ASSIGNMENT #4

NES 470, Fall 2023, Dr. Ahmad T. Al-Hammouri

Due date: Thursday 21/12/2023 at 11:55pm.

Objectives:

To acquire applied practical knowledge about the SNMP message encoding.

Problem Statement:

In this assignment, you will develop a **Python** utility program that **decodes** a SNMP message and displays the information it contains in a well-formatted, readable fashion. This is similar to the task performed by a NMS/manager under the hood for each SNMP message it receives. To accomplish this task, you need to first master the Basic Encoding Rules (BER) and how different SMI data types are encoded inside SNMP messages that we covered in class.

The script requirements are as follows:

1. The script accepts a **single** command line argument: a name of text file that contains the **Hex dump** of the **bytes** of **one** SNMP message, e.g., `msg.txt`. For example, the script will be run as follows

    `python3 ./ID-xxxxxx.py msg.txt`

    where 'xxxxxx' is your students ID.

    The format of the file contents is as follows

    ```
    30 3c 02 01 01 04 06 70 75 62 6c 69 63 a0 2f 02
    04 38 98 7d cf 02 01 00 02 01 00 30 21 30 0e 06
    0a 2b 06 01 02 01 02 02 01 06 03 05 00 30 0f 06
    0b 2b 06 01 02 01 1f 01 01 01 06 01 05 00
    ```

2. The script will be executed on a Linux machine.

3. The script displays on the standard output the following information for the SNMP message: the size of the SNMP message in bytes, the SNMP version, the community string, the PDU type, the request ID, the error status, and the error index.

4. The output must be in the following format (the values below are the correct information for the SNMP message bytes above):

    ```
    Field              Value
    ---------------    -----------
    Size of Message    62 Bytes
    Version            2
    Community          public
    PDU Type           Get Request
    Request ID         949517775
    Error Status       0
    Error Index        0
    ```

5. *You are allowed to use **ONLY** the Python Standard Library,* but **not** *any other libraries developed by any third party.*

Hints:

1. As said in the Problem Statement above, you need to first master the Basic Encoding Rules (BER) and how different SMI data types are encoded inside SNMP messages that were covered in class.

2. To produce more test cases to verify the correctness of your code, use wireshark to capture SNMP request and reply packets. Highlight the SNMP portion of a given packet, right click, and select "Copy Bytes as Hex Dump". Finally, you need to remove the bytes offsets, i.e., the first column.

3. Do not assume that the **value** or the **length** of any field is fixed.

Grading Policy:

- You must turn in only **working code**. If your code gives run-time errors, you will receive **zero** credit.

- Partial credit is given only for working code that does not implement all the requirements above.

- *Part of your score will depend on the well formatting of the output.*

Deliverables:

- Name the script file as follows `ID-xxxxxx.py`, where 'xxxxxx' is your students ID.

- Submit **ONLY** the Python script file to the `elearning` via the provided link. Do **NOT** send it via e-mail or a message from within the `elearning` even before the deadline because it will be deleted tacitly.

- ONLY one student from each group must submit the file.