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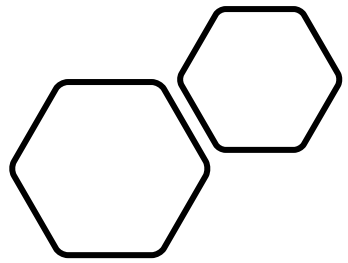
Python Basics Curriculum

Charting a Course for Young Coders

Pre-requisites

- Computer (Windows, macOS, or Linux).
- Internet connection (for online resources and libraries).
- Text editor or integrated development environment (IDE) like Pycharm/Spyder/VS code.
- ZOOM for attending online sessions
- Adequate RAM (minimum 8 GB) and storage for seamless coding and running programs.



Highlights

- **Comprehensive Home Assignments:** Receive assignments for each topic to reinforce learning.
- **Live Coding Problem Statements:** Tackle real-time coding challenges for practical experience.
- **Structured Curriculum:** Progressively build skills through a meticulously crafted and structured curriculum , this helps to assimilate the concepts better

Week 1: Introduction to Python

Introduction

Overview

History

Features

Future and current trends

Applications of Python

Environment setup

Downloading Python

Installation

Setting-up system and Python environment

Launching Python and IDE

Introduction to Online platform for python executions

Jupyter Lab environment

Initial syntaxes 1

Interactive coding

Script based coding

Identifiers

Reserved keywords

Lines and Indentation

Single line and multiple Comments

Reading inputs from user

Reading multiple values

Output Statements

Basics

Variables , Assigning values , naming conventions

Basic data types

Basic Data structures

Type casting data

Week 2: Data Types and Data structures

Basic Data Types

Integers

Float

Strings

Boolean

Strings

Creating Strings

Methods to edit and update strings

(upper ,lower , split, replace…)

Delete strings

Lists

Creating List

Adding elements to list

Accessing elements in the list

Indexing possibilities

Removing elements from the list

Updating and editing list

Deleting list

Commonly used methods of list objects

Dictionary

Creating Dictionary

Adding key-value pair to Dictionary

Accessing dictionary elements

Removing elements from the dictionary

Updating and editing

Commonly used methods of Dict objects

Week 3: Decision making and loops

Program Flow Control statements

Decision-making

Single/Multiple statements suits

Conditional statements

Transfer statements

Nested conditions

Loops

Types of Loops - while and for

Nested Looping

Loop control keywords

Week 4: Functions , Exceptional handling , Libraries and Classes and Objects

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1

Functions

- Types of Functions – In built and custom created
- Defining and calling a function
- Parameters and function returns
- Types of arguments
- Variable Scopes
- Lambda functions

2

Exceptions and Error handling

- Try, except, finally, else keywords
- Assertions
- Errors raising and handling in python

3

Modules / Libraries

- Introduction to need and applications of modules
- Create and Read Module/Package
- Importing and aliasing modules
- Installation of Python libraries

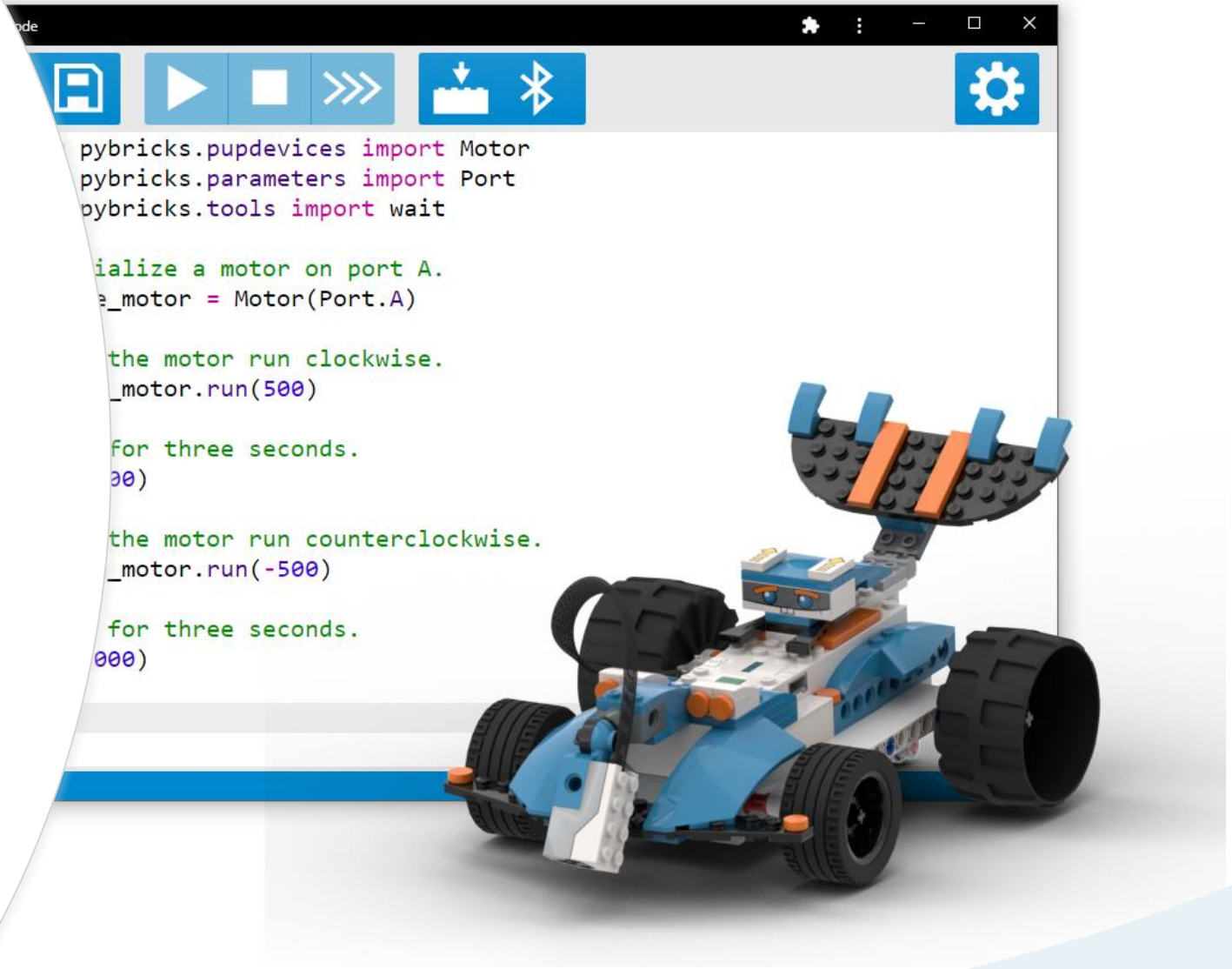
4

Classes and Objects

- Overview of Object oriented programming
- Creation of Classes and objects
- Accessing attributes and methods of class
- Inheritances (of class)

Week 5-6: Learning external Libraries to develop Lego System

- Introduction to Pybricks and LEGO Mindstorms
- Setting up Pybricks
- Basic Robotics with Pybricks
- Mini Project - Robot Navigation



TBD