

# IMSAL coding events: Learning Python (session 1)

- **Python:** is a (interpreted) high level programming language
- **PyCharm:** is an IDE (Integrated Development Environment) for the Python language. So PyCharm is only a coding assistance, not a language. It provides features like code-completion, quick fixes, error highlighting etc. (PyCharm itself is written in Java & python).

## Content of this session

### 1. Some built-in features of Python

1. Built-in calculator
2. Built-in datatypes (int, float, str ...)
3. Built-in functions (input(), print())
4. How to make comments by using '#'

### 2. Variables

1. How to initialize a variable (by giving it a value)
2. How to modify the content of a variable
3. How to make mathematical operations with variables
4. How to name variables (multiple words separated by underscore ('\_') not by a space !)

### 3. Strings

1. A string is an array of characters
2. How make indexation and take slices of a string by using []

### 4. Applying the built-in functions to ask for user input and "outputting" a welcome message

### 5. Conditionals

1. Boolean datatype (True, False)
2. If, else.
3. Boolean operators (and, or)

### 6. Applying conditionals for making a user-login program (based on name and password)

## 1) Built-in features

Calculator	<pre>&gt;&gt;&gt;5+3 8 &gt;&gt;&gt;5*3 15 &gt;&gt;&gt;5/3 1.6666666666666667 &gt;&gt;&gt;5-3 2 &gt;&gt;&gt;5**3 125 &gt;&gt;&gt;5//3 1</pre>
Datatype	<pre>&gt;&gt;&gt;type(2) int &gt;&gt;&gt;type(2.0) float</pre>
Ask for Input	<pre>input() # When the compiler will reach this line, it         # will stop here and wait for some input (that         # finishes when hitting enter)  input("What is your name? ") # This will print out                              # "What is your name? "                              # and wait for some input</pre>
Print on standard output stream	<pre>print(2) # → 2      print(2+2) # → 4 print("Hello world !") # → Hello world</pre>

[https://www.youtube.com/watch?v=hnxIRVZ0EyU&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC\\_&index=1](https://www.youtube.com/watch?v=hnxIRVZ0EyU&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC_&index=1)

## 2) Variables

Initializing and modifying	<pre>&gt;&gt;&gt;a = 2 # Always: variable-name at the LEFT gets &gt;&gt;&gt;b = 3 # value at the RIGHT.  &gt;&gt;&gt;a = b # It is 'a' that gets the value of 'b'.         # 'b' stays unchanged !! (a=3,b=3)  &gt;&gt;&gt;my_name = "Adam"</pre>
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### 3) Strings

Indexing	<pre>&gt;&gt;&gt;my_word = "IMSAL" &gt;&gt;&gt;my_word[0]    # Get first character (starts with 0) 'I' &gt;&gt;&gt;my_word[1]    # Get second char 'M' &gt;&gt;&gt;my_word[-1]   # Get last char 'L' &gt;&gt;&gt;len(my_word)  # Get length of the string 5</pre>
Slicing	<pre>&gt;&gt;&gt;my_sentence = "IMSAL is cool" #Space counts as char &gt;&gt;&gt;my_sentence[6:8]  # From pos 6 to 8(8 non included) 'is' &gt;&gt;&gt;my_sentence[5:6] ' ' # → empty string &gt;&gt;&gt;my_sentence[:5]  # [:5] is same as [0:5] 'IMSAL' &gt;&gt;&gt;my_sentence[6:]  # [6:] is same as [6:end] 'is cool' &gt;&gt;&gt;my_sentence[:]   # [:] is same as [0:end] 'IMSAL is cool'</pre>

<https://www.youtube.com/watch?v=nefopNkZmB4&index=2&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC>

[https://www.youtube.com/watch?v=YbipxqSKx-E&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC\\_&index=3](https://www.youtube.com/watch?v=YbipxqSKx-E&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC_&index=3)

### 4) Welcome-message program

<pre>name = input("Hello, what is your name ? ") print("Welcome", name)</pre>
<pre>/usr/bin/python3.6 /home/adam/Documents/IMSAL/CodingSessions/File1.py  Hello, what is your name ? Adam Welcome Adam  Process finished with exit code 0</pre>

## 5) Conditionals

Boolean operations	<pre>&gt;&gt;&gt;True and False &gt;&gt;&gt;True and True &gt;&gt;&gt;True or False False                True                True</pre>
Comparison	<pre>&gt;&gt;&gt;a = 2 &gt;&gt;&gt;b = 3  &gt;&gt;&gt;a == b # Is a equal to b ? False &gt;&gt;&gt;a != b # Is a not equal to b ? True &gt;&gt;&gt;a &lt; b &gt;&gt;&gt;a &gt;= b True      False</pre>
Conditionals	<pre>a = 2 if a == 2:     print("something") else:     print("something else")</pre>

[https://www.youtube.com/watch?v=bk22K1m0890&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC\\_&index=6](https://www.youtube.com/watch?v=bk22K1m0890&list=PL6gx4Cwl9DGAcbMi1sH6oAMk4JHw91mC_&index=6)

## 6) User-login program

<pre>name = input("name: ") password = input("password: ") if name == "Adam" and password == "mypassword":     print("Welcome sir", name) else:     print("Invalid name and/or password")</pre>
<pre>/usr/bin/python3.6 /home/adam/Documents/IMSAL/CodingSessions/File1.py  name: Adam password: mypassword Welcome sir Adam  Process finished with exit code 0</pre>