

## Module

Applied Scripting  
using Python

## Module Code

IT49450

## Duration

6 hours

# PROJECT

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**Title:** Write advance script with appropriate library package(s) according to the specifications in the project.

### Tools, Equipment and Materials:

- 1 Personal Computer with Internet Access
- 2 Python Software Tools
- 3 Webserver (for Scenario 2)

### Instructions:

1. This project is done in a group comprising of not more than 3 members in a team. The group needs to complete only one scenario based on the instruction from the Lecturer.
2. The project groups are required to do the following:
  - i. Analyze and understand the project requirements;
  - ii. Identify the appropriate library package(s) needed for the application based on the project requirements.
  - iii. Display the outcomes as appropriate for:
    - a. Data Analysis (Project Scenario 1).
    - b. Pen-Testing (Project Scenario 2).
  - iv. Present findings or insights for the data gathered or analyze.

### Deliverables

The group has to zip the application folder and presentation slides into one compressed zip file for submission. There should only be 1 submission per group.

Ensure that the following are included in the zip file:

- Application source code with comments to explain the logic and functionalities;
- Presentation slides

The group has to present the slides and demonstrate the application to the Lecturer upon completion of the project.

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## Project Scenario 1

*DataMax Pte Ltd* has just clinched a deal from an important client *ExpenseTrack Pte Ltd*. The project is to create an application to analyse travellers' trend. The application should identify the top 3 countries of visitors to Singapore from a specific region over a span of 10 years.

*ExpenseTrack* believes that Python is one of the most appropriate programming languages for data analyses. *ExpenseTrack* is expecting to use Python to create script(s) to process the below data and present an important insight.

Being an experienced Data Analyst for *DataMax*, you are expected to create Python script(s) to analyse one of the following period for only one region.

| S/No | Years       | Regions |        |   | Data   |
|------|-------------|---------|--------|---|--|
| 1    | 1978 - 1987 | Asia    | Europe | Others<br>(Non-Asia<br>&<br>Non-<br>Europe) | <br>Int Monthly<br>Visitor.xlsx |
| 2    | 1988 - 1997 |         |        |   |  |
| 3    | 1998 - 2007 |         |        |   |  |
| 4    | 2008 - 2017 |         |        |   |  |

Table 1

## Tasks

1. Create a project named DA\_<Group Name> with script(s) to use Python version 3.0 or higher.
2. The project should include Version Control Systems (VCS) for team collaboration. The team is expected to demonstrate how to create and update the project to VCS (using Github).
3. The project should import appropriate library for data analysis.
4. The path to the data file should be correctly defined for the imported library class to retrieve the relevant data.
5. The script will need to perform data retrieving procedure in the given data file:
  - i. Create appropriate class from the imported library / libraries
  - ii. Use the appropriate function to load the data
  - iii. Display the loaded information
  - iv. Parse (remove irrelevant data regions) the data based on requirement

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6. The script should prepare the data in Table 1 based on the S/No assigned to the group:
  - i. Identify the specified data for computation
  - ii. Parse (hint: split the critical information to different columns as numeric for easy processing) the data based on identification above
  - iii. Display the relevant information
  - iv. Use appropriate data structure for ease of computation and graphic display of results
7. The script should process the relevant data to identify the top 3 countries in the region over a span of 10 years.
8. The project should also include a Test Case with appropriate Test function(s) to test your application.
9. Finally, a presentation is required to share your insights.

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## Project Scenario 2

*Best Cyber Pte Ltd* has just clinched a deal from an important client *ABWeb Pte Ltd*. The project is to create an application to perform penetration testing on their website to determine vulnerability.

*ABWeb* believes that Python is one of the most appropriate programming languages for to be used for pen-testing. *ABWeb* is expecting to use Python to create script(s) to perform the first two step of pen-testing namely reconnaissance and mapping.

Being an experienced Pen-Tester, you have been tasked to work with two other cyber-security specialists to develop a script to perform the task. The script should include test cases, results and technical documentation for this project.

## Tasks

1. Create a project named DA\_<Group Name> with script(s) to use Python version 3.0 or higher.
2. The project should include Version Control Systems (VCS) for team collaboration. The team is expected to demonstrate on how to create or update project and script(s) to VCS (Github).
3. The project should import appropriate libraries in the script.
4. The uniform resource locator should be correctly defined for the imported library class to retrieve the relevant data.
5. The script needs to demonstrate the following reconnaissance procedure:
  - i. Perform a “get” request on the given website
  - ii. Display an “OK” return status
  - iii. Display the Website header
  - iv. Modify the Header user-agent to display “Mobile”
6. Modify the script to perform mapping on the website in the following manner:
  - i. Use Scrapy web-crawler with appropriate parser “response.css”
  - ii. Display reference webpage
  - iii. Store the retrieve information in JSON
7. Perform the modification to the script to recursively extract JPG images on all known links. Display the list of image links.
8. The project should also include a Test Case with appropriate Test function(s) to test your application.
9. Finally, a presentation is required to share your insights.

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