Assignment #2
NES 470, Spring 2023, Dr. Ahmad T. Al-Hammouri

Objectives:

To develop a network management application utilizing the SNMP operations provided via the Easy SNMP Python APIs.

Problem Statement:

In this assignment, you will develop a **Python script** that acts as a minimalist network management application. The network management application interrogates the SNMP agent for the **ARP cache** information and displays them in a convenient, well-formatted manner.

The script requirements are as follows:

1. The script accepts the following **two** command line arguments
   - The read-only community string of the agent, e.g., `public`.
   - The IP address of the machine/device where the agent is running, e.g., `192.168.1.101`.

   For example, the script will be run as follows
   `./ID-xxxxxx.py  public  192.168.1.101`
   where 'xxxxxx' is your students ID.

2. The script sends appropriate SNMP requests to the SNMP agent, and retrieves the information about the **ARP cache** table on the router.

3. The script displays on the standard output the IP address, the corresponding MAC address, the interface, and the type of mapping. The output must be in the following format

   ```
   IP Address     MAC Address        Interface        Mapping Type
   ------------   -----------------  ---------------  ------------
   10.0.2.2       52:54:00:12:35:02  GigabitEthernet1 Dynamic
   192.168.1.1    e8:6e:44:19:aa:38  GigabitEthernet3 Dynamic
   10.0.2.15      08:00:27:48:bb:1f  GigabitEthernet1 Static
   192.168.1.19   08:00:27:eb:7e:1f  GigabitEthernet3 Static
   ...
   ```

4. *You are allowed to use the two EASY SNMP methods:* `get` *and* `get_next` ***ONLY***, but **not** any of `walk`, `get_bulk`, or `bulkwalk`.

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

Hints:

1. Your best friends in this assignment are both the `IP-MIB` and `IF-MIB` MIB modules. In the `IP-MIB` MIB module, you may need to focus only on `ipNetToPhysicalTable`.

2. Do not assume that the number of entries, the IP addresses, the MAC addresses, the interfaces, and other data are fixed and do not change from one device to another or over time.