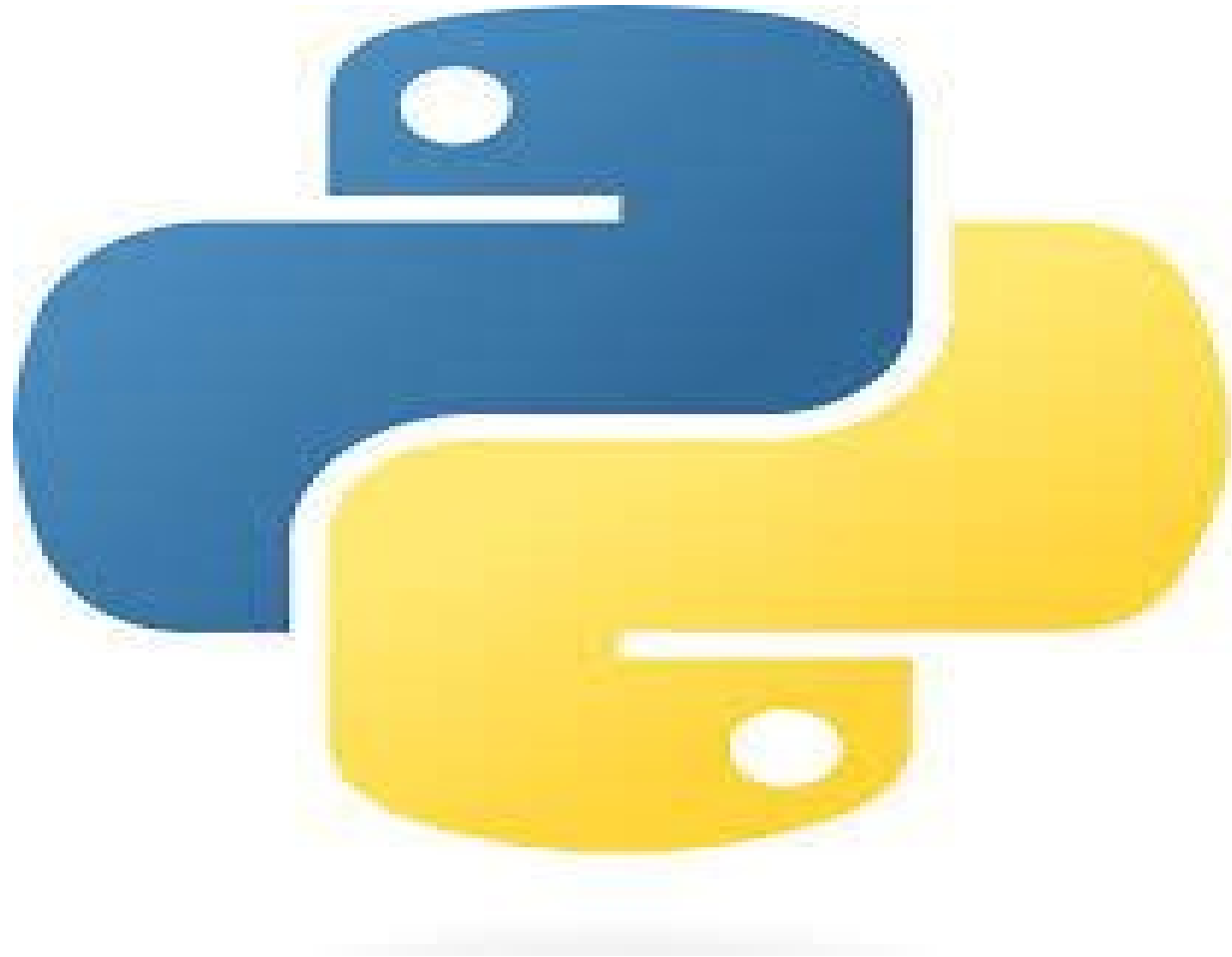


ITEC322

Python Programming

Introduction



In a nutshell

- From the developers
- Python is a programming language that lets you work quickly and integrate systems more effectively. (Python.org)

Why learn Python?

- Career opportunities with enticing salaries
- Data science
- Effective and efficient web development
- Supports machine learning efficiently
- Convenient for scripting and automation
- Relevant libraries and packages
- Framework tests

Why learn Python

- Portability and extensibility
- Active Community
- Easy to use

Composition of Python

- Qualifies as OOP
- A sequence of definitions and statements (commands)
- Every object is related with a Type (set of values and operations)
- Expressions involve an operation (thus combination of objects and operators)

Types used in Python programming

- **Int (integer)**

- Bounded integers, e.g. 216 or -125

- **float**

- Real numbers, e.g. 23.142 or 12.0

- **long**

- Long integers. Precision unlimited

- **str**

- Strings, e.g. 'hi' or 'Z'

Other Types

- **Scalar**

- Refers to indivisible objects that do not have an internal structure
- **int** (signed integers), **float** (floating point), **bool** (Boolean), ***NoneType***
 - NoneType is a special type with a single value
 - The value is called **None**

- **Non-Scalar**

- Refers to objects having internal structure
- **str** (strings)

Type casting

- Involves Conversion of a value of one type to other
 - Integer 6 is treated as float 6.0 when a real number is expected
 - Float 12.4 is truncated as 12 or rounded off as 12 for integer contexts

Operator Used

- Arithmetic : + - / // * % **
- Comparison : == != > < >= <=
- Assignment: = += -= *= //= /= %= **=
- Logical: and or not
- Bitwise: & | ^ ~ << >>
- Membership: in not in
- Identity: is is not

Python variables

- Binding assignments
 - E.g. `a = 6;`
 - `P = 'BSc.;`
- Variables can change their bindings.
 - `P = 'MSc.'`
- Associated name with an object

Assignment Statement

- `=` is known as the assignment operator.
- A simple assignment statement
Name of Variable = Expression;
- The computed value (object) of the expression on the right-hand side expression on the right hand side (RHS)
- Associates the name (variable) on the left-hand side (LHS) with the RHS value

Multiple Assignments

- Binding 5 to x and 7 to x is permitted in Python
- `x, y = 5, 7`

`l, j = l + 2, j + 2`

Binary operations in Python

Operation	Meaning	Example	Remarks
+	Addition	2 + 3 is 5 2.1 + 3.0 is 5.1	
-	Subtraction	5 – 1 is 4 5.1 – 1.0 is 4.0	
*	Multiplication	3 * 2 is 6 3.1 * 2.0 is 6.2	
/	Division	3 / 2 is 1.5	Peculiar to Python
//	Integer Division	3 // 2 is 1 -1//2 is -1 -1//-2 is 0	Actual division Floor/real towards minus infinity
%	Remainder	3 % 2 is 1	

The % operator

- The remainder operator % returns the remainder of the result of dividing its first operand by its second.

5%2 is 1	(-1)%2 is 1	(-1)//(-2) is 0
3%1.5 is 0.0	1%(-2) is 1	1%0.6 is 0.4

Ideally: $x == (x // y) * y + x \% y$

Conditional Statements

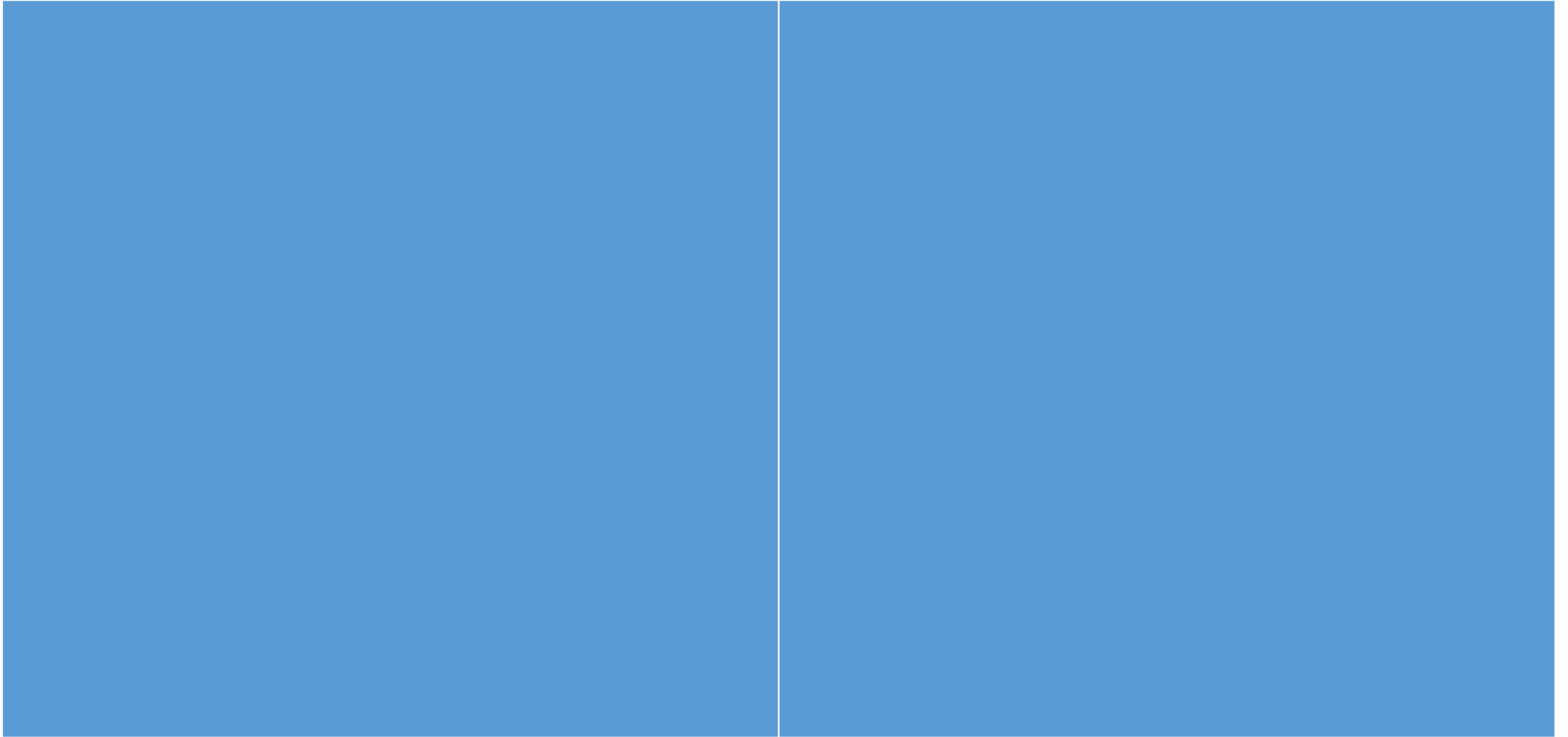
If ...

```
If age >=18:  
  
    print ("Qualified")
```

If-else

```
If score >= 50:  
    Print ('pass')  
  
else:  
    Print ('fail')
```


Else-if, Elif



Activity 1B

- ..

More on Python programming in our next meeting