Windows Laptop Battery Capacity Report and Battery Monitor script

A presentation by
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For PATACS 1st Wednesday
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AGENDA

- Why this topic is useful to you
- How to create the report
- How to read the report, and what the report showed me
- Minimize battery capacity loss by using prudent charging behavior
- Download a zero-cost Basic script to notify you when to start and stop charging to preserve your battery capacity

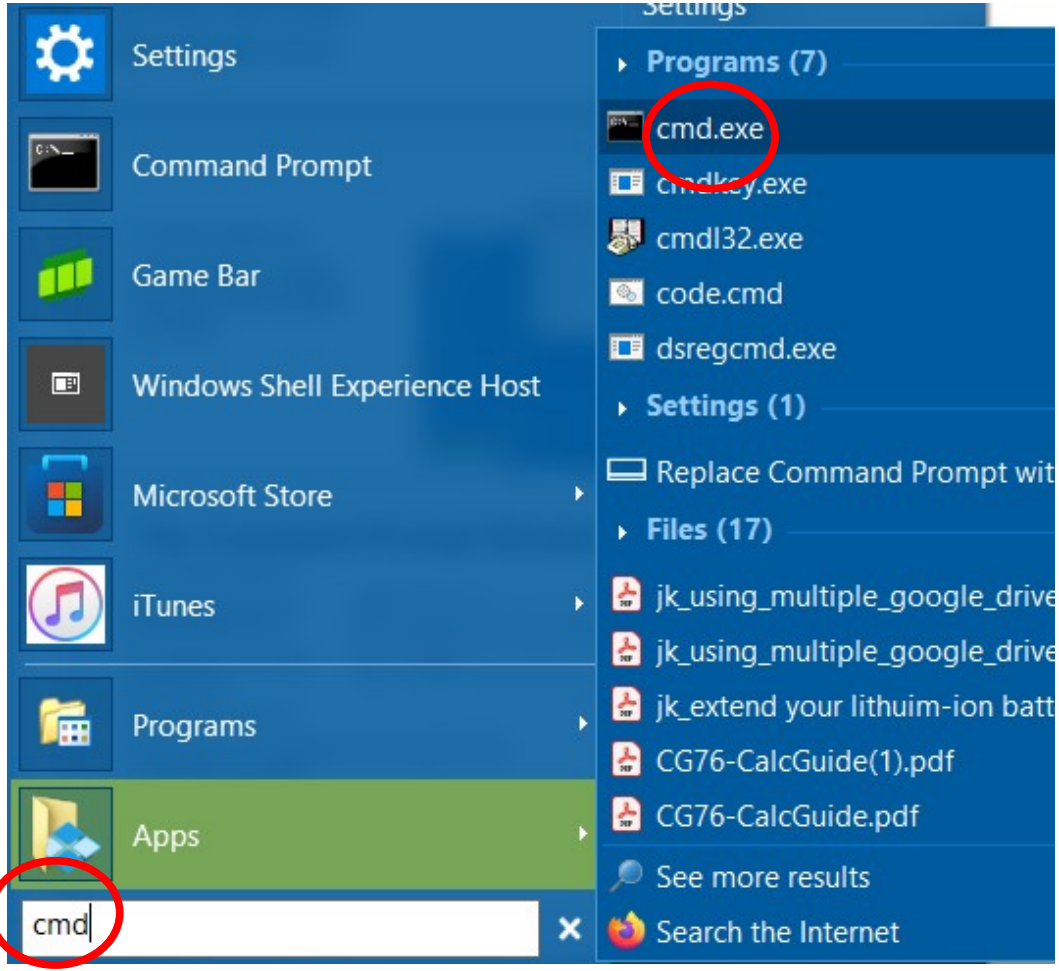
Why This Topic is Useful

- Windows laptop batteries are no longer easily accessed and replaced.
- Windows laptop battery capacity loss over time makes use on battery power a very short experience.
- Windows laptop batteries can be replaced with some effort. Many are in stock at MicroCenter and on Amazon.
- You can avoid that expense for many years by using prudent charging behavior.

How to create the Battery Report

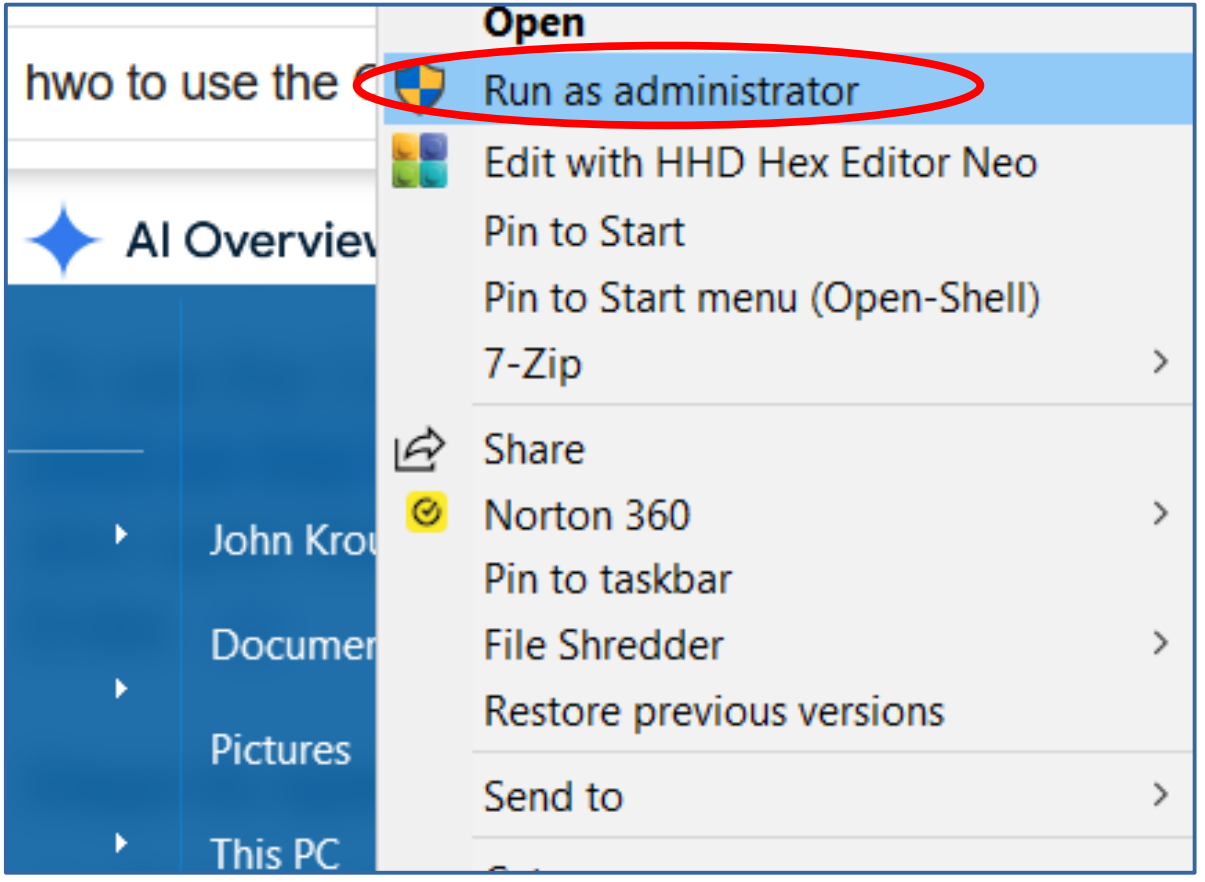
Step by Step

- Open the **Windows Start Menu.**
- In the Search field at the bottom, type **cmd**, circled in the screen capture at its lower left corner.
- The menu displays the **Command Prompt or cmd.exe** as the top choice, also circled.
- **Right**-click that choice.



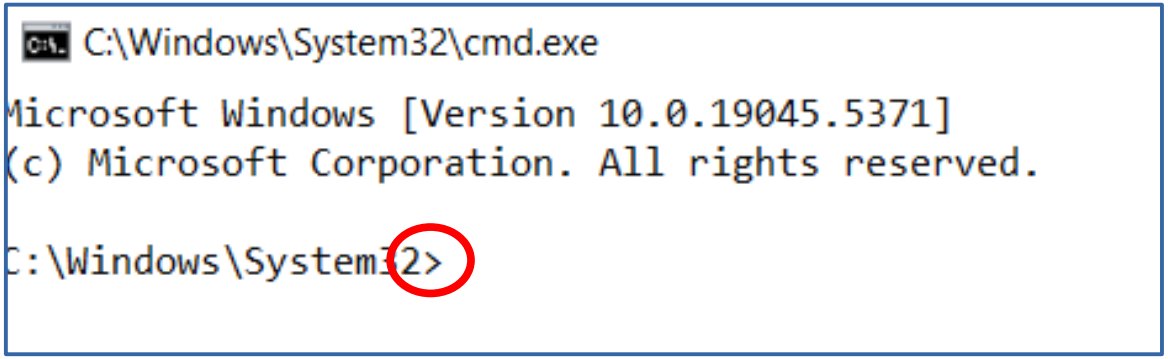
Run the Command Prompt as Adminstrator

- A menu pops up.
- In that menu, select **Run As Adminstrator** (circled)
- The menus close, and a new window opens.



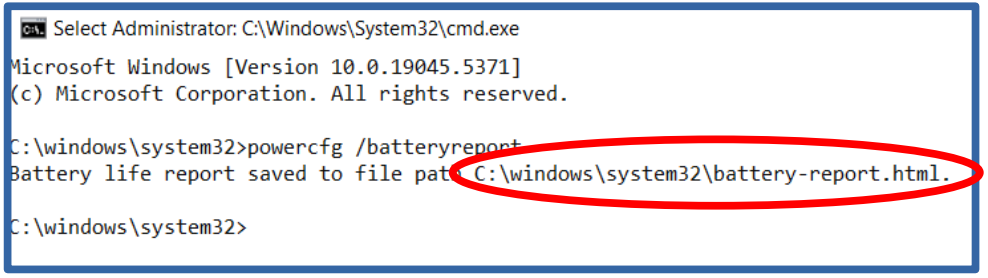
The Command Prompt Window

- This is the Command Prompt window.
- I have mine pre-set to a white background.
- The default is a black background.
- Either way, it works.
- A blinking cursor appears to the right of the **>** character (circled).



The Command Prompt Window

- Select the Command Prompt window.
- Type this command: **powercfg /batteryreport** and tap the Enter key.
- The command you type appears to the right of the > character.

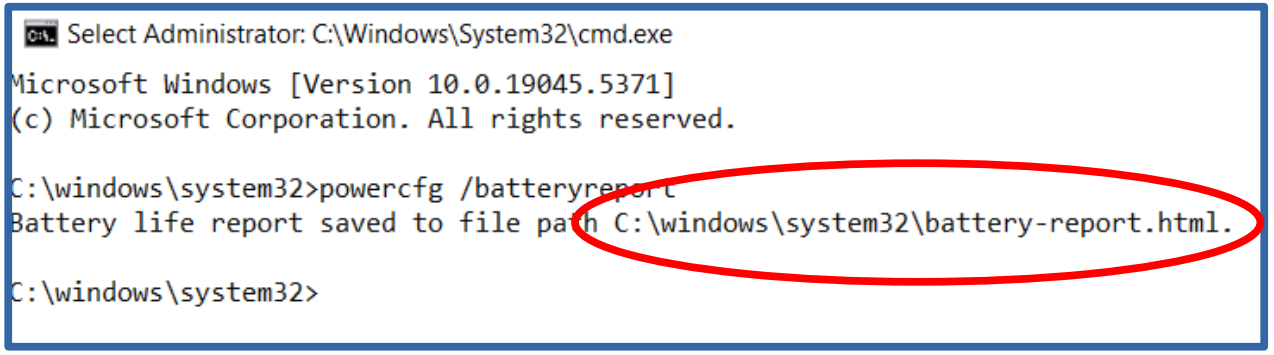


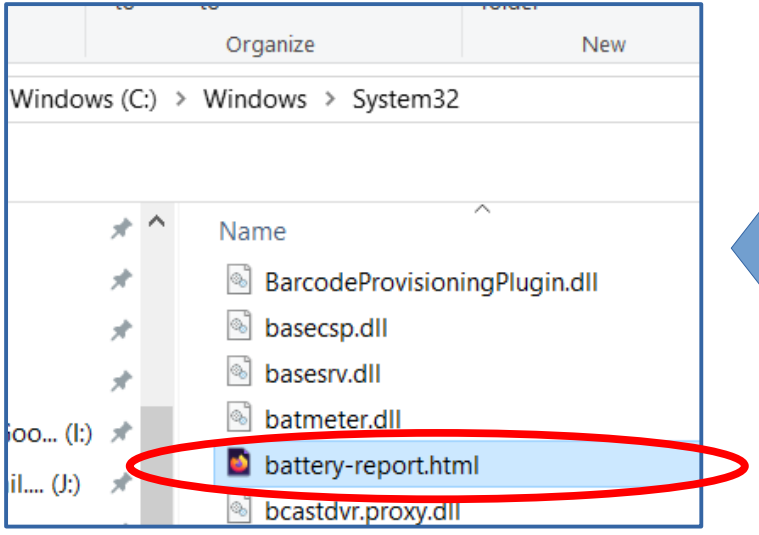
- After the computer creates and stores the report, it tells you the folder path in which to find the report (circled).

How to Read the Report

The Command Prompt Window

- Use Windows Explorer to follow that path.
- Find and double-click the file name **battery-report.html**.
- The report file opens in your default web browser.

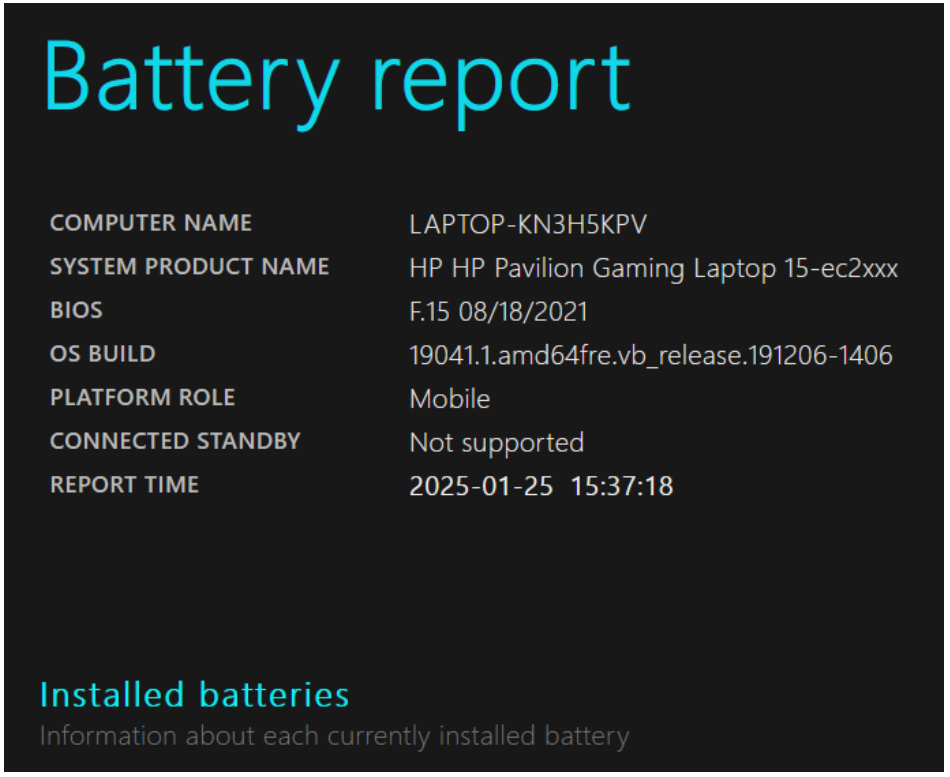




Explorer

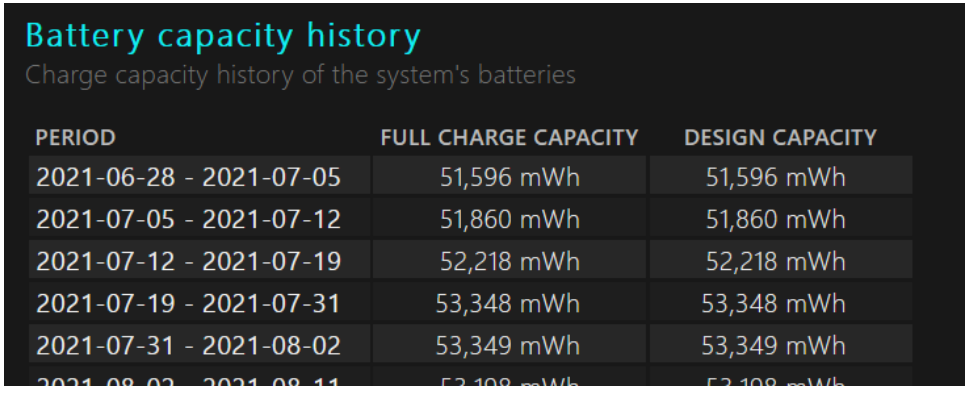
It is a long report

- Here you see the top of the report.
- The battery capacity portion is not near the top.



Find the Battery Capacity History section

- The battery capacity portion is near the middle.
- In your browser, tap CTRL+F to open a Search field.
- In that field, type **battery capacity history**



Battery capacity history

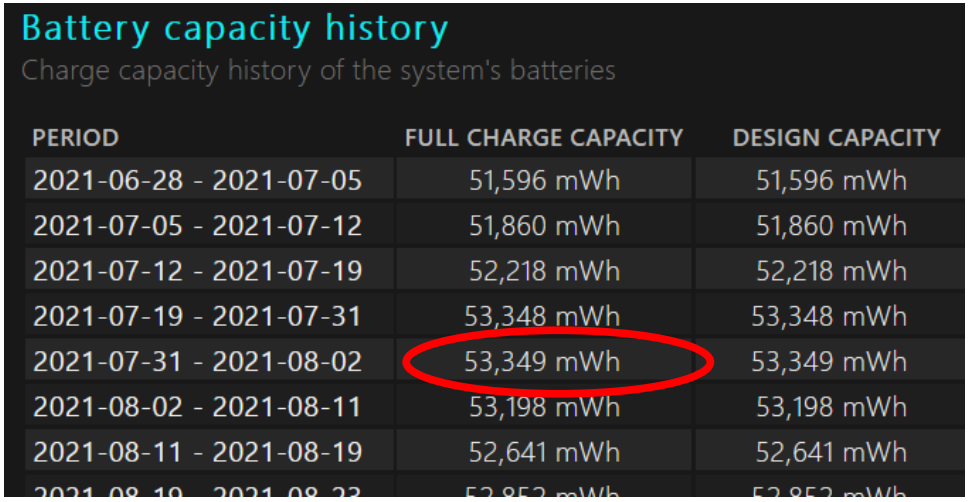
Charge capacity history of the system's batteries

PERIOD	FULL CHARGE CAPACITY	DESIGN CAPACITY
2021-06-28 - 2021-07-05	51,596 mWh	51,596 mWh
2021-07-05 - 2021-07-12	51,860 mWh	51,860 mWh
2021-07-12 - 2021-07-19	52,218 mWh	52,218 mWh
2021-07-19 - 2021-07-31	53,348 mWh	53,348 mWh
2021-07-31 - 2021-08-02	53,349 mWh	53,349 mWh

- Tap the Enter key to begin the search.
- Here you see the top of that report section, found using the search field as described here.

The first surprise

- The report showed that my laptop battery capacity ***increased*** during the first few weeks of use in 2021.
- I circled the max capacity value: **53,349 mWh.**



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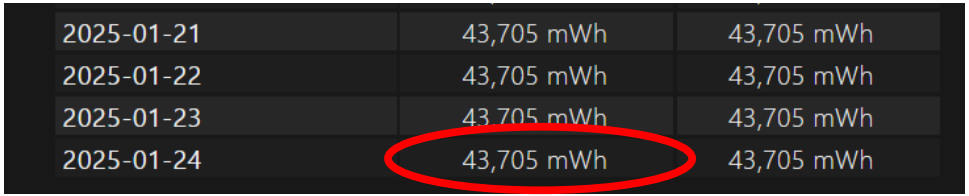
2021-07-31 - 2021-08-02	53,349 mWh	53,349 mWh
2021-08-02 - 2021-08-11	53,198 mWh	53,198 mWh
2021-08-11 - 2021-08-19	52,641 mWh	52,641 mWh

- The unit of measure, mWh, is milliWatt-hours.
- The laptop battery peaked at over 10 times the capacity of my smartphone battery.

Scroll Down to the Section End

- The most recent capacity appears there.



2025-01-21	43,705 mWh	43,705 mWh
2025-01-22	43,705 mWh	43,705 mWh
2025-01-23	43,705 mWh	43,705 mWh
2025-01-24	43,705 mWh	43,705 mWh

- In my case, on 1/24/2025, the capacity was reduced to **43,705 mWh** (circled).
- That is a **19% reduction** compared to the max value.

Prudent Charging Behavior

Prudent Charging Behavior

- Do not allow the battery to discharge below 20%. Start charging there.
- Do not charge the battery above 80%. Stop charging there.
- Charging in the 0%-20% range, and the 80%-100% range, heats the battery.
- Heat changes part of the battery chemistry to a form that cannot work as a battery.
- Apply that normal charging heat often enough, and your battery is a goner.

A Visual Basic Script for Laptop Battery Level Alarms

Visual Basic scripts

- Google says Visual Basic was introduced in Windows in 1991. It is probably on any Windows laptop you now use.
- Visual Basic scripts are sometimes called VBscripts.
- The filename extension is VBS.
- I found a simple alarm script online.
- I augmented it quite a bit, and fixed a bug.

Battery alarm methods

- The basic approach is to have the script sleep for a fixed time, such as 5 minutes; wake up and test for alarm conditions, which takes about 1 second.
- If no alarm conditions exist, then repeat the process.
- If an alarm condition does exist, then tell the laptop user and then repeat the process.
- A very important part of such a script is to avoid being the cause of a battery running out of power.
- The sleep periods help minimize the script use of battery power.

Why a variable sleep period is useful

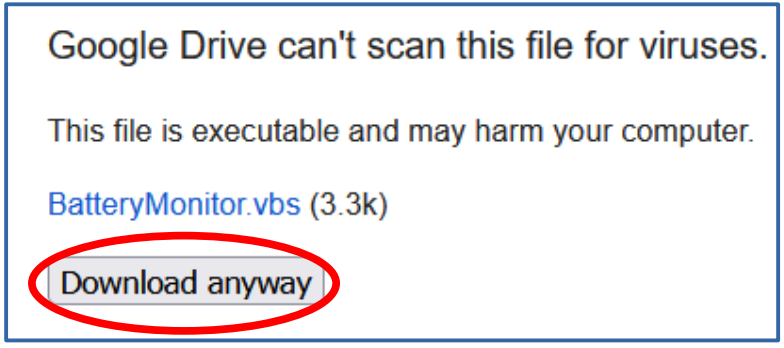
- Using a fixed length sleep period, a battery monitor will miss its high-level or low-level limit by an average of half the sleep period.
- In the BatteryMonitor.vbs script, a 5-minute sleep period will miss (exceed) the limit by an average of 2 minutes 30 seconds. The miss could be more than that, as much as 4 minutes 59 seconds.
- My laptop battery charger pretty fast, so a miss of the average length would allow the battery charge to go well above 80%.

Why a variable sleep period is useful

- As augmented, the script switches to a 30 second sleep period when it recognizes the battery level is close to a limit.
- The average miss of a limit is therefore 15 seconds and the worst is 29 seconds.

How to obtain the improved VBscript

- I posted the improved VBscript on one of my Google Drives, and set its permissions for anyone to download it.
- Here is the download URL: **https://tinyurl.com/mwpsevsd**
- Google will tell you that Google is unable to check the script for viruses, like this.



- Click the **Download Anyway** button.

The file BatteryMonitor.vbs

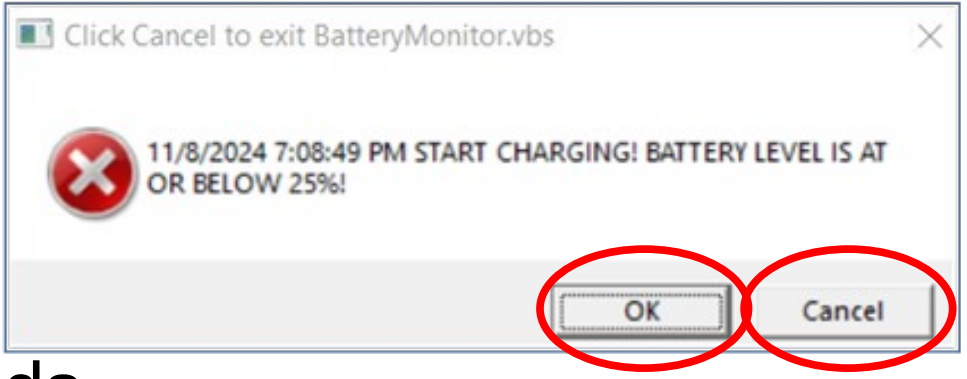
- Find the file in the Downloads folder.
- Copy that file, and paste it in your Desktop folder. This is the icon on the Desktop.

- To start the VBscript, double-click its icon.
- It announces startup using this short-duration dialog box and the female Windows Narrator voice.

When the script reports a charge level limit is reached

- Each message box stays on the screen for 5 seconds.

- If you do not tap a message box button in 5 seconds, then the box will close and the script will continue will repeat the dialog box every 60 seconds.



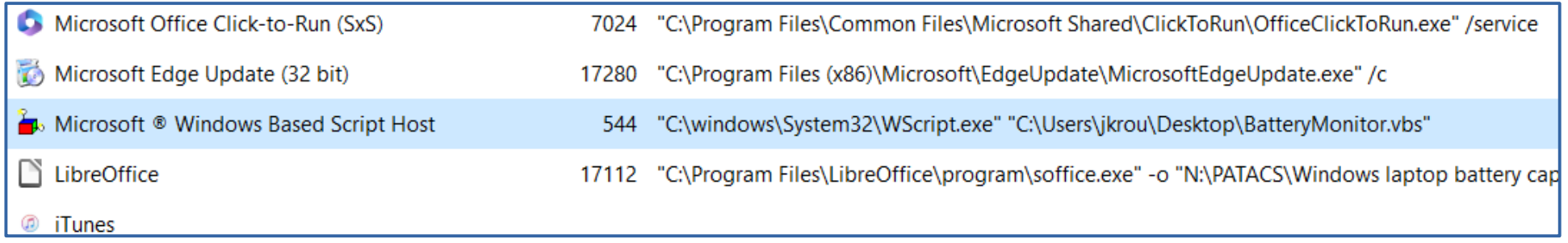
- Tap the **OK button** so the script will continue.
- Tap the **Cancel button** to kill the script.

BatteryMonitor.vbs charge limits

- The script is configured to announce Start Charging at 25% and Stop Charging at 75%.
- Why not use 20% and 80%?
- When a limit is reached, you might be talking on the phone or away from the laptop.
- The script continues to announce the limit every 60 seconds until you click OK and either start or stop charging.
- Using 25% and 75%, you have five minutes to take action before battery charging will harm your battery.

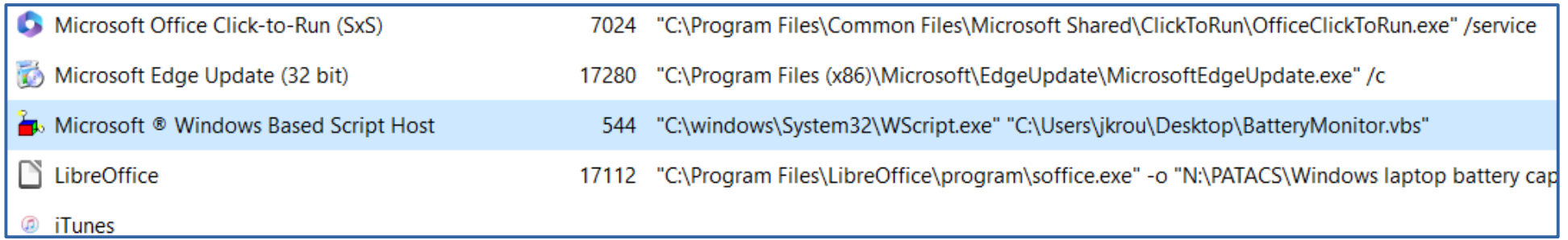
Script shutdown using Task Manager

- In Task Manager, click the top of the **Name column**, so the process names appear in alpphabetic order.
- In BackGround Processes, find **Microsoft Windows Based Script Host** in that Name column.
- In that row, look at the Command Line column. The text in that column ends with **BatteryMonitor.vbs**



Script shutdown using Task Manager

- Click that row to highlight it, like you see in the screen capture.
- In the lower right corner of the Tzsk Manager window, click the **End Task button.**
- The row disappears from the task list.



Reconfiguring BatteryMonitor.vbs

- You can edit the BatteryMonitor.vbs file using Notepad or any text editor.
- You can adjust the sleep interval, the alarm dialog box timeout, the voice gender, the voice enunciation speed, and the battery charge level alarm levels.
- The next slide shows you the lines in the file where those values appear.
- I recommend that you to make a backup of the original BatteryMonitor.vbs file, so you can restore it if your modifications break its behavior.

Reconfiguring BatteryMonitor.vbs

- Line 15: High battery charge level 75 (percent)
- Line 16: Low battery charge level 25 (percent)
- Line 24: voice enunciation rate -3
  (valid values are -10 slowest to 10 fastest)
- Line 25: voice gender (1 for female, or 0 for male)
- Line 27: alarm dialog box timeout 5 (seconds)
- Line 32: sleep interval 300,000 milliseconds
  (5 minutes)

THE END