questions](#) [Solutions](#) [Explanation](#)

Attempts

#	Begin Time	Submit Time	Result	Dataset	Submission	Code
1	七月 6, 2013, 10:21 p.m.	—	Time out	⊕	—	—
2	七月 7, 2013, 1:13 a.m.	七月 7, 2013, 1:14 a.m.	Correct	⊕	⊕	⊕

[Found a typo?](#) [Suggest a new problem](#) [Take a tour](#)

rosalind_ini1 (2).txt CSIE.CertificationD...pdf 顯示所有下載...

Updated Status

You've earned a XP point

Go on & challenge next one!



The screenshot shows a web browser window displaying the ROSALIND website. The page title is "Bioinformatics Programming 2013" with a sub-header "solved 1 of 9". The course is by Hsuan-Cheng Huang at National Yang-Ming University. The page lists course details such as credit hours, schedule, location, and instructor. Below this is a "What's New" section stating the first class is on Tuesday, July 16th. A table lists the course problems with columns for Num, Title, XP, Cost, Due Date, Questions, and Solutions. The first problem, "Installing Python", is highlighted in green and shows 1 XP earned. The browser's taskbar at the bottom shows two open files: "rosalind_ini1 (2).txt" and "CSIE.CertificationD...pdf".

ROSALIND

Bioinformatics Programming 2013 solved 1 of 9

[Print all problems](#) [Announcements](#) [All classes](#) [Leave](#)

by Hsuan-Cheng Huang at National Yang-Ming University

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