

The background is a solid blue gradient. In the corners, there are decorative white line art elements resembling circuit boards or neural network connections, with lines and small circles.

MTA 98-381

LESSON 1

STARTING WITH

PYTHON

PYTHON

- Top programming language in IEEE Spectrum programming language ranking [2017](#), [2018](#) and 2019.
- Most popular programming language for data science and machine learning.
- Latest version is 3.7.4.
- Version 3 is not backward compatible with version 2 (Python 3 won't compile Python 2 code)
- A quick way to determine a code is Python 2 or 3 :
 - Python 2: `print "No parenthesis"`
 - Python 3: `print ("Got parenthesis")`

INSTALLING PYTHON

- <https://www.python.org/downloads/>
- Select latest version 3.7.x.
- Download Windows x86-64 executable installer
 - x86-64 is for 64-bit operating system

INTEGRATED DEVELOPMENT LEARNING ENVIRONMENT (IDLE)

- IDLE is installed during Python installation.
- IDLE provides two ways of interacting with Python:
 - A shell where you can type Python commands that are executed instantly, and
 - a text editor where you can save Python code as file.

EXERCISE: PYTHON SHELL

- A shell where you can type Python commands that are executed instantly.
- 1. Launch Python Shell.
- 2. Enter `2+3*4`.
 - 14 is returned.
- 3. Enter `(2+3)*4`.
 - 20 is returned.
- 4. Enter `2+`.
 - "SyntaxError: invalid syntax" is returned.
- 5. Enter `'hello' + ' world'`.
 - 'hello world' is returned.

EXERCISE: PYTHON SHELL (CONT.)

- 5. Enter `'2' + '3'`
 - `'23'` returned. A pair of `'` (single quote) denotes a string or text.
 - Apply `+` on 2 strings combines the strings.
- 6. Enter `"2" + "3"`
 - `'23'`. A pair of `"` (double quote) also denotes a string.
- 7. Enter `'hello' + ' world'`
 - `"SyntaxError: EOL while scanning string literal". Cannot mix ' and " in a string.`

SAVING PYTHON CODE IN FILE

- IDLE provides a text editor that allows you to save Python code in files.
- Python code files typically use `.py` as extension.
- You may use other text editor to create `.py` code.
- Recall that Python Shell shows result after pressing Enter.
 - Enter `2+3` will show `5` instantly.
- In order to see result of code in file, we use print function.
 - `print (2+3)`

EXERCISE: CREATE PYTHON CODE FILE IN IDLE

- 1. Launch IDLE.
- 2. In Python Shell, click **File** menu > **New File**.
 - IDLE text editor creates a new document named Untitled.
- 3. Type the following code in text editor.

```
1+2  
print (2+3)  
print ('2'+ '3')
```

- 4. Save the file as **first.py**.
- 5. Run the program by clicking **Run** menu > **Run Module** (or use shortcut key **F5**). The following results are shown.

```
5  
23
```


EXERCISE: PRINT FUNCTION

- 1. Add the following code in text editor.

```
Print (2+3)
```

- 2. Run the program to see if it works.

NameError: name 'Print' is not defined.

- Python is case-sensitive. 'print' and 'Print' are not the same.
- 3. Change the 'P' to 'p', then add 2 more lines of code:

```
print (2+3)  
print ('2'+ '3')  
print (2+3, '2'+ '3')
```

EXERCISE: PRINT FUNCTION (CONT.)

- 4. Run the program. Result:

5

23

5 23

PYTHON COMMENTS

- Comments are ignored by Python.
- Comments are used by programmer for writing notes.
- A comment begins at the character `#` (hash sign) and extends to the end of that line.
- Exercise: Update your previous code as follows:

```
# comments are ignored by Python.
```

```
print (2+3)          # 5
```

```
print ('2'+'3')      # 23
```

```
print (2+3, '2'+'3') # 5 23
```

- Run the program. The result is the same.

ESCAPE CHARACTERS IN TEXT

- Allows us to include quote characters in a string.
- ESCAPE SEQUENCE WHAT IT MEANS
 - `\\` Backslash `\`
 - `\'` `'`
 - `\"` `"`
 - `\n` Line Feed/New Line
 - `\t` Tab

EXERCISE: HOW TO PRINT QUOTATION (' OR ")?

- 1. How to print single quote?
 - Output: `Domino's Pizza`
 - Use `\'` or double quote as delimiter `" ' "`.
- 2. How to print double quote?
 - Output: `"Python is easy"`
 - Use `\"` or single quote as delimiter `' " ' "`.
- 3. How to print both single and double quote in a sentence?
 - Output: `Python says, "I love Domino's Pizza!"`
 - Use `\'` and `\"` or triple quotation as delimiter.