Introduction to Geoprocessing Scripts Using Python
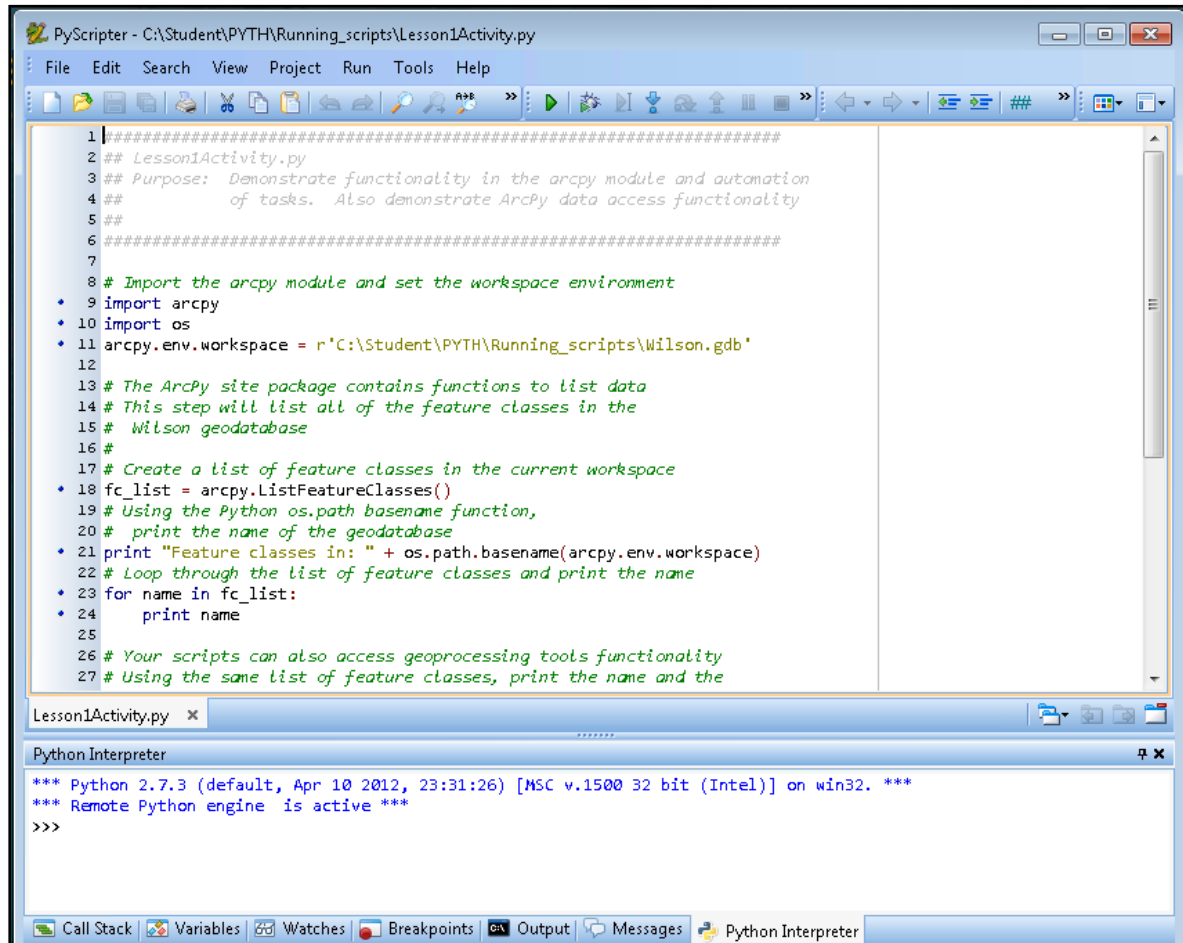
Python for ArcGIS

Level: Intermediate | Course duration: 3 days

Esri Singapore's intermediate introductory training course to geoprocessing using Python.

What is the course about?

Python scripts can reduce the time spent on complex or repetitive tasks, enabling GIS staff to be more productive. This course will teach you how to create Python scripts to automate tasks related to data management, feature editing, geoprocessing and analysis, and map production using ArcGIS. You will also learn how to share your Python scripts, so your key GIS workflows are accessible to others.

Who is the target audience?

GIS analysts, specialists, data processors, and others who want to automate ArcGIS tasks and workflows.

Are there any prerequisites?

- Completion of ArcGIS 2: Essential Workflows and ArcGIS 3: Performing Analysis or equivalent knowledge is required
- Knowledge of Python syntax and experience creating Python scripts is required. For those new to Python, Python for Everyone Using ArcGIS is strongly recommended
- Basic programming skills, including using loops and conditional statements, are required

What skills will I learn?

After completing this course, you will be able to:

- Choose a Python scripting environment that meets your needs
- Incorporate cursors, describe objects, and list objects into scripts to manage and update data
- Use ArcPy classes and geometry objects to create and update features and perform geoprocessing operations
- Use the ArcPy mapping module to automate map document and layer management
- Apply techniques to ensure valid script syntax and error handling
- Create custom script tools and geoprocessing packages to share your scripts

Course topics

Python scripting environments

- Esri ArcPy site package and modules
- ArcMap Python window
- PyScripter
- Accessing geoprocessing tools in scripts

Describing data

- Using the Describe function to return data properties
- Using data properties to make conditional decisions in a script
- Run geoprocessing tools based on a datasets reported extent

Working with lists

- List functions
- Perform geoprocessing tasks using Python lists

Working with selections

- Understanding feature layers and feature classes
- Creating selection sets using a SQL expression
- Select features using a spatial query

Course topics (cont.)

Accessing data using cursors

- Types of cursors
- Cursor object methods
- Iterating using a cursor
- Applying a selection to a cursor
- ArcPy data access module

Working with Geometry objects

- Accessing feature geometry
- Creating features
- Updating feature locations

Sharing scripts

- Custom script tools
- Geoprocessing packages

Debugging scripts and error-handling

- PyScripter debugging tools
- Writing code to handle runtime exceptions and errors
- Troubleshooting script errors

Automating map production

- ArcPy mapping module functionality
- Working with map documents
- Updating data source paths for layers
- Updating layer properties
- Modifying layout elements
- Applying custom symbology to layers