Software Systems Development Lab

Will start at 2.35PM

29/09/2020

*Python is an **interpreted**, **high-level** and **general-purpose programming** language.*

- Python environment setup
- Python basics
  - Variables, data types, operations
  - Demo:
    - Data types
    - Operations
    - Conditions and IF statements
    - Loops

Python Environment Setup

- To check installed version:
  - `python --version` -- if returns Python 2.xx then try `python3 --version`
  - Python 3.xx is required in this course
- Python3 installation
  - Linux: install through terminal
    - `sudo apt-get update`
    - `sudo apt-get install python3.6`
  - Windows and macOS
    - Go to https://www.python.org/downloads/release/python-386/
    - Go to Files section and download
      - *Windows x86-64 executable installer* for Windows 64-bit
      - *macOS 64-bit installer* for macOS
    - Follow on-screen instructions

Variables and Data Types

- Declaring a variable
  - `variable_name = value`
  - No need to declare variables before using them, or declare their type
- Data types

Text Type	`str`
Numeric Types	`int`, `float`, `complex`
Sequence Types	`list`, `tuple`, `range`
Mapping Type	`dict`
Set Types	`set`, `frozenset`
Boolean Type	`bool`

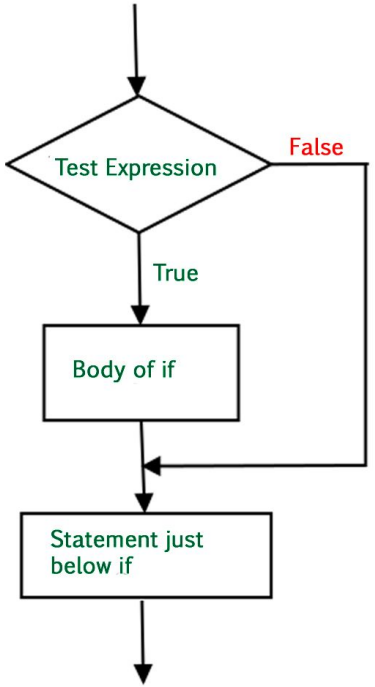
Operations

Operation	Result
`x + y`	sum of x and y
`x - y`	difference of x and y
`x * y`	product of x and y
`x / y`	quotient of x and y
`x % y`	remainder of x / y
`-x`	x negated
`+x`	x unchanged
`abs(x)`	absolute value or magnitude of x
`pow(x, y)` or `x ** y`	x to the power y

Conditions and IF Statements

- Operators
  - AND, OR, IN, IS, NOT, ==, !=
- Syntax of if statement

```
statement = a OR b

another_statement = b OR c

if statement :

    // do this

elif another_statement:

    // do that

else:

    // do something else
```



Loops

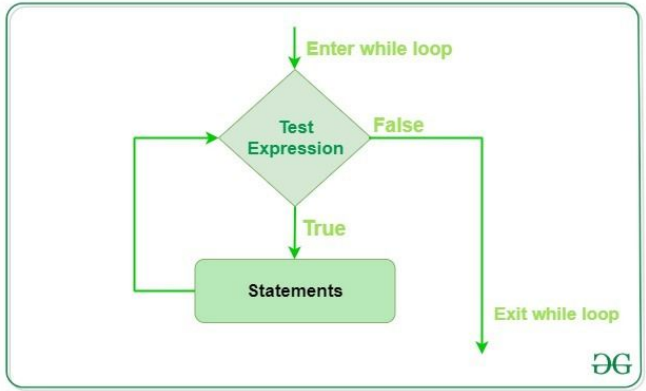
- while loop

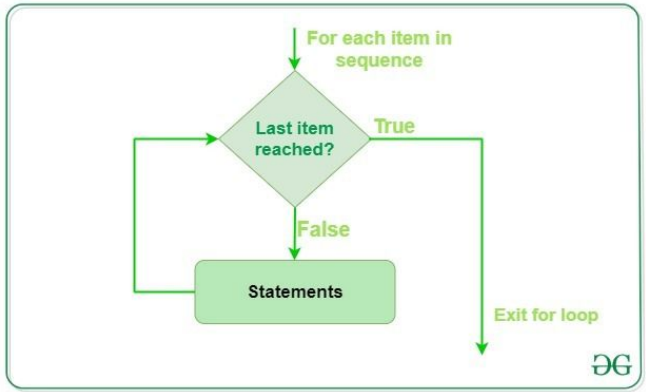
```
i = 1
while i < 6:
  print(i)
  i += 1
```

- for loop

```
fruits = ["apple", "banana", "cherry"]

for x in fruits:
  print(x)
```

```
for x in range(2, 6):
  print(x)
```





Demo

- To be used for lab demo
  - Google Collab -- https://colab.research.google.com/
  - Python examples notebook PDF -- Python-SSD Lab.pdf

Online Resources

- Variables and Types - learnpython.org
- Conditions - learnpython.org
- Loops - learnpython.org
- A Beginner's Python Tutorial/Very Simple Programs
- The Hitchhiker's Guide to Python
- Python Examples