Course Content for Summer Workshop on IOT using python

1. **Understanding and Introduction to Raspberry Pi 3 (5Hrs)**
   - What is SOC?
   - Versions of Raspberry Pi & Their Difference
   - Raspberry Pi 3
   - Basics of Electronics
   - Hardware Description
   - Pin Configuration

2. **OS Installation on SD Card (5hrs)**

   - Downloading Image for different types of OS
   - Study Various Operating Systems Available for RPI
   - Making SD Card: Formatting and Partitions
   - Raspberry Pi SD Installer

3. **OS Configuration (5hrs)**

   - Booting Into Desktop
   - GUI Version
   - CLI Desktop
   - Changing Timezone
   - Other Options
   - Raspi-Config
   - Test

4. **Network Setup (5hrs)**

   - Setting Up Using GUI
   - Setting Up Using Command Line
   - Finding Pi's IP Address
   - Connecting with Wi-Fi/ LAN/ Datacard

5. **GPIO (5hrs)**

   - Study GPIO Pins
   - Libraries Using Git
   - Configuring GPIO Pins

6. **Pi using SSH (5hrs)**

   - Enabling SSH
   - Logging in using Putty

- *Run Basic Commands*
- *Use GPIO*

7. Linux (4Hrs)

- *Understanding Linux*
- *File Structure*
- *Linux Commands*
- *Permissions*

8. Using Python (6Hrs)

- *Understanding Python*
- *Interpreted Languages*
- *Variables, Keywords, Operators and Operands*
- *Data Types in Python*
- *Flow Control*
- *Condition Statement*
- *Loops*
- *Importing Libraries*
- *Functions*
- *Classes*

9.Troubleshooting and Error handling(5Hr)

Analyze, detect, and fix code segments that have errors

- Syntax errors; logic errors; runtime errors

- Analyze and construct code segments that handle exceptions

- Try; except; else; finally; raise

10.*Performing* operation using modules *and tools (5Hrs)*

- Function in Python(return type and dynamic nature of python),some inbuilt functions

- Math; datetime; io; sys; os; os.path; random

- Solve complex computing problems by using built-in modules

- Math; datetime; random

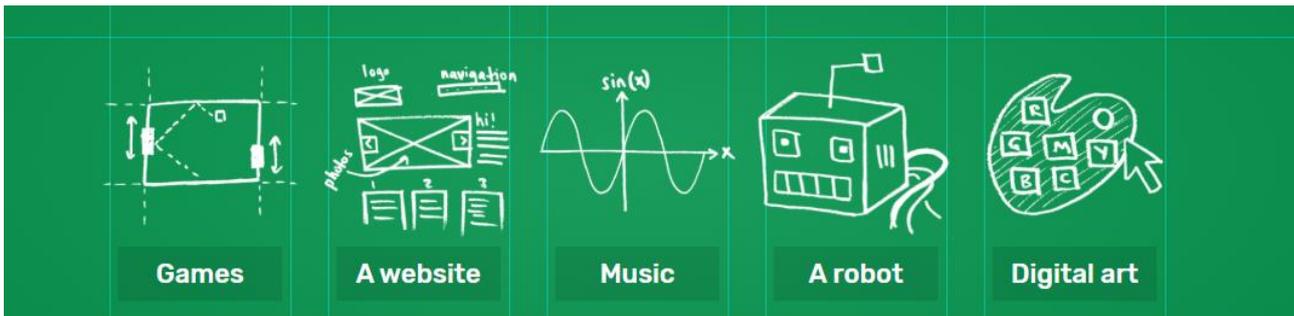### 11. Classes and Objects (*Understanding OOPS concepts*) *(5Hrs)*

12.Intro to GUI programming (5Hrs)

Project 1: Setting up Weather station using DHT11 Sensor and sending/representing data on Cloud.

Project 2: Home Automation with Bluetooth Sensor.

Project 3: Mock project using Python for GUI

Project 4: Mock project using API in python

Python certification from Microsoft

Exam 98-381

Microsoft Technology Associate

Microsoft

Introduction to Programming Using Python

$127.⁰⁰ USD*

Why python?

Python Fundamentals gets you started with Python, a dynamic language popular for web development, big data, science, and scripting. What's so great about Python? Python is powerful. The Python language is expressive and productive, it comes with a great standard library, and it's the center of a huge universe of wonderful third-party libraries. With Python you can build everything from simple scripts to complex applications, you can do it quickly, and you can do it with fewer lines of code than you might think possible. But for many people those reasons take back-seat to something more important: Python is fun! Python's readable style, quick edit-and-run development cycle, and "batteries included" philosophy mean that you can sit down and enjoy writing code rather than fighting compilers and thorny syntax. As your experiments become prototypes and your prototypes become products, Python makes the experience of writing software not just easier but truly enjoyable. In the words of Randall Munroe, "Come join us! Programming is fun again!"

Microsoft Imagine Academy