LOVELY PROFESSIONAL UNIVERSITY

Pandemic Analytics

2.1

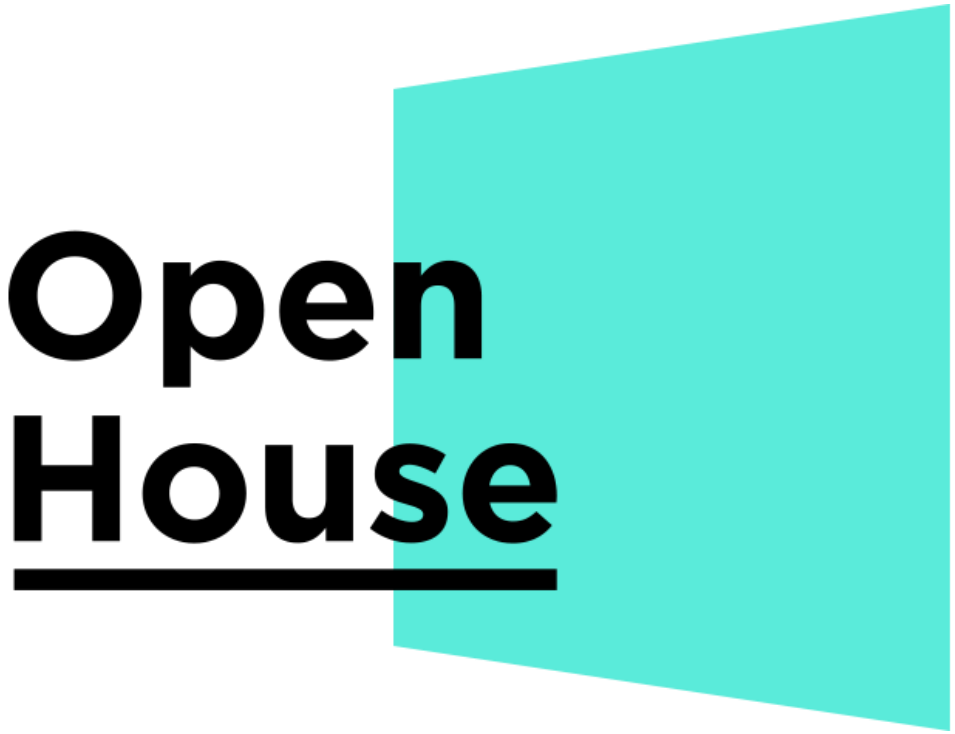
Python Programming Fundamentals

Day: **2**

Session: **1**

ETD: **40 min**

Day 1: Open house



Share your views, opinions and suggestions on the content, delivery and exercises of the previous day!!!

Day 1: THE Review

During the session, sample data structures were created with 5 elements.

- **Populate these lists, tuple and the dictionary with all state data to be discovered.**

tomorrow!!!

Recap

Python: Conditions

Python supports the usual logical conditions from mathematics:

- Equals: a == b
- Not Equals: a != b
- Less than: a < b
- Less than or equal to: a <= b
- Greater than: a > b
- Greater than or equal to: a >= b

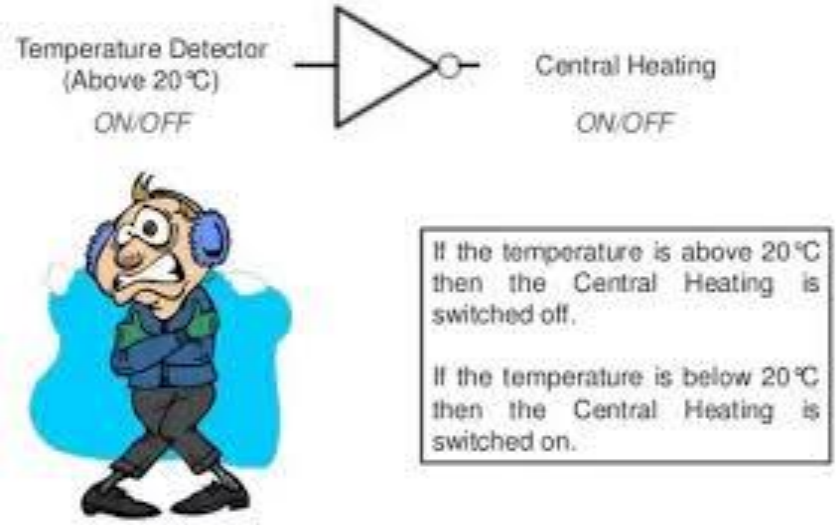
Conditions: Boolean Expressions

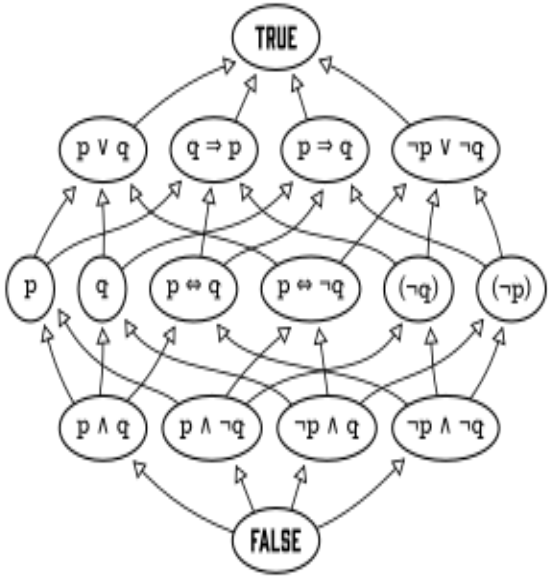
True or False

It is a statement that returns true or false.

a==7 and b==7, a>2 or b>2

To Store – **Yes or No, Process, Events**





Branching

if Statements in Python allows us to tell the computer to perform alternative actions based on a certain set of results. Ex: if , if-else, elif

Two types : Single Branching or Multiple Branching

In [1]:
```
if True:
    print('Indian cases are above 1,00,000')
```

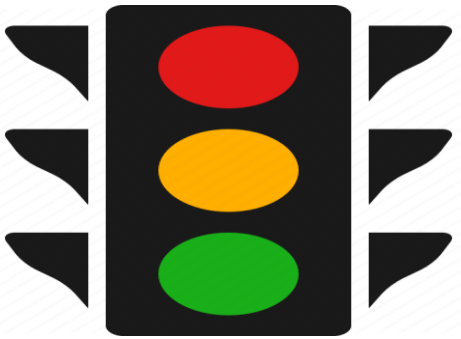
```
Indian cases are above 1,00,000
```

In [2]:
```
x = False

if x:
    print('INDIA!')
else:
    print('USA')
```

```
USA
```

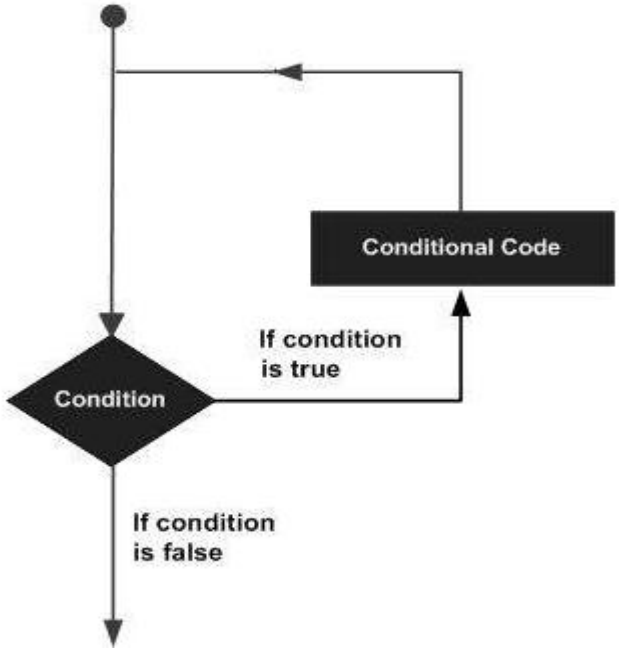
In [3]:
```
loc = 'CASES'

if loc == 'Symptoms':
    print('Cough, Fever, Cold')
elif loc == 'Cases':
    print('More Than 1,00,000 Cases')
else:
    print('Are you safe?')
```

```
Are you safe?
```



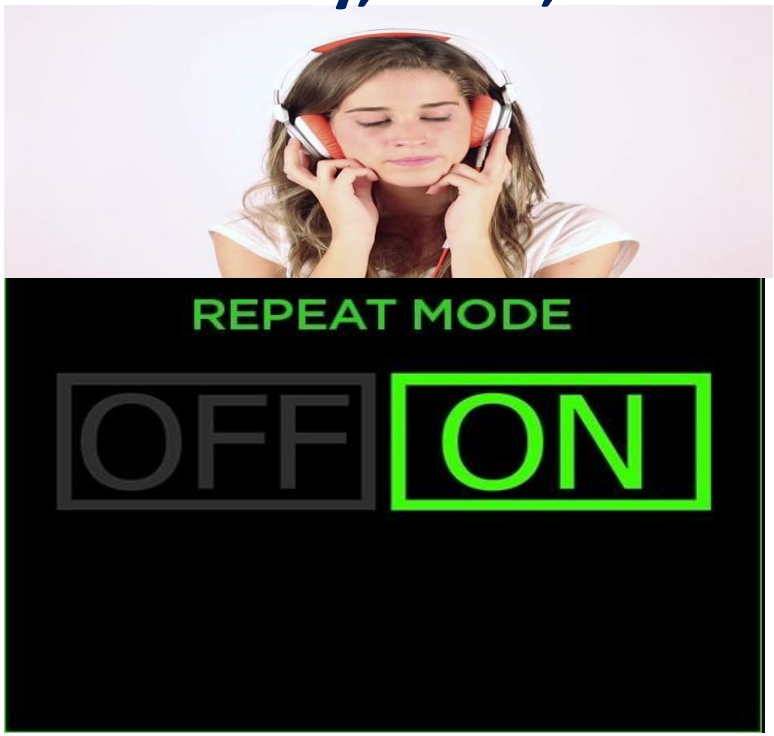
Loops

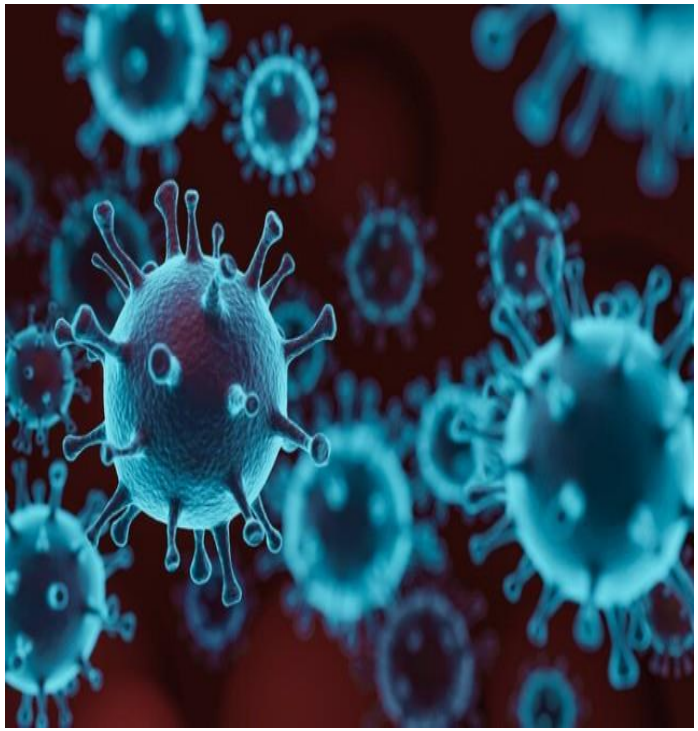
A loop statement allows us to execute a statement or group of statements multiple times. Two Types of Loops in Python: For and While



For Loop

A for loop is used for iterating over a sequence (that is either a list, a tuple, a dictionary, a set, or a string)





While Loop

While Statement

True, False

In the while loop we can execute a set of statements as long as a condition is true

Functions

- A **function** is a named sequence of statements that belong together
- Purpose is to help us **organize logic into chunks** that match how the solution to a problem is structured
- **Reusability** is the key
- A function can call **other** functions
- A function can call **itself** as well
- **Fruitful functions** – returns a value

Modules

- A module is **bundle of functions**
- **Import** a module to use the group of functions defined in it

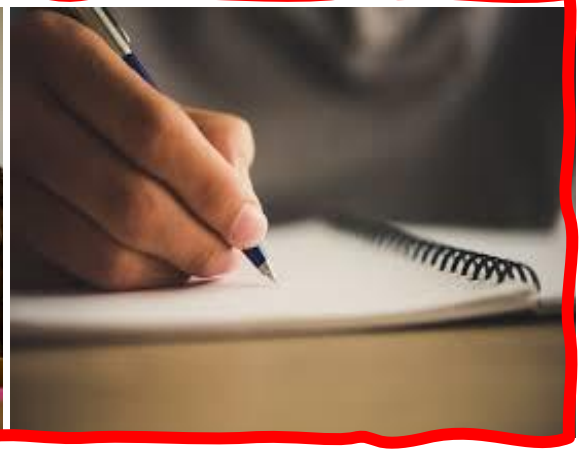
```
# A simple module, calc.py

def add(x, y):
    return (x+y)

def subtract(x, y):
    return (x-y)
```

```
# importing  module calc.py
import calc

print add(10, 2)
```

Real Life : Examples

Real Life : Examples

Real Life : Examples



Functions

Function Call

Function in Python is defined by the "def " statement followed by the function name and parentheses (())

Functions

Infection Fatality Rate (IFR)

In [32]:
```
# Function to calculate INFECTION FATALITY RATE
def ifr(infected, deaths):
    ifr = (deaths/infected)*100
    print("The IFR = {} %". format(ifr))
```

In [33]:
```
ifr(10000,10)
```

```
The IFR = 0.1 %
```

In [34]:
```
ifr(436552, 1832)
```

```
The IFR = 0.4196521834741337 %
```

Types of Function Calls

Built-in functions : abs(), all(), any(), ascii()

User-Defined Functions (UDFs)

Anonymous Functions

User Defined Functions

- User-Defined function begins with the keyword def and followed by the function name.
- The function takes argument(s) as input within the opening and closing parenthesis.
- After defining the function name and argument(s) a block of program statement(s) start at the next line and these statement(s) must be indented.

Anonymous Functions

function that is defined without a name

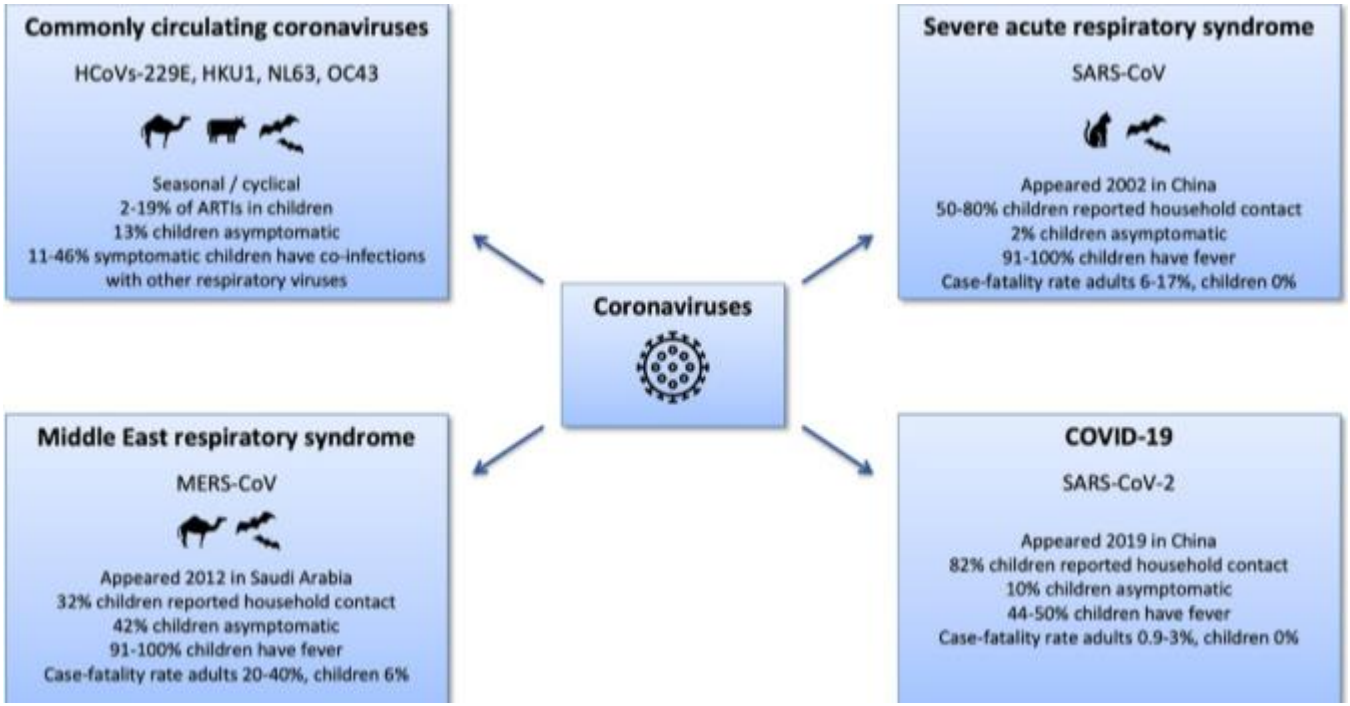
in Python anonymous functions are defined using the

Lambda keyword

```
double = lambda x: x * 2

# Output: 10
print(double(5))
```

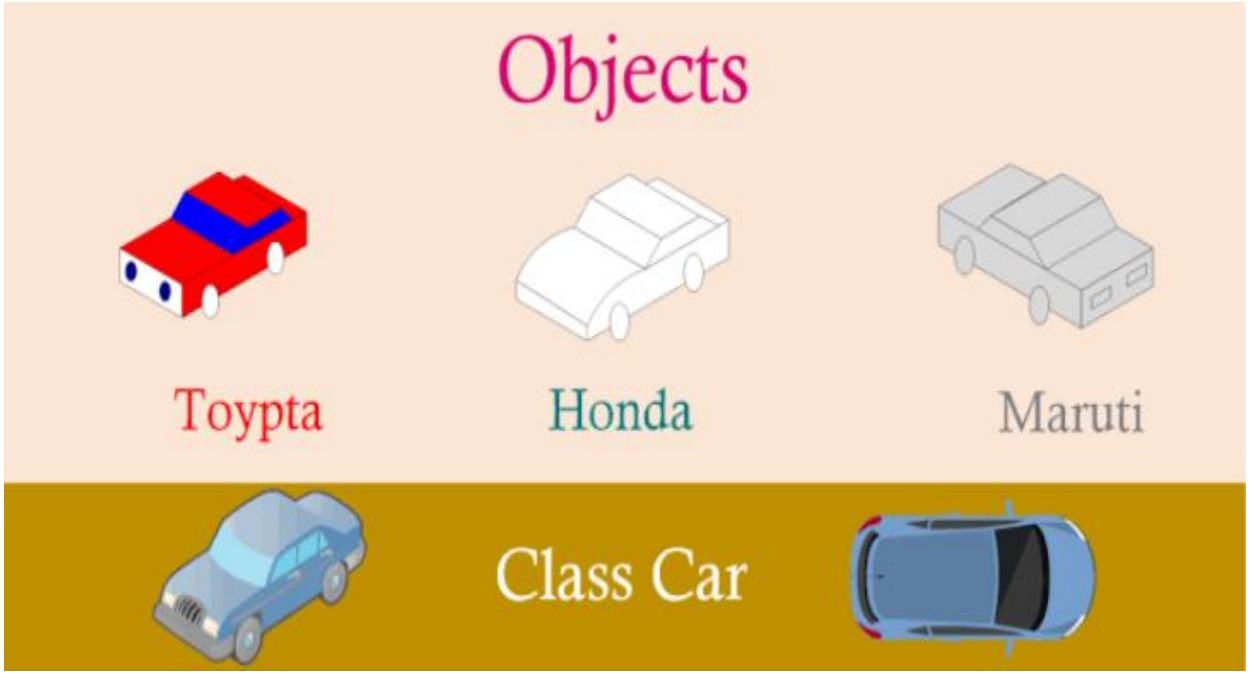
Objects and Classes

Python is an object oriented programming language. Object is simply a collection of data (variables) and methods (functions) that act on those data.



Classes

A Class is like an object constructor, or a "blueprint" for creating objects



In session exercise

Say for district “Mumbai”

- Infected total till date = 136596
- Recovered till date = 67890
- Deaths till date = 5732

Use ifr function and calculate the IFR

Build a function for CMR (Crude Mortality Rate)

Hands in grease

Let’s get our hands wet

Take away

Python Programming

- Coding, Problem Solving using Conditions
- Loops
- Functions
- Objects and Classes

Day: 2
Session: 2

- ❑ **Creating GUI with Tkinker**