BASIC PYTHON PROGRAMMING

Components

- What is Python?
- Variables, Objects, and Classes
- Basic Syntax Rules
- Common Data Types and Operators
- Input/Output

What is Python?

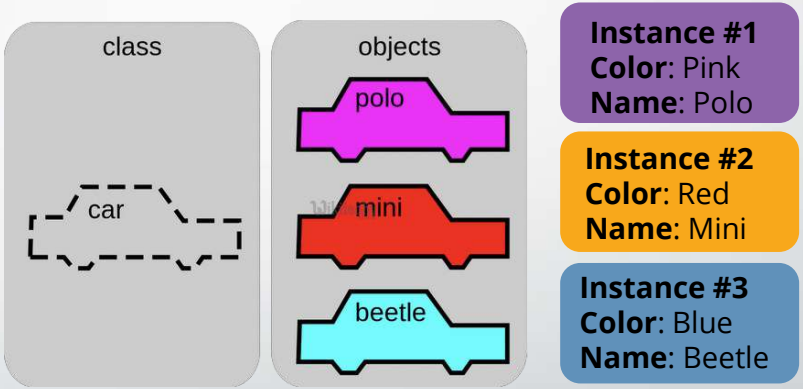
- Python is a popular high-level programming language used in various applications
  - Python is an easy language to learn because of its simple syntax
  - Python can be used for simple tasks such as plotting or for more complex tasks like machine learning

Variables, Objects, and Classes

- A **variable** is a reference to a value stored in a computer's memory.
- Variables can be sorted into a variety of categories (or **data types**) such as **numbers (int/float etc), Boolean values (true/false),** and **sequences (strings, lists etc)**.
- An **object** is a collection of data from a computer's memory that can be manipulated.

Variables, Objects, and Classes (cont.)

- A **class** is a collection of objects who share the same set of variables/methods.
  - The definition of the class provides a blueprint for all the objects within it (**instances**).
  - Instances may share the same variables (color, size, shape, etc.), but they do **NOT** share the same values for each variable (blue/red/pink, small/large, square/circular etc.)



Basic Syntax Rules

- Function Syntax
  - **def…:** indicates that you are defining a new function.
  - **function()** refers to the name of your function. By convention, this name is typically lowercase and represents a verb/action.
  - The **return** statement is an optional statement that will return a value for your function to your original call

```
def function(a, b):
    ......
    return a + b
```

Common Data Types and Operators

- A **data type** is a means of classifying a value and determining what operations can be performed on it. All objects have a data type.
- **Operators** are symbols used carry out specific functions/computations.

Operator	Description
**	Exponentiation (raise to the power)
~ + -	Ccomplement, unary plus and minus (method names for the last two are +@ and -@)
* / % //	Multiply, divide, modulo and floor division
+ -	Addition and subtraction
>> <<	Right and left bitwise shift
&	Bitwise 'AND'
^ |	Bitwise exclusive `OR' and regular `OR'
<= < > >=	Comparison operators
<> == !=	Equality operators
= %= /= //= -= += *= **=	Assignment operators
is is not	Identity operators
in not in	Membership operators
not or and	Logical operators

Class	Description
bool	Boolean value
int	integer (arbitrary magnitude)
float	floating-point number
list	mutable sequence of objects
tuple	immutable sequence of objects
str	character string
set	unordered set of distinct objects
frozenset	immutable form of set class
dict	associative mapping (aka dictionary)

Input/Output

- **Input functions** (**input()**) allow users of a program to place values into programming code.
    - The parameter for an input function is called a **prompt**. This is a string (this can be indicated by “” or ‘’) such as **“Enter a number: “**
- **Print functions** (**print()**) allow programs to output strings to users on a given interface.
    - The parameter of this function is of any type. All types will automatically be converted to strings.

```
xString = input(“Enter a number
x = int(xString)
y=x+2
print(y)
```

THANK YOU