

ITV 301 : Database Management and Visualization with Python

Unit 1: Python Revisited

Introduction to Object Oriented Programming, classes, inheritance, magic methods or double underscore methods (dunder methods), operator implementation with dunder methods, arguments (*args) and keyword arguments (**kwargs), exception handling and raising, decorators*.

Unit 2: Database Management

Introduction to SQLite, introduction to statements, sqlite3 python module, queries, schema, creation, insertion, deletion of data in tables, integration with Python3 using classes.

Unit 3: Data Visualization

Introduction to GUI, creation of GUI using PyQt4, QtGui, QWidget, data visualization using PyQtGraph, integration with GUI, plotting of real time data, numpy and matplotlib.

Unit 4: Integration

Sensor integration with Python3, data collection using SQLite, data analysis, cleaning data with python and sql, data interpretation.

Unit 5: Neural Networks (Moving towards self-driving Cars)

Introduction to ANN and architecture, feature space, multi-layered perceptron model, backpropagation, classification problems, convolutional neural networks, object recognition, decision making, introduction to tensorflow and keras, Carla simulator for self-driving cars.

Sources:

1. Brown MC. Python: the complete reference. McGraw-Hill Professional; 2001 Sep 1.
2. Martelli A, Ravenscroft A, Ascher D. Python cookbook. " O'Reilly Media, Inc."; 2005 Mar 18.
3. Barry P. Head First Python: A Brain-Friendly Guide. " O'Reilly Media, Inc."; 2016 Nov 21.
4. Carla Simulator, <https://carla.readthedocs.io/en/latest/>; tensorflow, <https://www.tensorflow.org/learn>

