



INTRODUCTORY COURSE ON PYTHON IN PHYSICS

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Overview

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- Arithmetic Operation

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- Arithmetic Operation
- Operator Assignment

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- Variable Assignment

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- Container

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- Container
- Programming Statement

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- Introduction to NUMPY - Demonstration with Jupyter Worksheet

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- IBM-Q - Application of Python Programming in Quantum Information Science

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- Simulation Based Studies using Python
- IBM-Q - Application of Python Programming in Quantum Information Science
- Conclusion

Section I: Arithmetic Operation

Mathematical Operation

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Mathematical Operation

- Expression (10 ± 7 , $10 * 7$, $10 / 7$, $10 // 7$, $10 \% 7$, $10 ** 7$)

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Mathematical Operation

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- Operator (+, -, *, /, //, %, **)

Section I: Arithmetic Operation

Mathematical Operation

- Expression (10 ± 7 , $10 * 7$, $10 / 7$, $10 // 7$, $10 \% 7$, $10 ** 7$)
- Operator (+, -, *, /, //, %, **)
- Operand (10, 7)

Math Operation & Their Prioritization

Section I: Arithmetic Operation

Mathematical Operation

- Expression (10 ± 7 , $10 * 7$, $10 / 7$, $10 // 7$, $10 \% 7$, $10 ** 7$)
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Math Operation & Their Prioritization

- Parenthesis ()

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Math Operation & Their Prioritization

- Parenthesis ()
- Exponentiation **

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- Operator (+, -, *, /, //, %, **)
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Math Operation & Their Prioritization

- Parenthesis ()
- Exponentiation **
- Multiplication *

Mathematical Operation

- Expression (10 ± 7 , $10 * 7$, $10 / 7$, $10 // 7$, $10 \% 7$, $10 ** 7$)
- Operator (+, -, *, /, //, %, **)
- Operand (10, 7)

Math Operation & Their Prioritization

- Parenthesis ()
- Exponentiation **
- Multiplication *
- Floor Division / & Division //

Mathematical Operation

- Expression (10 ± 7 , $10 * 7$, $10 / 7$, $10 // 7$, $10 \% 7$, $10 ** 7$)
- Operator (+, -, *, /, //, %, **)
- Operand (10, 7)

Math Operation & Their Prioritization

- Parenthesis ()
- Exponentiation **
- Multiplication *
- Floor Division / & Division //
- Modulo %

Section I: Arithmetic Operation

Mathematical Operation

- Expression (10 ± 7 , $10 * 7$, $10 / 7$, $10 // 7$, $10 \% 7$, $10 ** 7$)
- Operator (+, -, *, /, //, %, **)
- Operand (10, 7)

Math Operation & Their Prioritization

- Parenthesis ()
- Exponentiation **
- Multiplication *
- Floor Division / & Division //
- Modulo %
- Addition, Subtraction +, -

Section II: Logical Operation

Boolean Operation

Boolean Operation

- True

Boolean Operation

- True
- False

Boolean Operation

- True
- False
- Logical And

Boolean Operation

- True
- False
- Logical And
- Logical Or

Section II: Logical Operation

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

- Equal (=)

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

- Equal ($=$)
- Not-equal (\neq)

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

- Equal ($=$)
- Not-equal (\neq)
- Greater Than ($>$)

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

- Equal ($=$)
- Not-equal (\neq)
- Greater Than ($>$)
- Less Than ($<$)

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

- Equal ($=$)
- Not-equal (\neq)
- Greater Than ($>$)
- Less Than ($<$)
- Greater Than Equal To (\geq)

Boolean Operation

- True
- False
- Logical And
- Logical Or
- Logical Not

Comparison Operation

- Equal ($=$)
- Not-equal (\neq)
- Greater Than ($>$)
- Less Than ($<$)
- Greater Than Equal To (\geq)
- Less Than Equal To (\leq)

Operator Assignment:

Operator Assignment:

- Assignment (For example, $x = y$)

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $-=$ Assignment (For example, $x -= x$)

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $- =$ Assignment (For example, $x -= x$)
- $* =$ Assignment (For example, $x * = x$)

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $-=$ Assignment (For example, $x -= x$)
- $*=$ Assignment (For example, $x *= x$)
- $/=$ Assignment (For example, $x /= x$)

Variable Assignment:

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $-=$ Assignment (For example, $x -= x$)
- $*=$ Assignment (For example, $x *= x$)
- $/=$ Assignment (For example, $x /= x$)

Variable Assignment:

- Integer

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x+=x$)
- $-=$ Assignment (For example, $x-=x$)
- $*=$ Assignment (For example, $x*=x$)
- $/=$ Assignment (For example, $x/=x$)

Variable Assignment:

- Integer
- Float

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $-=$ Assignment (For example, $x -= x$)
- $*=$ Assignment (For example, $x *= x$)
- $/=$ Assignment (For example, $x /= x$)

Variable Assignment:

- Integer
- Float
- String

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $-=$ Assignment (For example, $x -= x$)
- $*=$ Assignment (For example, $x *= x$)
- $/=$ Assignment (For example, $x /= x$)

Variable Assignment:

- Integer
- Float
- String
- Type

Operator Assignment:

- Assignment (For example, $x = y$)
- $+=$ Assignment (For example, $x += x$)
- $-=$ Assignment (For example, $x -= x$)
- $*=$ Assignment (For example, $x *= x$)
- $/=$ Assignment (For example, $x /= x$)

Variable Assignment:

- Integer
- Float
- String
- Type
- Class and Order

Collections

Collections

- List

Collections

- List
- Tuple

Collections

- List
- Tuple
- Set

Collections

- List
- Tuple
- Set
- Dictionary

Collections

- List
- Tuple
- Set
- Dictionary
- Array

Others

Collections

- List
- Tuple
- Set
- Dictionary
- Array

Others

- Builtin & User Defined Function

Collections

- List
- Tuple
- Set
- Dictionary
- Array

Others

- Builtin & User Defined Function
- Class

Collections

- List
- Tuple
- Set
- Dictionary
- Array

Others

- Builtin & User Defined Function
- Class
- Object

Collections

- List
- Tuple
- Set
- Dictionary
- Array

Others

- Builtin & User Defined Function
- Class
- Object
- Import Module

Section IV: Statement in Programming

Loop Statement

Loop Statement

- For & Nested For

Loop Statement

- For & Nested For
- While & Nested While

Loop Statement

- For & Nested For
- While & Nested While
- Continue

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

- If & Nested If

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

- If & Nested If
- Else

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

- If & Nested If
- Else
- Elseif

Control Structure

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

- If & Nested If
- Else
- Elseif

Control Structure

- Sequential Control

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

- If & Nested If
- Else
- Elseif

Control Structure

- Sequential Control
- Selection Control

Loop Statement

- For & Nested For
- While & Nested While
- Continue
- Break

Conditional Statement

- If & Nested If
- Else
- Elseif

Control Structure

- Sequential Control
- Selection Control
- Iterative Control

Demonstration using JUPYTER Worksheet:

- BASIC PYTHON CODES - Built-In-Operation
- NUMPY - Package for Numerical Computation
- SYMPY - Package for Symbolic Calculation
- MATPLOTLIB - Package for Graphical Solution
- NUMPY, SYMPY, MATPLOTLIB, LINEAR ALGEBRA Packages Combined - For Simulation Based Studies
- IBM-Q - Application of Python Programming in Quantum Information Science