Configuration Manual

1. Introduction and Purpose

This Configuration Manual provides detailed instructions on setting up and configuring the software, tools, and systems used in the thesis titled "Multi-Cloud: Assessing Resilience Amid Threats." The manual is intended for researchers, IT professionals, and students who wish to replicate the study, verify the results, or apply the developed models and methods to their own work.

2. System Requirements

2.1 Hardware Requirements

- **Processor**: Intel i5 or equivalent
- **RAM**: 8 GB minimum, used – 16 GB used
- **Storage**: 20 GB of free disk space
- **Network**: Broadband internet connection for downloading software and accessing cloud services

2.2 Software Requirements

- **Operating System**: Windows 10, macOS, or Linux – Windows 10 used
- **IBM SPSS Statistics**: Version 26 or higher
- **Python**: Version 3.7 or higher
- **Visual Studio Code**: For Python code review and execution
- **Python Libraries**: pandas, numpy, matplotlib.pyplot, seaborn

2.3 Network Requirements

- **Internet Access**: Required for software downloads, updates, and accessing online resources
- **Firewall Settings**: Ensure necessary ports for internet access are open

3. Installation Instructions

3.1 Installing IBM SPSS Statistics

1. **Download SPSS**: Visit the IBM website (https://www.ibm.com/products/spss-statistics) and download the appropriate version of IBM SPSS Statistics for your operating system.
2. **Install SPSS**: Follow the installation prompts to install SPSS on your machine.
3. **License Activation**: Activate the software using the license key provided by your institution or purchase a license through IBM.

3.2 Installing Python and Visual Studio Code

1. Download Python: Visit the Python website (https://www.python.org/downloads/) and download the latest version of Python.
2. Install Python: Follow the installation prompts, ensuring that you check the option to "Add Python to PATH".
3. Download Visual Studio Code: Visit the Visual Studio Code website (https://code.visualstudio.com/) and download the latest version for your operating system.
4. Install Visual Studio Code: Follow the installation prompts to install Visual Studio Code.
5. Install Python Extension for Visual Studio Code:
    - Open Visual Studio Code.
    - Go to the Extensions view by clicking on the Extensions icon in the Activity Bar on the side of the window.
    - Search for "Python" and install the Python extension by Microsoft.

3.3 Installing Required Python Libraries

Run the following commands in your terminal or command prompt:

pip install pandas numpy matplotlib seaborn

4. System Configuration

4.1 Initial Configuration

1. **SPSS Configuration**:
- Open IBM SPSS Statistics.
- Set your working directory to the folder containing your dataset and SPSS syntax files.
- Load your dataset into SPSS by navigating to “File > Open > Data” and selecting the appropriate file.
- Switch to the variable view to configure the variable as scale, nominal or ordinal. Also set your decimals appropriately

2. **Python Environment Configuration**:
- Ensure that all necessary Python libraries are installed by running the provided installation commands.

4.2 Customization

- **SPSS Syntax**: Modify the provided SPSS syntax files to reflect your specific dataset locations and parameters.
- **Python Scripts**: Adjust the Python scripts to match your data processing and analysis needs.

4.3 Testing the Setup

1. **Run Test Scripts**:
- Use the provided SPSS syntax files to run test analyses and verify that the environment is correctly configured.
2. **Check Output**:
- Verify that the output from test scripts and SPSS matches expected results, such as correctly calculated resilience scores and visualizations.

5. Usage Instructions

5.1 Running the Analysis

1. **IBM SPSS Analysis & Statistics**:
    - Load your dataset into SPSS.
    - Open the provided SPSS syntax file (Enterprise_ResiliencE.sav).
    - On SPSS main menu, go to Analyze > Regression > Linear
    - In the pop up, select the dependent variable(Resilience Score) and populate the independent variables(predictors) in the predictors block
    - Click Statistics and make sure “Estimates, Model Fit and R Squared change” are selected and click “Continue”.
    - Click Plot and from the DEPENDENT block, drag “*ZPRED” to the X-axis and the “*ZRESID” to the Y-axis. Click “Continue” and click “Ok”
    - This will run and perform the multiple linear regression test.
    - View and export the results as needed.

5.2 Advanced Features

- **Custom Data Inputs**: Modify the CSV files or SPSS datasets with your data to run custom analyses.
- **Parameter Tuning**: Adjust regression model parameters within the SPSS syntax or Python scripts to test different scenarios.

5.3 Troubleshooting

- Make sure your variables are well defined in the variable view
- **Common Errors**: Refer to the troubleshooting section for solutions to common issues such as SPSS syntax errors, Python library installation problems, or script execution failures.
- **Error Logs**: Review error logs generated by SPSS and Visual Studio Code for detailed information.

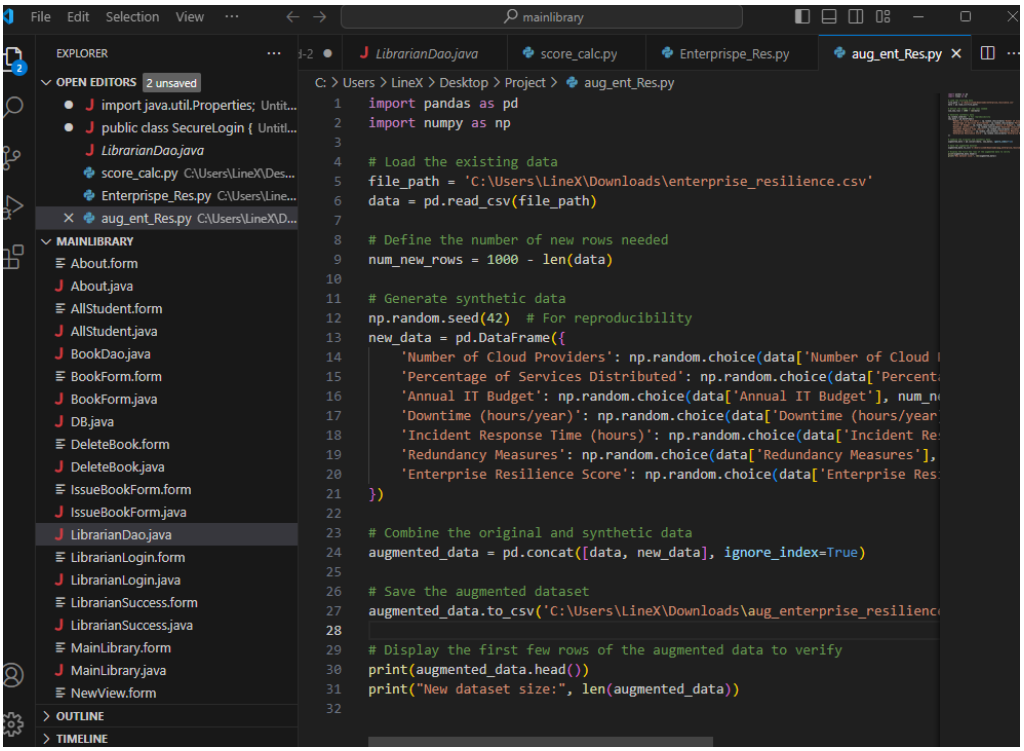
6. Maintenance and Updates

6.1 Regular Maintenance

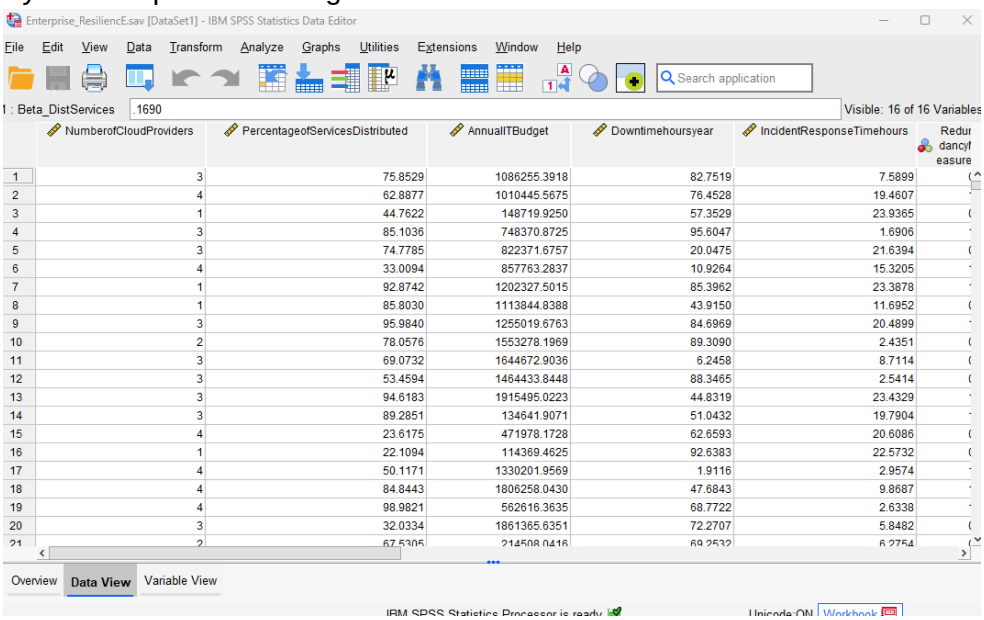
- **SPSS and Python Updates**: Regularly update IBM SPSS and Python libraries to the latest versions to ensure compatibility and access to new features.

- **File Management**: Organize and back up your SPSS datasets, syntax files, and Python scripts regularly to prevent data loss..

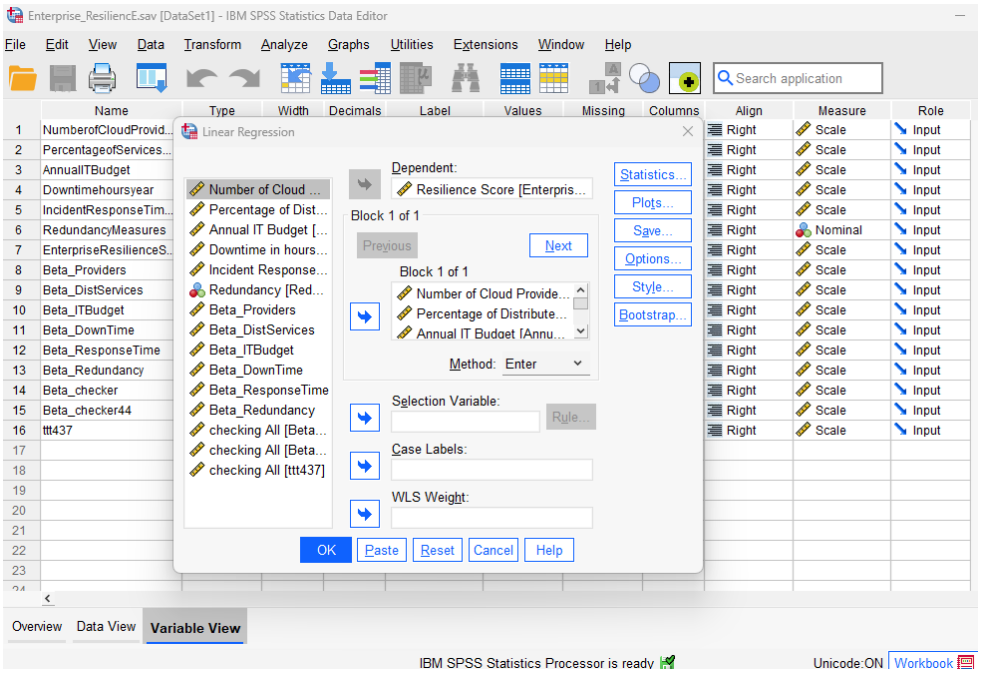
Appendix



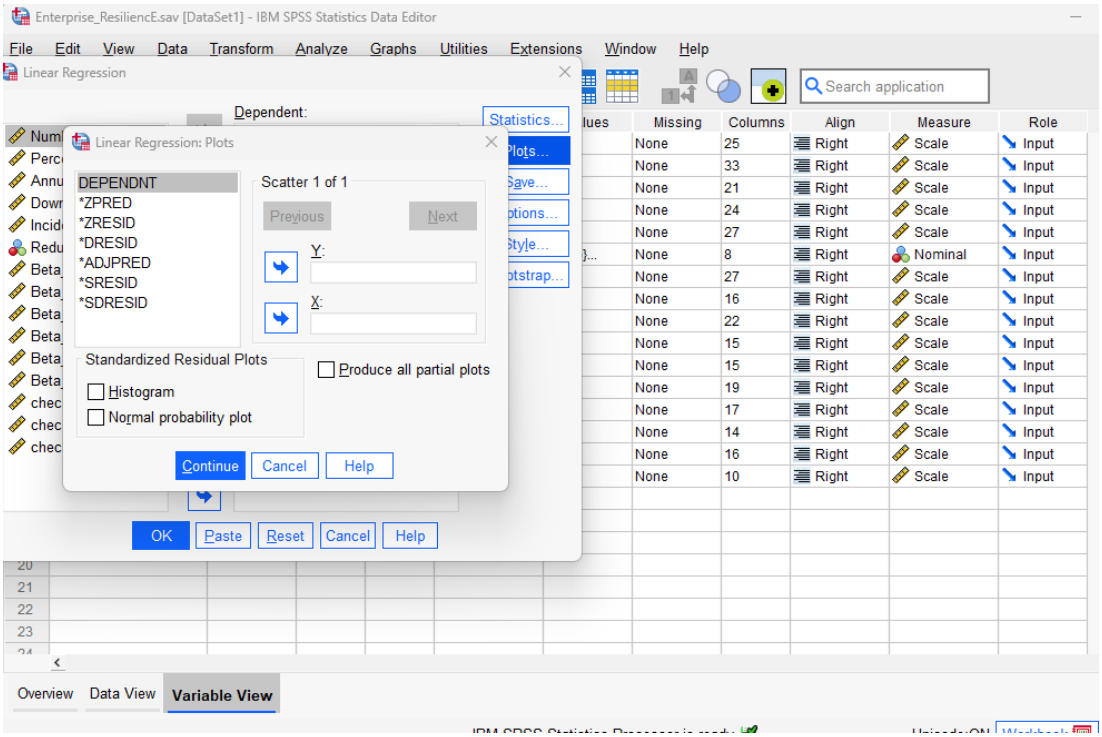
Python Script for data augmentation



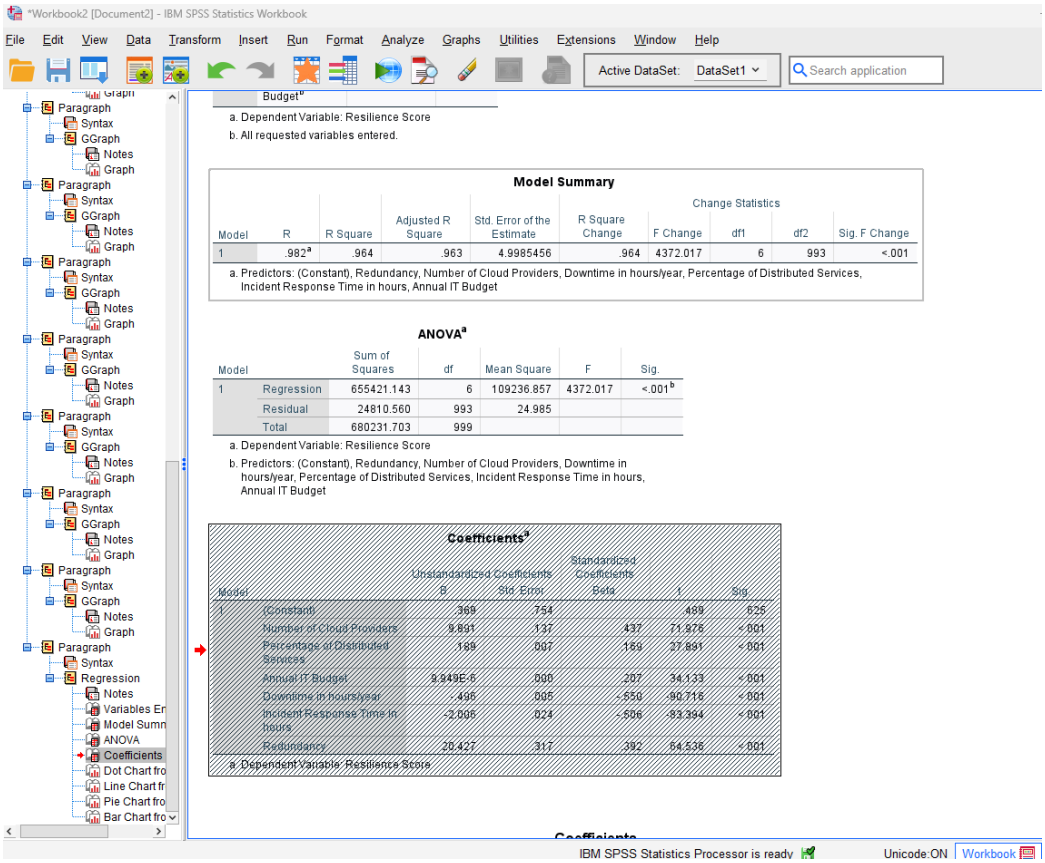
SPSS Data view



Configuring dependent variable and independent variables in SPSS



SPSS Plot setting



SPSS Output panel