Introduction to Programming

Python Lab 1:
My First Program

PythonLab1 lecture slides.ppt

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Module Information

Lecturer: Steve Maybank

Afternoon Lectures: MAL 421, 14.00-15.20

Evening Lectures: UCL Torrington Place 1-19, Room G13, 18.00 – 19.20

Laboratories: ITS MAL 109 (both sessions)

Note: Laboratory classes are designed to reinforce the materials covered in the lectures.

Module materials: https://www.dcs.bbk.ac.uk/~sjmaybank/

Getting Started

- Create a new folder in your disk space with the name **PythonLab1**

- Launch the Python Integrated Development Environment (**IDLE**) - begin with the **Start** icon in the lower left corner of the screen.

- If you are in a DCSIS laboratory, search using the keyword **Python** and click on **IDLE (Python 3.6 64-bit)** .

  A window with the title **Python 3.6.2 Shell** should appear. This window is the *Shell*.

Getting Started (2)

- If you are in the ITS laboratory MAL 109, then right mouse click on the **Start** icon in the lower left corner of the screen.

  A list of menu options should appear and click on **Search**. Type **Python** in the search text box at the bottom of the pop-up window. A list of Apps should appear and select

  Python 3.4 IDLE(PythonGUI)

  A window with the title **Python 3.4.3 Shell** should appear. This window is the *Shell*.

- In the *Shell* click on **File.** A drop down menu will appear.

  Click on **New File.** A window with the `title` **Untitled** should appear. This window is the *Editor*.

Getting Started (3)

- In the *Editor*, click on **File**, and then in the drop down menu click on **Save As…** .

  A window showing a list of folders should appear.

  - To search any folder on the list, double click on the folder.

  - Find the folder **PythonLab1** and double click on it.

  - In the box **File name** at the bottom of the window

    1. Type `HelloWorld.py`

    2. Then click on the button **Save** in the lower right corner of the window.

  The title of the *Editor* should change to show the location of the file HelloWorld.py
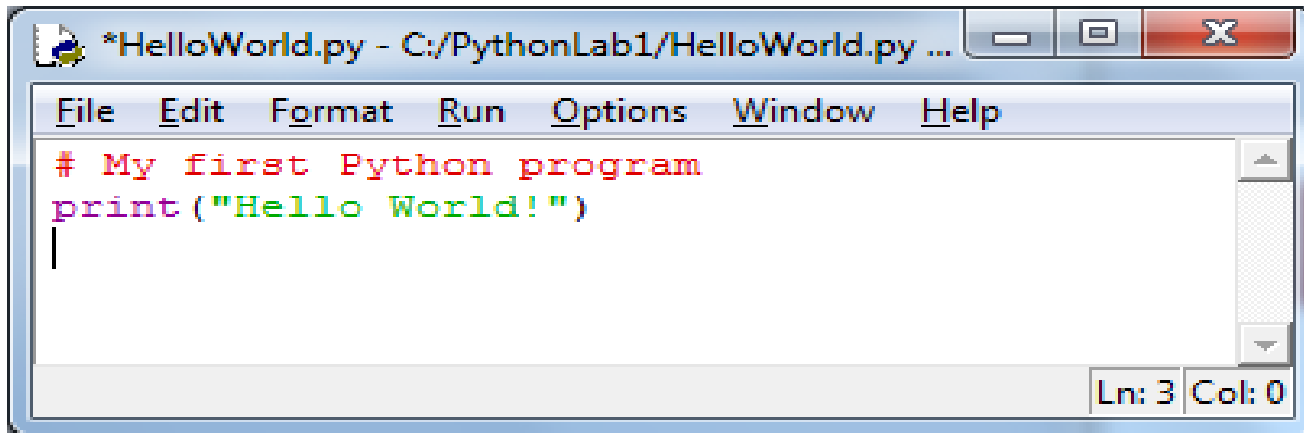
Write and run your first program

- In the *Editor* type

```
# My first Python program
print("Hello World!")
```

left justified and on the first line.

Notice the colour coding: **red** for the comment, **purple** for the function `print()` and **green** for the data `"Hello World!"`.

Note: If you are using any of the ITS PCs, remember to save all your files on your own disk space, **NOT** on the C: drive.
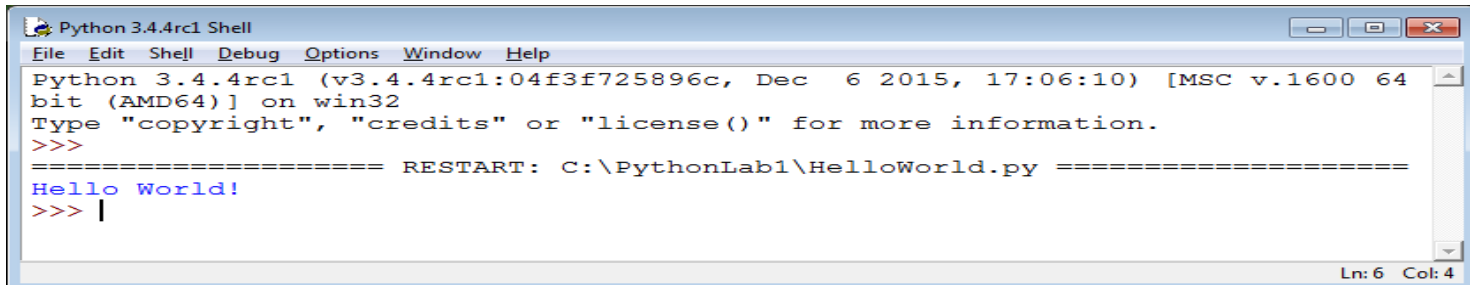
Write and run your first program (2)

- In the *Editor* click on **Run**, then on the drop down menu click on **Run Module**.

  A window will appear with the message **Source Must Be Saved**. Click on **OK**.

  Two things happen:

  1. Your program is saved in the file HelloWorld.py

  2. Then it is run to produce the text `"Hello World!"` in the *Shell* window. The text in the *Shell* is blue to show that it is output. The screenshot below is an example and its content may differ slightly to that in your *Shell* window.

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Exercises on Syntax Errors

1. In the *Editor* type

   ```
   Print(Hello World!)
   ```

   on a new line and <u>left justified</u>. As before, click on **Run Module**. A window will appear. Click on **OK**.

2. In the *Editor* , replace the line

   ```
   Print(Hello, World!)
   ```

   with the line

   ```
   print("Hello World!)
   ```

   and click on **Run Module**. A window will appear.

   Use a web search engine to find out if others have obtained the same error message. Click on **OK**.

   Remove the erroneous statements from the *Editor* or correct them.

Exercises on Print statements

1. What do the following statements print when they are executed together?

```
print("Hello")
print("World!")
```

2. What do the following statements print when they are executed together. **Note the indentation**.

```
print("Hello")
    print("World!")
```

3. What does the following statement print?

```
print("My lucky numbers are", 3*4+5, 5*6-1)
```

4. What is the error in the following statement?

```
print(1/0)
```

Exercise on evaluation of arithmetical expressions

- A bank account contains $10,000 and earns interest at the rate of 5 percent per year. The interest is added to the account. (See PFE Section 1.7).

  After one year the bank account contains the original sum of $10,000 plus the interest, which is 5% of $10,000, namely 10,000 *(5/100). So, the final account balance is

  ```
  10000+10000*(5/100) = 10000*(1+(5/100)) = 10000*1.05
  ```

  (i) Print out the value of 10000*1.05 using the code:

  ```
  print("balance after one year: ", 10000*1.05)
  ```

  (ii) Find the balance of the account after two years using the code:

  ```
  print("balance after two years: ", 10000*1.05*1.05)
  ```

  (iii) Manually work out the number of years it takes for the account balance to be at least double the original balance. Then write code similar to (ii) above to find the account balance after this number of years.

Supplementary Questions for Private Study

- The laboratory worksheet contains supplementary questions 6.1, 6.2, 6.3 and 6.4 for private study.

- You are encouraged to complete the supplementary questions at home, or in the laboratory if you have time after completing exercises 2, 3, 4 and 5.