Maverick : Outlier Analyzer Tool

Package Requirements

python3 (anaconda version) ; pandas (v0.25.1 +) ; numpy (v1.15.4 +) ; scikit-learn (v0.19.1 +) ; Jsonpickle (v1.0 +) ; matplotlib (v2.1.1 +) ; networkX (v2.3) ; pybatfish (v0.36.0)

Downloading the Tool

1) git clone git@github.com:vasu018/outlier-analyzers.git

Running the Tool

1) Open Terminal inside the folder "outlier-analyzers/outlier-analyzer-wrapper"
2) Type "python3 outlier_analyzer.py" to run the code
3) Choose the appropriate option out of the Eight Menu Options (mentioned below)

Menu Options Explained

Num	OPTION NAME	FUNCTIONALITY
1	CALCULATE OUTLIERS - ACL_Lists	Main option to start checking for outliers in a network configuration. This option treats the Data as ACL Lists as a whole.
2	CALCULATE OUTLIERS - ACLs	Main option to start checking for outliers in a network configuration. This option treats the Data as ACLs to get more fine grained results.
3	EDIT OUTLIERS	After running option (1)/(2), this option can be used to initiate Signature Re-Tuning Process in case of False Positives
4	VIEW OUTLIER NODES	After running option (1)/(2) we can use this option to view the outlier nodes for the respective network configuration.
5	DEVIANT PROPERTIES PLOT	After running option (1)/(2) we can use this option to plot all the deviant properties occurring in the network configuration with their respective frequencies.
6	SCORING COMPARISON PLOT	After running option (1)/(2) we can use this option to plot and visualize the Similarity Scores of ACLs with their respective Signature Scores.
7	RUN RANKING MODULE	After running option (1)/(2) we can use this option to run the ranking and severity module to get the rankings of the outliers.
8	EXIT APPLICATION	Option to exit from the tool

Explaining Options

Steps: Option 1

a) Enter the complete named-structure filename with complete path. Press Enter
b) Enter '0' to select Modified Z-Score or '1' for Standard Z-Score. Press Enter
Output: A folder is created with the name "outliers_network_name" with outlier file inside.

Steps: Option 2

a) Enter the complete named-structure filename with complete path. Press Enter
b) Enter '0' to select Modified Z-Score or '1' for Standard Z-Score. Press Enter
Output: A folder is created with the name "outliers_network_name" with outlier file inside.

Steps: Option 3

a) Enter the complete named-structure filename with complete path. Press Enter
b) Enter the complete Exception filename with complete path. Press
Enter Exception File Format: [.pickle file]
```
{
'deviant': [
            ('key1', 'value1'),
            ('key2', 'value2'),
            .
            .
            .
            ('key_n', 'value_n')
            ]
}
```
Output: Signatures are Retuned

Steps: Option 4

a) Enter the complete named-structure filename with complete path. Press Enter
Output: Outlier Nodes Printed

Steps: Option 5

a) Enter the complete named-structure filename with complete path. Press Enter
Output: Plot Displayed

Steps: Option 6

a) Enter the complete named-structure filename with complete path. Press Enter
Output: Plot Displayed

Steps: Option 7

a) Enter the Directory Path of the Original Network to Run Severity Module on. Press Enter
Output: Severity and Ranking Menu Opens

Steps: Option 8

Exits Application
Output: Application Stops

Ranking Options:

Option 1: Display Top Outliers
  Display all the details of the top 5 outliers ranked by severity scores.

Option 2: Found Bug
  Asks the user for the outlier_id of the bug. It will increase the severity scores of all the outliers belonging to the same cluster as this bug by 10%.

Option 3: Found FP
  Asks the user for the outlier_id of the FP. It will decrease the severity scores of all the outliers belonging to the same cluster as this FP by 10%.

Option 4: Display all outliers
  Displays all the outliers.

Option 5: Exit
  Exit the ranking module.