Installation and Execution Guide for Tendo_GUI.py:

In this guide, we will walk through the steps required to install the necessary libraries on a Raspberry Pi and execute the "Tendo_GUI.py" script. The script uses the following Python libraries:

- Python 3.7.7
- MinimalModbus 2.0.1
- PyQt5 5.11.3
- PyQtGraph 0.10.0
- NumPy 1.21.6

I. Installing the Required Libraries:

1. Update and Upgrade Raspberry Pi:

   Open a terminal window on your Raspberry Pi and execute the following commands to update and upgrade your system:

   ```
   sudo apt update
   sudo apt upgrade
   ```

2. **Install Python 3.7.7:**

   To install Python 3.7.7, execute the following commands in the terminal:

   ```
   sudo apt install -y python3.7
   sudo apt install -y python3.7-venv
   ```

   Check the Python version to ensure it's installed correctly:

   ```
   python3.7 --version
   ```

3. **Create a Python Virtual Environment:**

   It's a good practice to create a virtual environment for managing Python packages. To do so, execute the following commands:

   ```
   python3.7 -m venv tendo_env
   source tendo_env/bin/activate
   ```

4. **Install the Required Libraries:**

With the virtual environment activated, install the necessary Python libraries using

```
pip install minimalmodbus==2.0.1
pip install pyqt5==5.11.3
pip install pyqtgraph==0.10.0
pip install numpy==1.21.6
```

II. Running the Tendo_GUI.py Script:

Now that the required libraries are installed, we can run the "Tendo_GUI.py" script. The script accepts the following command-line arguments:

```
--port: Serial port (default: /dev/ttyUSB0)
--adr: Modbus address (default: 1)
```

1. Download the Tendo_GUI.py Script:

Download the "Tendo_GUI.py" script and save it in a directory on your Raspberry Pi.

2. Execute the Script:

Navigate to the directory where you saved the "Tendo_GUI.py" script and run it with the desired command-line arguments. For example, if you want to use the default arguments, execute the following command:

```
python Tendo_GUI.py
```

If you want to specify custom arguments, use the following format:

```
python Tendo_GUI.py --port <port> --adr <modbus_address>
```

Replace <port> and <modbus_address> with the appropriate values.

That's it! The Tendo_GUI.py script should now be running on your Raspberry Pi with the specified arguments.

Important Note:

If you encounter a message like the following after running the script:

```
could not open port '/dev/ttyUSB0'

Traceback (most recent call last):
  File "... /Tendo_GUI.py", line 582, in <lambda>
    self.StartButton.clicked.connect(lambda: self.setRH(43, 1, "u16bit"))
  File "... /Tendo_GUI.py", line 786, in setRH
    self.instr.write_register(addr, data)
AttributeError: 'NoneType' object has no attribute 'write_register'
```

This means you either didn't specify the --port argument correctly or the USB device is not plugged in. Make sure the USB device is connected and the correct port is specified as an argument when running the script.

END.