

102-1 生物資訊程式設計

Bioinformatics Programming 2013

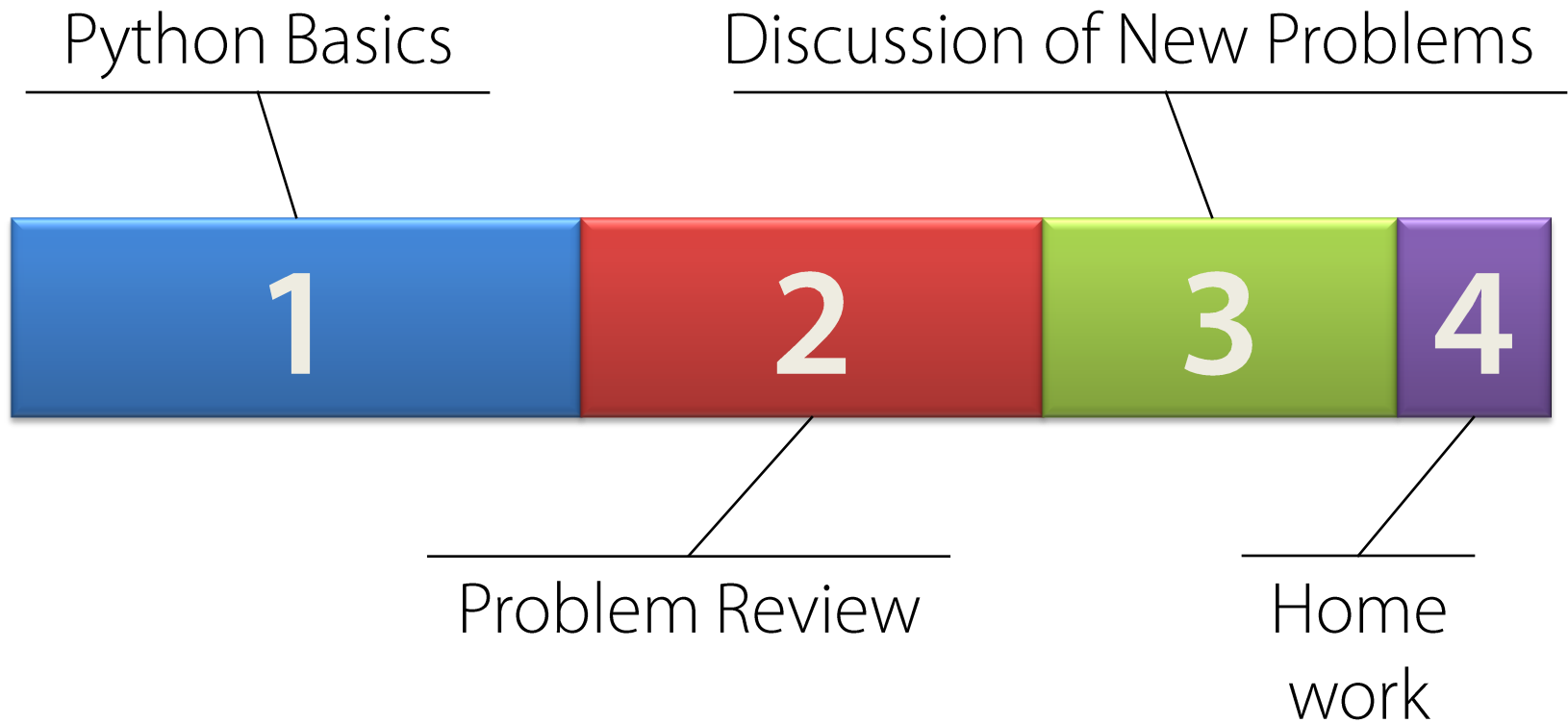
07/18

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Outline





Tips for Canopy

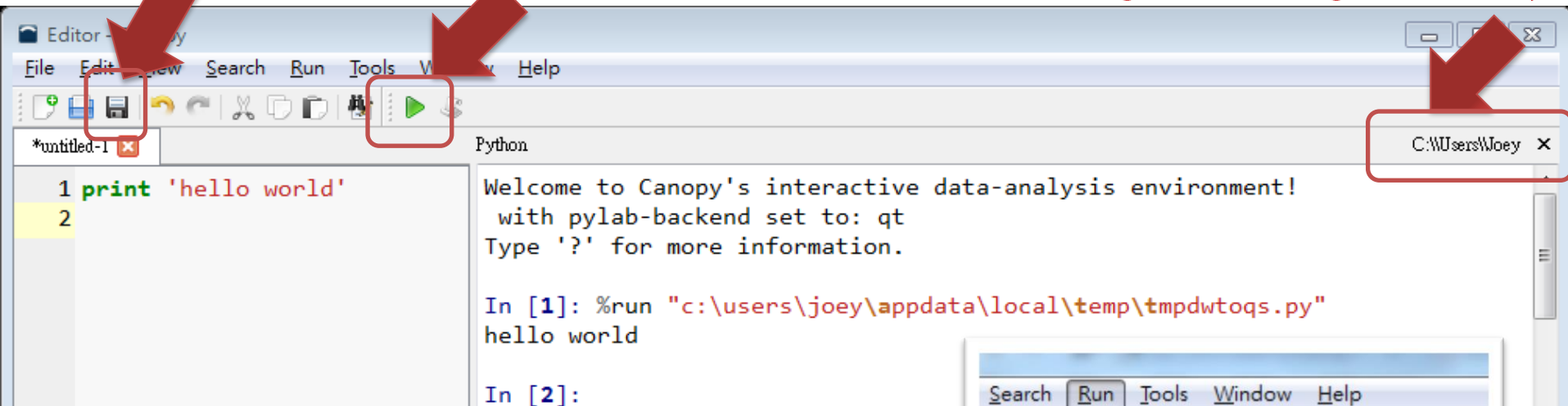
Tips for Canopy

4

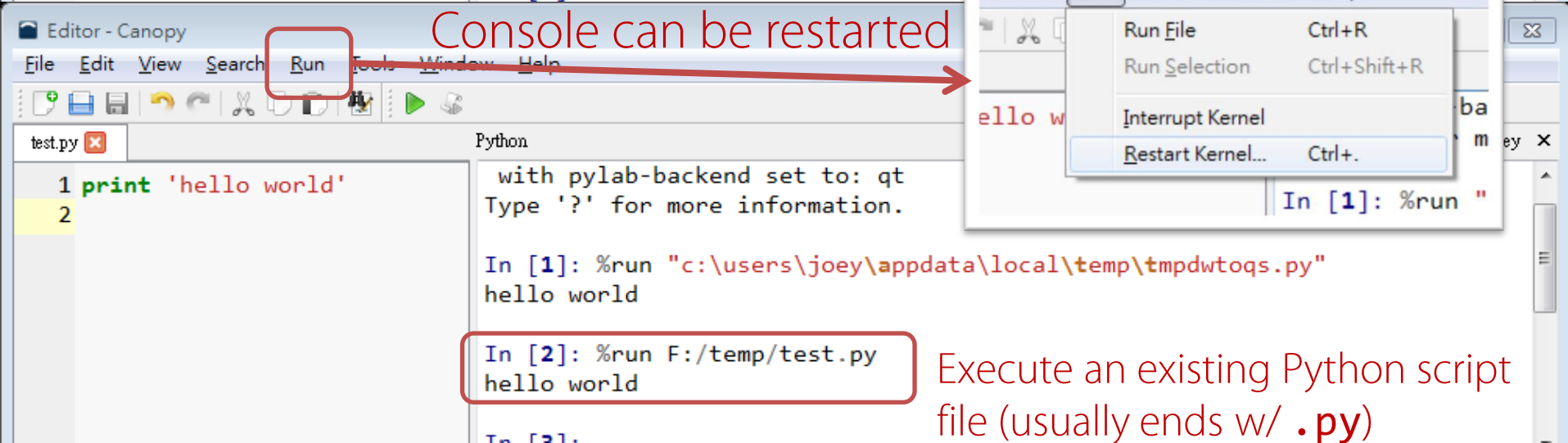
Save the file (Ctrl-S)

Run the file (Ctrl-R)

Change working directory



Console can be restarted



Execute an existing Python script file (usually ends w/ .py)

Tips for the Canopy console (iPython)

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```
In [2]: pwd
Out[2]: u'C:\\Users\\Joey'
```

```
In [3]: cd ..      File system Operation
C:\\Users
```

```
In [4]: cd ..
C:\\
```

```
In [5]: ls
磁碟區 C 中的磁碟沒有標籤。
磁碟區序號: 3801-115E
```

C:\ 的目錄

2013/06/18	上午 10:57	<DIR>	
2013/03/09	下午 04:02	<DIR>	
2009/07/14	上午 11:20	<DIR>	
2013/04/17	下午 05:05	<DIR>	Perl
2013/06/27	上午 10:14	<DIR>	Program Files
2013/07/14	下午 08:49	<DIR>	Program Files (x86)
2013/05/02	下午 04:12	<DIR>	Python27
2013/03/08	上午 12:12	<DIR>	Users
2013/06/21	上午 10:33	<DIR>	Windows
	0 個檔案		0 位元組
	9 個目錄		71,477,035,008 位元組可用

```
In [6]: |
```

```
In [9]: range?
Type:      builtin_function_or_method
String Form:<built-in function range>
Namespace: Python builtin
Docstring:
range([start,] stop[, step]) -> list of integers
```

Return a list containing an arithmetic progression of integers.
range(i, j) returns [i, i+1, i+2, ..., j-1]; start (!) defaults to 0.
When step is given, it specifies the increment (or decrement).
For example, range(4) returns [0, 1, 2, 3]. The end point is omitted!
These are exactly the valid indices for a list of 4 elements.

Looking for documents

Open the file in Editor

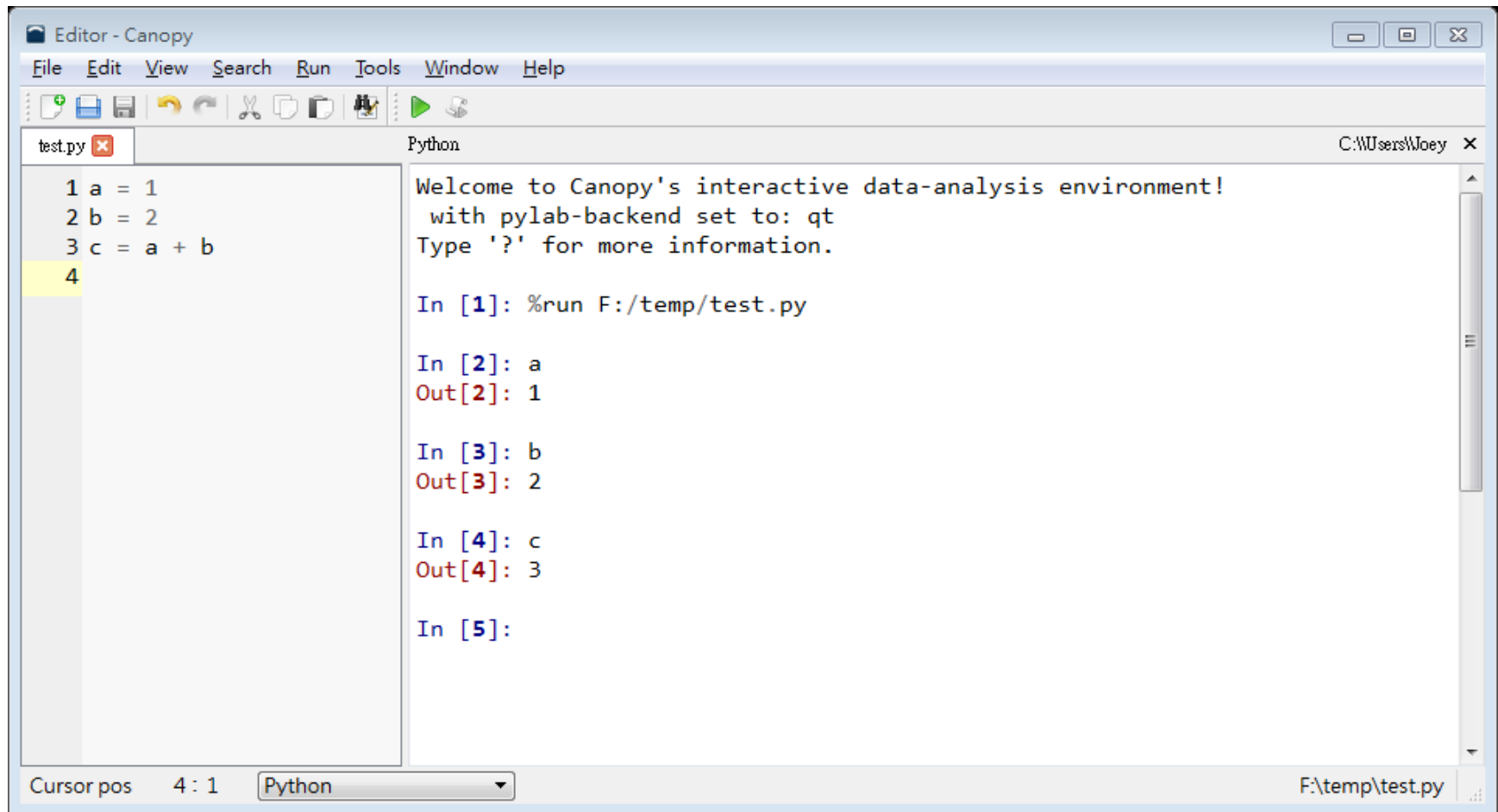
```
In [13]: edit test.py
```

```
In [14]: ed test.py
```

```
In [15]: ?
```

Tips for runtime debugging

6



The screenshot shows the Canopy Python editor interface. The left pane contains a Python script named 'test.py' with the following code:

```
1 a = 1
2 b = 2
3 c = a + b
4
```

The right pane shows the execution output:

```
Welcome to Canopy's interactive data-analysis environment!
with pylab-backend set to: qt
Type '?' for more information.

In [1]: %run F:/temp/test.py

In [2]: a
Out[2]: 1

In [3]: b
Out[3]: 2

In [4]: c
Out[4]: 3

In [5]:
```

The status bar at the bottom indicates the cursor position is at line 4, column 1, and the file path is F:\temp\test.py.

Tips for Rosalind

Working with Files

Make sure you know the file path of the download dataset

Copy the downloaded dataset to your working directory

Or specify the full path when you open the downloaded file

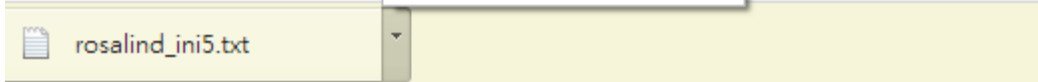
Download current dataset again

Answer submission

Copy your answer here:

- 開啟(O)
- 永遠開啟這類檔案(A)
- 在資料夾中顯示(S)
- 取消(C)

with the answer:



Answer submission 00:42

Copy your answer here:

**Copy & paste your answer here
Or upload your answer txt file**

Or just attach a file with the answer:

選擇檔案 未選擇檔案

Your code (mandatory):

選擇檔案 未選擇檔案

Submit

Don't forget your code

Looking for help?

A recurrence relation is a way of defining the terms of a sequence with respect to the values of previous terms. In the case of Fibonacci's rabbits from the introduction, any given month will contain the rabbits that were alive the previous month, plus any new offspring. A key observation is that the number of offspring in any month is equal to the number of rabbits that were alive two months prior. As a result, if F_n represents the number of rabbit pairs alive after the n -th month, then we obtain the **Fibonacci sequence** having terms F_n that are defined by the recurrence relation $F_n = F_{n-1} + F_{n-2}$ (with $F_1 = F_2 = 1$ to initiate the sequence). Although the sequence bears Fibonacci's name, it was known to Indian mathematicians over two millennia ago.

When finding the n -th term of a sequence defined by a recurrence relation, we can simply use the recurrence relation to generate terms for progressively larger values of n . This problem introduces us to the computational technique of **dynamic programming**, which successively builds up solutions by using the answers to smaller cases.

Given: Positive integers $n \leq 40$ and $k \leq 5$.

Return: The total number of rabbit pairs that will be present after n months if each pair of reproduction-age rabbits produces a litter of k rabbit pairs in each generation (instead of only 1 pair).

Sample Dataset

5 3

Sample Output

19

Time limit You'll have 5 minutes to upload the answer.

Download dataset You may make an unlimited number of attempts without being penalized.

Post your question here

Questions

ROSALIND

Questions

Votes Newest

Problem 10 @ Bioinformatics Programming 2013

Do not publish any answers or solutions in the questions forum. All inappropriate comments will be deleted without notice.

Please do the following before posting a question here:

- (1) Make sure that you are using the latest downloaded dataset each time you submit an answer.
- (2) If your solution works on the sample dataset, but fails on a real one, create some more samples to test it.
- (3) If you are sure that your solution is correct, carefully read the statement again.

Bro.Gunpow Sample Output =19? if F1=3 -> F2=3 -> F3=6 -> F4=9 -> F5=15 是不是我哪裡搞錯了?
七月 17, 2013, 4:02 p.m.
reply

hchuang 這題比較難, 不過的確是 19 沒錯。別忘了兔子需要 1 個月的成熟期。問題真的 Figure 1 可以多研究一下。
七月 17, 2013, 5:03 p.m.
edit delete reply

hchuang 這題比較難, 不過的確是 19 沒錯。別忘了兔子需要 1 個月的成熟期。問題真的 Figure 1 可以多研究一下。
七月 17, 2013, 5:03 p.m.
edit delete reply

Comment:

You are welcome to discuss online But DON'T leak the solution

Q&A

Example solutions will be provided after the deadline

We will also review the problems in the next class

In general, we will assign more problems in Thursday

It's fine to miss a class, but you should catch up our progress before next class

ROSALIND

Bioinformatics Programming 2013

Edit class info Edit problems Enroll link Grade sheet Assistants Print all problems Announcements

All classes Delete

by Hsuan-Cheng Huang at National Yang-Ming University

- 時間：週二、週四、上午10:12 下午 24
- 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)
- 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
- 進修要求：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 ntu.joey@gmail.com (Perl) 許家郎 auymle@gmail.com
- 課程網站：<http://u.csie.org/BioProg2013>

What's New

The first class is scheduled for Tuesday July 16th.

Num	Title	Solved By	Cost	Due Date	Questions	Solutions
1	Installing Python	23	1	七月 18, 2013	1天, 2小時	16小時, 30分鐘
2	Variables and Some Arithmetic	24	1	七月 18, 2013		16小時
3	Strings and Lists	24	1	七月 18, 2013	1天, 1小時	15小時, 50分鐘
4	Conditions and Loops	23	1	七月 18, 2013		
5	Working with Files	20	1	七月 18, 2013		
6	Dictionaries	7	1	七月 23, 2013		
7	Counting DNA Nucleotides	3	1	七月 23, 2013		
8	Transcribing DNA into RNA	3	1	七月 23, 2013		
9	Complementing a Strand of DNA	3	1	七月 23, 2013		
10	Rabbits and Recurrence Relations	0	1	七月 23, 2013	7分鐘	
11	Computing GC Content	0	1	七月 23, 2013		

Feedback