QGIS

CUSTOMIZING QGIS USING PYTHON PART II

INEGI

Objective

At the end of the Workshop, the participant will acquire the knowledge and skills necessary to automate tasks and processes that require the use of filters, modify the structure of the layers table, generate Kml, Shapes, Geojson and Geopackage to analyzethe spatial information of these, using the Python and SQLite language.

Admission profile

- Notions of Geographic Information Systems (basic knowledge of QGIS)
- SQL basics.
- Skills in managing computer systems.
- Basic knowledge of Cartography
- Basic knowledge of Python
- Intermediate programming level

Graduation profile

The participant will learn:

- Basic concepts and characteristics to generate Vector Layers with filters and their storage using PyQGIS.
- How to apply filters to Vector Layers using PyQGIS.
- How to use basic features and concepts to perform Background Tasks using PyQGIS.
- How to use basic Tools necessary for creating a Geopackage using PyQGIS.
- Basic notions and concepts of Spatial Analysis directed towards Geopackage using spatial operators in conjunction with PyQGIS.

Modality

Mixed (live sessions through the Microsoft TEAMS platform and the online SICAP platform of INEGI).

Methodology

The course consists of remote classes where the participant will replicate the exercises togetherwith the instructor.
The participant will send the worksheets for each exercise.
The grade will be obtained from the result obtained from a final exam.

Topics

1. INTRODUCTION

Objective: The participant will identify PyQGIS applications, vector layer creations, Geopackage, spatial analysis,etc. Likewise, the creation of the necessary paths for the results.

Subtopics:
1. File Paths

2. CREATING VECTOR LAYERS

Objective: The participant will learn how to create and store Vector Layers using PYQGIS

Subtopics:
1. Creating Vector Layers
2. Practice: Creating Vector Layers
3. QgsVectorLayer class for creating vector layers.

3. FILTERS IN LAYERS

Objective: The participant will identify the basic and necessary tools for creating filters within a layer in additionto storing the filtered results to obtain the desired information.

Subtopics:
1. Access the functions of a layer.
2. selectAll() and removeSelection() method
3. selectByExpression(), setFilterExpression() and selecByIds() method

4. materialize() method
5. indexFromName() method
6. Practices: Filters in Layers

4. TASKS (TASK): PERFORM HEAVY WORK IN THEBACKGROUND

Objective: The participant will use the basic functionalities for creating Tasks that require considerableprocessing time, to keep the QGIS graphical interface responsive.

Subtopics:

1. Practice: Tasks. Do heavy work in the background.

5. GEOPACKAGE

Objective: The participant will use the basic tools for creating and storing Geopackage using PyQGIS andin turn apply different tools for data identification and manipulation.

Subtopics:
1. Geopackage Spatial Analysis using the Spatialite module.
2. Geopackage creation
3. Upload a Geopackage to the Qgis canvas.
4. Access the information of the layers of a Geopackage.
5. Access a specific layer of a Geopackage.
6. Managing Geopackage with SQLite using PYQGIS

Objective: The participant will learn the basic tools of Spatial Analysis for layer manipulation, which allows toobtain personalized results based on Geopackage.

Subtopics:
1. Buffer
2. ST asText function
3. ST Intersect Function
4. ST setSRID function
5. GeomFromText function
6. Transform function.

Duration: 20 hours.

An effective workshop time of 20 hours has been considered. 10 sessions of 2 hours are recommended.

Maximum group capacity

- 25 people.

Schedule:

- Group 1: from 8:30 to 10:30, Mexico time.
- Group 2: from 12:00 to 2:00 p.m., Mexico time.
- October 14 to 25, 2024.
- Last day for registration March 29,2024.

Technical requirements.

To attend the workshop, it is necessary that each participant have a computer with internet access, and the following minimum characteristics:

RAM memory	8Gb
Processor	Intel i5 processor or equivalent
HDD	20GB free hard drive
Browser	Browser Latest versions of Chrome and Mozilla Firefox
Accessories	Headband with microphone, camera not necessary

Pre-installed software

- QGIS 3.28.6 LTR
- Microsoft Teams

Contact

For more information email:
sandra.gomez@inegi.org.mx
sergio.enriquez@inegi.org.mx