Experiment 1

Title

Fundamentals of Python Programming and Setting Up Jupyter Notebook via Anaconda Distribution

Purpose

To gain knowledge of Python programming fundamentals, comprehend the environment in which Python operates, set up Python alongside Jupyter Notebook through the Anaconda platform, and investigate multiple Python development tools including Google Colab.

Goals

- To comprehend the capabilities and practical applications of Python
- To configure Python and Jupyter Notebook using the Anaconda package
- To examine different Python integrated development environments and platforms
- To run elementary Python code through Jupyter Notebook as well as Google Colab

Conceptual Background

1. Overview of Python

Python represents a sophisticated, dynamically executed, and procedural programming language extensively applied in data processing, artificial intelligence, task automation, and computational science.

2. Understanding Anaconda

Anaconda functions as a cost-free, publicly available compilation of Python and R intended for machine learning and information science applications.

Key Benefits of Anaconda:

- Contains pre-loaded Python, Jupyter Notebook, Spyder, and essential libraries
- Facilitates straightforward library and workspace administration
- Prevents compatibility and versioning complications
- Appropriate for both beginners and experienced professionals

3. Getting Started with Anaconda and Jupyter Notebook

Phase-1: Obtain Anaconda

1. Navigate to the primary Anaconda portal: https://www.anaconda.com
2. Select **Get Started** and pick **Anaconda Community Edition**
3. Opt for **Python 3.x** that aligns with your platform requirements

Integrated Development Environments for Python

Environment	Purpose
IDLE	Fundamental Python environment
Spyder	Data Science Python environment (comes with Anaconda)
PyCharm	Enterprise-level Python environment
VS Code	Minimalist programming instrument
Jupyter Notebook	Exploratory analytical computing interface

Cloud-Based Python Platform: Google Colab

Google Colab represents an internet-accessible Python workspace made available by Google.

Strengths:

- No setup process needed
- Free access to GPU and TPU resources
- Simplified teamwork and sharing
- Functions entirely within web browsers

Getting Started with Google Colab:

1. Go to https://colab.research.google.com
2. Log in with your Google credentials
3. Start a fresh Python workspace

Summary

Python delivers a sophisticated and adaptable computation framework. Jupyter Notebook and Google Colab make it easier to engage in coding education and exploratory information examination by enabling step-by-step execution and graphic presentation features.