How to Automate AHRQ Quality Indicators (QI) SAS Software Runs in Windows, v2022

Prepared for:

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Overview

This document demonstrates how to schedule automated Agency for Healthcare Research and Quality (AHRQ) Quality Indicator (QI) SAS® Software runs on a Windows® computer. The examples contained in this document use the Patient Safety Indicators (PSI) module; however, these instructions can be applied to any module or combinations of multiple modules. Automating SAS runs in Windows is a straightforward process that allows users convenience and flexibility.

There are two options for automating software runs: (1) a five-step process to schedule a single SAS run via the Windows Task Scheduler, and (2) a five-step process to schedule a multiple sequential SAS runs using a batch process. This document contains basic written instructions followed by a screen shot for each approach. Note, steps 1 and 2 are identical for both options.

Option 1: Scheduling Automated Runs using the Task Scheduler

The five steps for manually scheduling automation for a single module at a time are described below:

1. Create a new task in the Task Scheduler

2. Choose the time and date the new task will run

3. Specify the exact Windows path to run SAS

4. Include additional Windows command parameters for saving SAS logs and output

5. Test Task Scheduler

1. Create a New Task in the Task Scheduler

Windows Task Scheduler is a utility that comes with Windows 10 and is integral for automating processes. Open the Task Scheduler by selecting the Windows icon in the lower left corner of the screen, typing "Task Scheduler", and selecting the Task Scheduler App in the search results (Figure 1).

Figure 1. Windows Task Scheduler
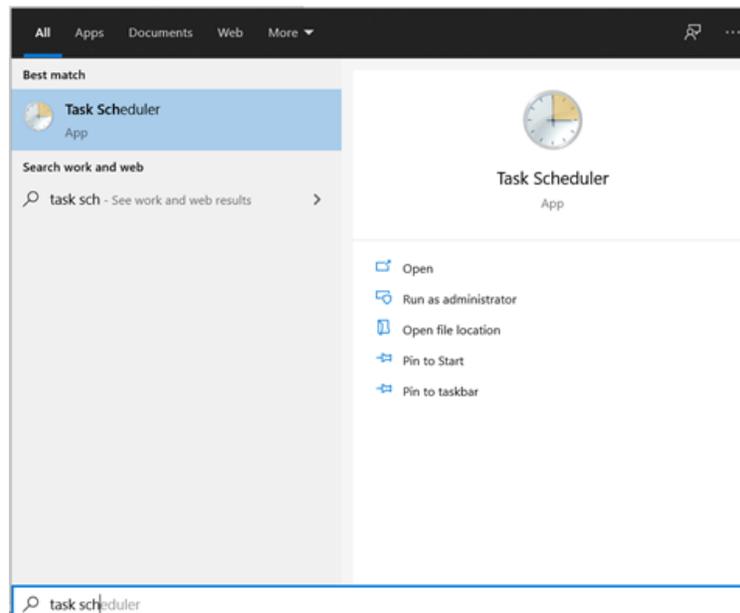
Once the Task Scheduler is open, select "Action" from the top menu and then select "Create Task…" from the drop-down options. This will open the "Create Task" window (Figure 2).

Figure 2. Create Task Window
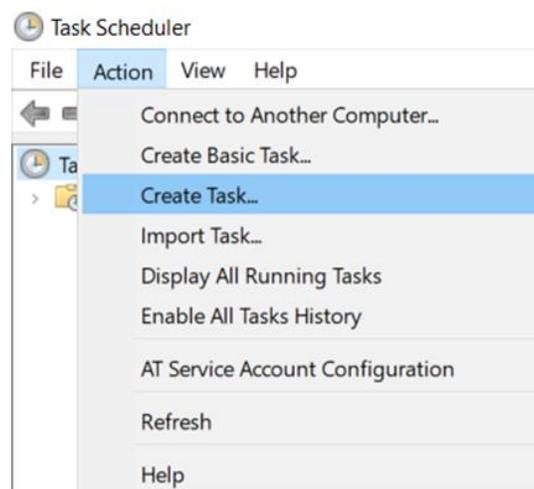
From the Create Task window, select the "General" tab and provide a task name and description in the **Name** and **Description** fields (Figure 3). In this example, to automate the PSI software run, the task is named "Run PSI v2022" and the description is "Run the PSI Control Program v2022 every Friday at 12:15 PM". This tab also provides the option to run the task when not logged on to a user account, as well as with the highest permissions. Do not click "OK" at this step. Instead, stay in the "Create Task" window to continue to Step 2.

Figure 3. General Tab in the Create Task Window
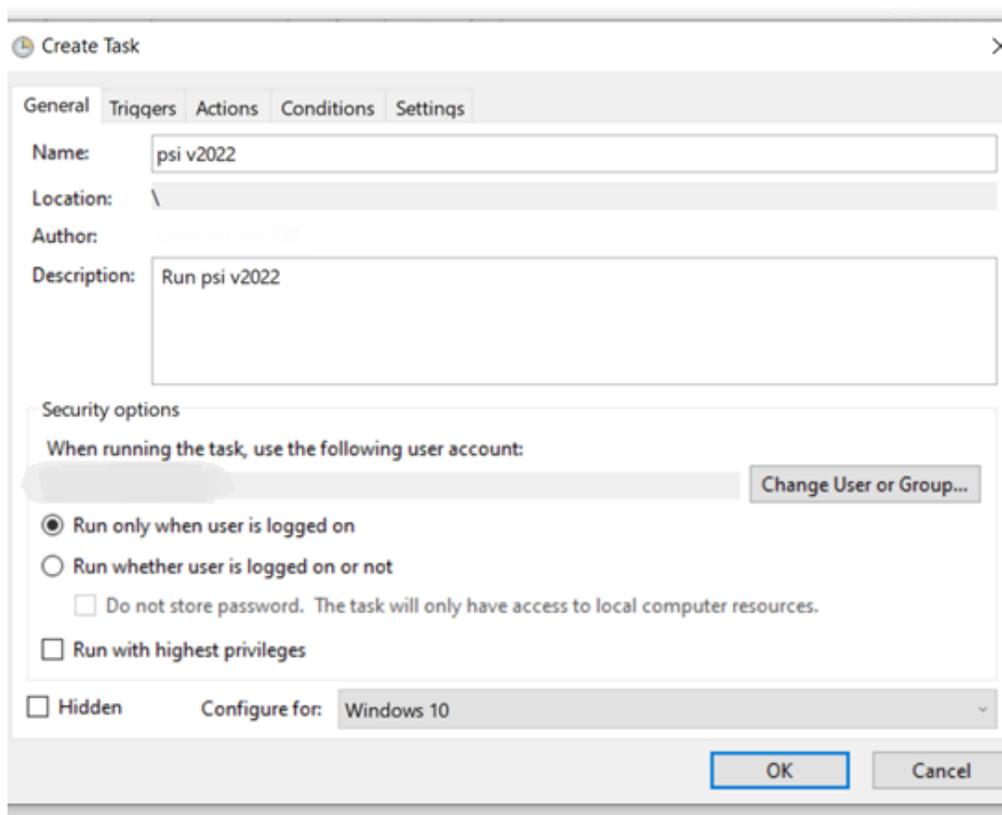
2. Choose the time and date the new task will run

Select the "Triggers" tab. The "Triggers" tab collects the time and day the process will run, as well as the recurrence schedule. To run the task on a schedule, choose "On a Schedule" from the Begin the Task drop-down menu (Figure 4). Other options can be selected for scheduling from this drop-down.

In this example, the PSI software is now scheduled to run every Friday at 12:15 PM. Click "OK" to exit the "Triggers" tab and go back to the "Create Task" main menu.

Figure 4. Triggers Tab in the Create Task Window
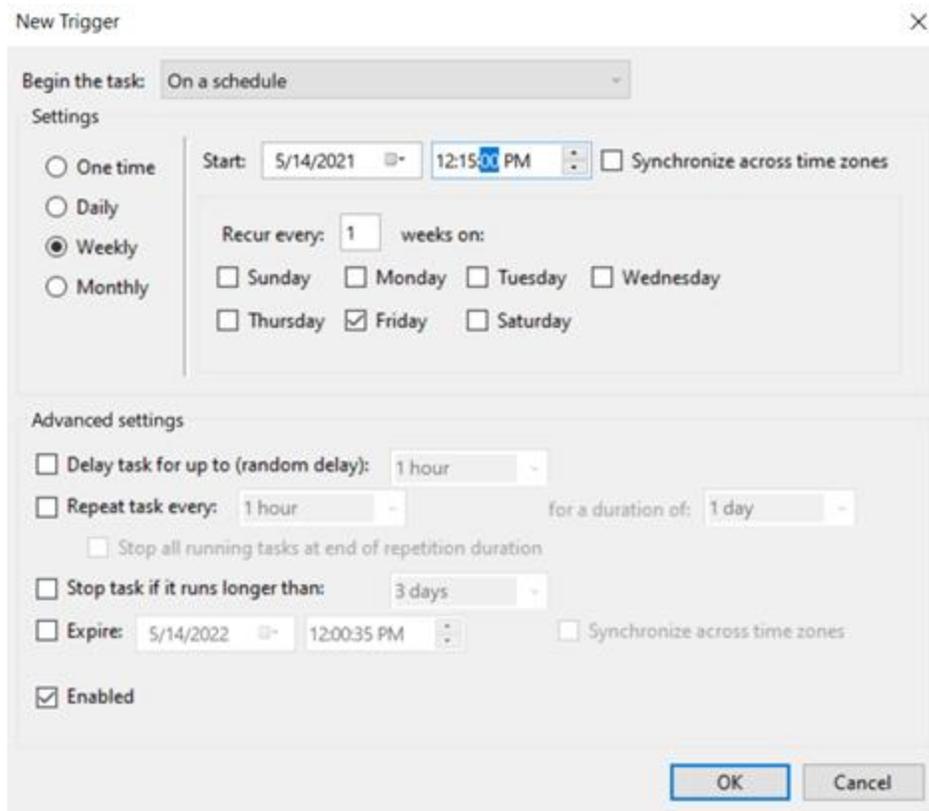
3. Specify the exact Windows path to run SAS

Once back at the "Create Task" main menu, select the "Actions" tab. Select the **New…** button ([Figure 5](#)).

Figure 5. Actions Tab in the Create Task Window
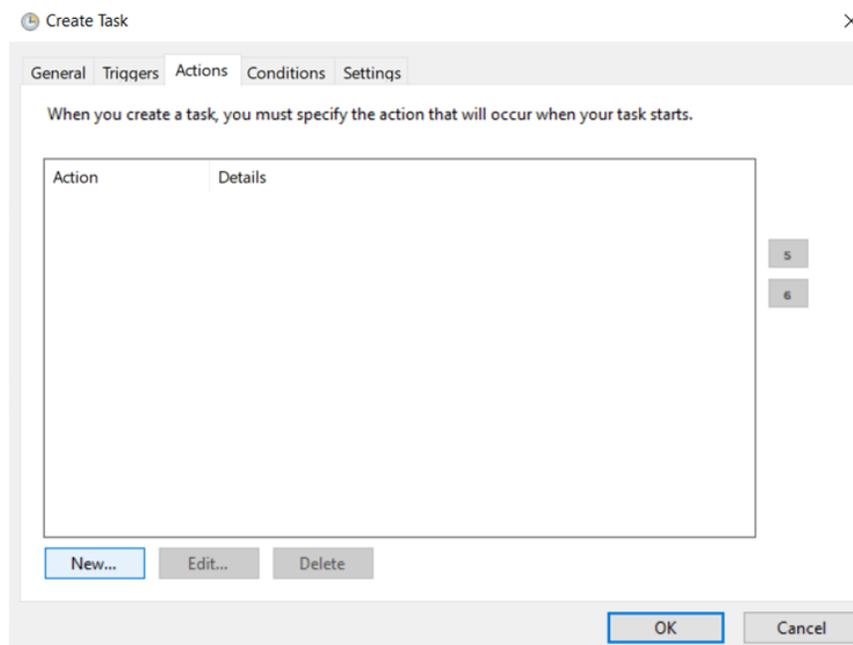
This will bring up the "New Action" dialog box. This box will specify how to run SAS, what program to run, and what output options to choose.

First, select **Start a Program** from the drop-down menu. Next, in the Program/Script box, navigate to where the SAS.exe file can be found on your computer ([Figure 6](#)). An example location would be: C:\Program Files\SASHome\SASFoundation\9.4\SAS.exe.

Figure 6. Specifying the Program in the New Action Dialog Box
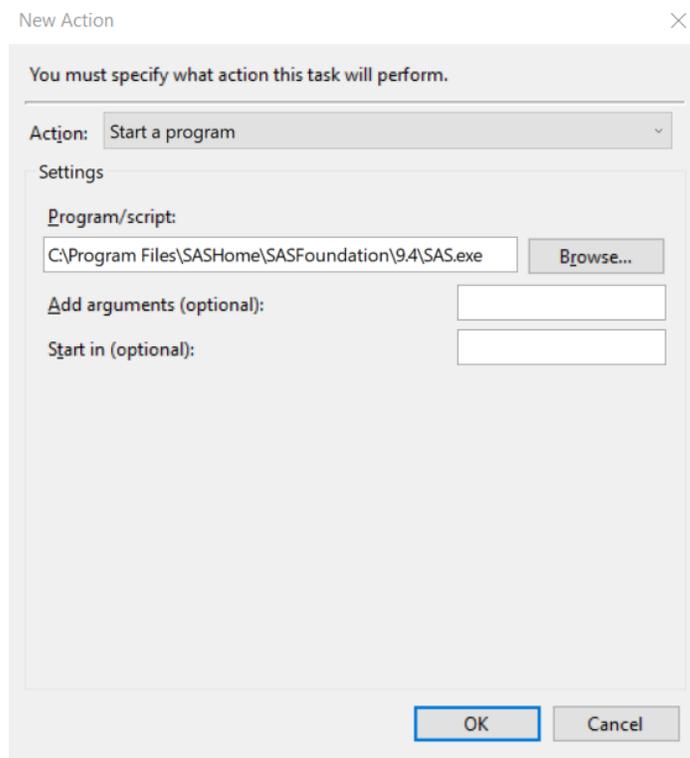
4. Include additional Windows command parameters for saving SAS logs and output

Next, additional arguments need to be specified. These arguments indicate which program to run in SAS, as well as what output files to create. In the "Add arguments" box:

1. Specify in quotes the full path of the QI control program to run.

2. To create a log, add the -log option to the text above in Step 4.1 and specify the full path in quotes to a log file to be created.

3. To create a listing file, add the -print option to the text above in Step 4.1 and specify the full path in quotes of the listing file to be created.

4. Select "OK".

The example below demonstrates the text arguments needed to run the PSI_HOSP_CONTROL.sas program and create a log and listing file ([Figure 7](#)).

"C:\Users**yourusename**\Desktop\QI\PSI\Programs\PSI_HOSP_CONTROL.sas" -log "C:\Users\ **yourusename**\Desktop\QI\PSI\Programs\PSI_HOSP_CONTROL.log" -print "C:\Users\ **yourusename**\Desktop\QI \PSI\Programs\PSI_HOSP_CONTROL.lst"

Figure 7. Adding Arguments in the New Action Dialog Box
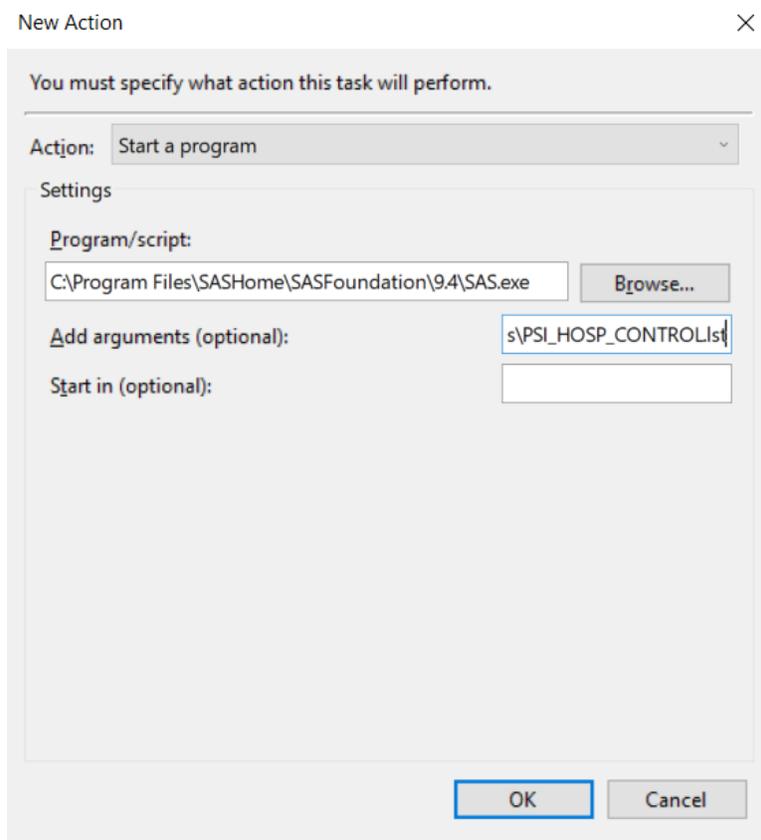
Now that the task is set up, select "OK" again from the "Create Task" window and the task will be ready to run as scheduled on Fridays at 12:15 PM.

5. Test Task Scheduler

Test the task scheduling by double clicking the scheduled "Run PSI v2022" task from the "Active Tasks" menu in Task Scheduler and selecting "Run" from the "Action" menu on the right side of the window. This will immediately run the specified program in the "Add arguments" dialog box and will create log and list files, if specified. Check the location to verify that a log file was created. If the log file is not present in location specified in the "Add arguments" box, ensure the specified paths have quotations and otherwise reflect the intended location.

Option 2: Scheduling Automated Runs using a Batch Option

Batch files are executable text files that list out multiple commands and parameters, and can be used to run multiple programs in sequence. When running the SAS QI software, a batch file can be used to run the programs from multiple modules in sequence. This option requires four steps; the first two steps are identical to those needed to manually schedule an automated run. The instructions are repeated below for ease of use. To use the batch scheduling option, the five steps include:

1. Create a new task in the Task Scheduler

2. Choose the time and date the new task will run

3. Create a batch file

4. Specify the exact batch file Windows path to run SAS

5. Test Task Scheduler

1. Create a New Task in the Task Scheduler

Windows Task Scheduler is a utility that comes with Windows 10 and is integral for automating processes. Open the Task Scheduler by selecting the Windows icon in the lower left corner of the screen, typing "Task Scheduler", and selecting the Task Scheduler App in the search results (Figure 8).

Figure 8. Windows Task Scheduler
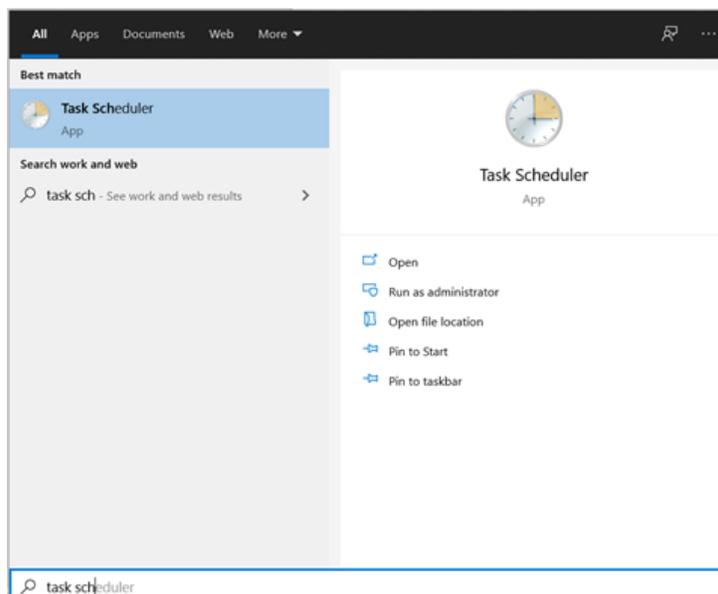
Once the Task Scheduler is open, select "Action" from the top menu and then select "Create Task…" from the drop-down options. This will open the "Create Task" window (Figure 9).

Figure 9. Create Task Window
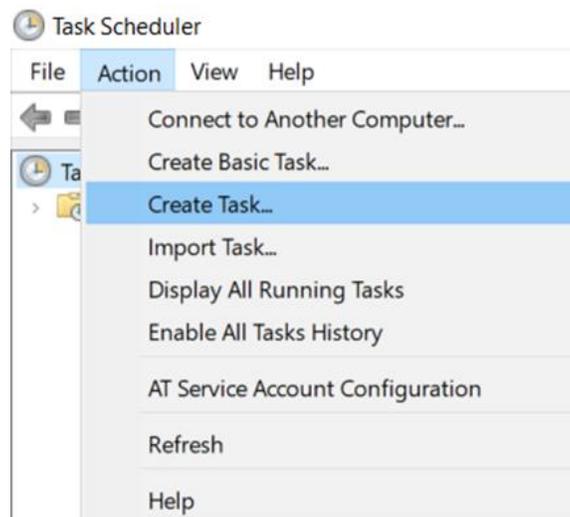
From the Create Task window, select the "General" tab and provide a task name and description in the **Name** and **Description** fields (Figure 10). In this example, to automate the PQI and PSI software runs, the task is named "Run PQI and PSI v2022" and the description is "Run the PQI and PSI Control Programs v2022 every Friday at 12:15 PM". This tab also provides the option to run the task when not logged on to a user account, as well as with the highest permissions. Do not click "OK" at this step. Instead, stay in the "Create Task" window to continue to Step 2.

Figure 10. General Tab in the Create Task Window
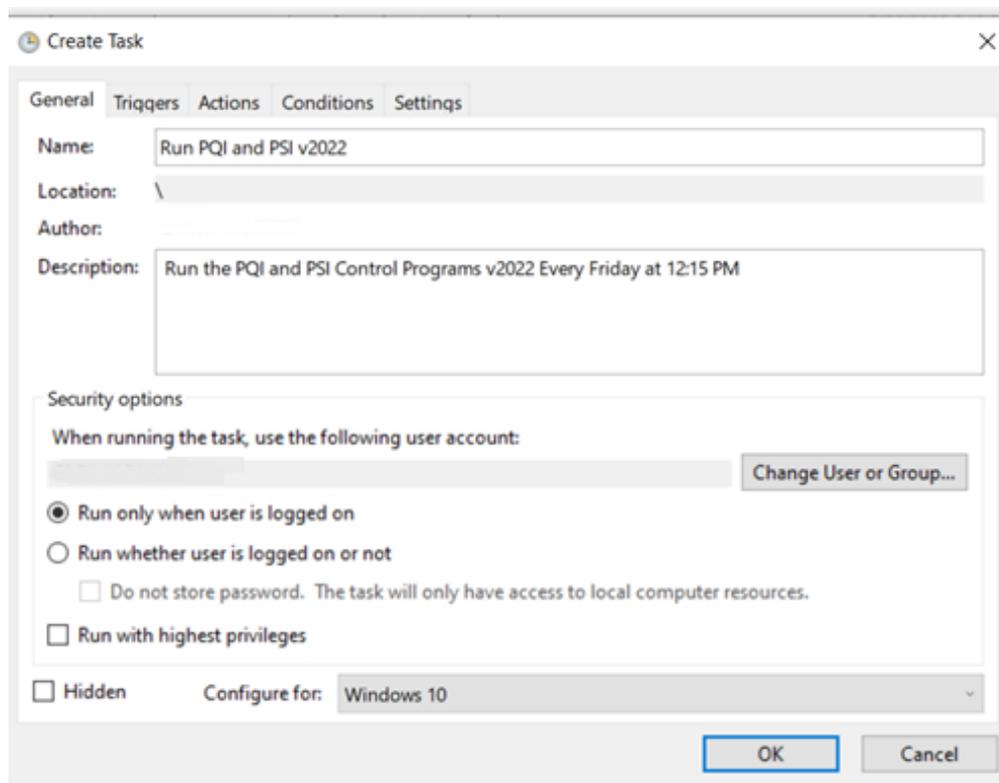
2. Choose the time and date the new task will run

Select the "Triggers" tab. The "Triggers" tab collects the time and day the process will run, as well as the recurrence schedule. To run the task on a schedule, choose "On a Schedule" from the Begin the Task drop-down menu (Figure 11). Other options can be selected for scheduling from this drop-down.

In this example, the PQI and PSI software are scheduled to run every Friday at 12:15 PM. Click "OK" to exit the "Triggers" tab and go back to the "Create Task" main menu.

Figure 11. Triggers Tab in the Create Task Window

3. Create the batch file

Batch files end in the .BAT suffix. Create a batch file in an editor and then add commands. The first command should invoke SAS, the second command should specify what program to run in SAS, and finally any additional commands should indicate any output files.

An example of a batch file that runs PQI and PSI in sequence includes these two sequences of commands in a file called "Run_PQI_PSI.bat." The paths need to be valid paths in your environment:

> "C:\Program Files\SASHome\ SASFoundation\9.4\sas.exe." "C:\Users\
> **YourUserName**\Desktop\QI \PQI\Programs\PQI_AREA_CONTROL.sas" -log "C:\Users\
> **YourUserName**\Desktop\QI\PQI\Programs\PQI_AREA_CONTROL.log"

> "C:\Program Files\SASHome\ SASFoundation\9.4\sas.exe." "C:\Users\
> **YourUserName**\Desktop\QI\ PSI\Programs\PSI_HOSP_CONTROL.sas" -log "C:\Users\
> **YourUserName**\Desktop\QI\PSI\Programs\ PSI_HOSP_CONTROL.log"

4. Specify the exact batch file Windows path to run SAS

Once back at the "Create Task" main menu, select the "Actions" tab. Select the **New…** button (Figure 12).

Figure 12. Actions Tab in the Create Task Window
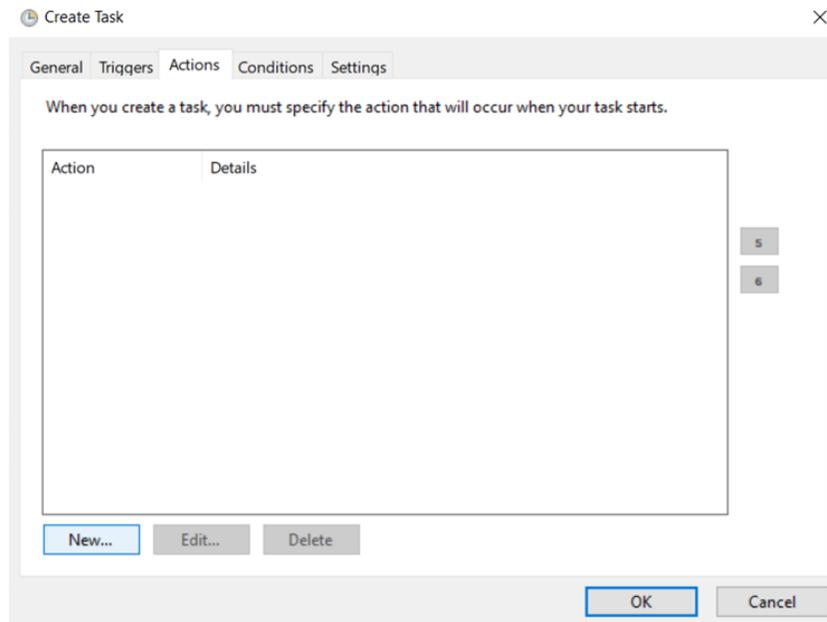
This will bring up the "New Action" dialog box (Figure 13). This box will specify the batch file to call. Batch files end in the .BAT suffix. This technique runs the batch file like an executable file.

The example below demonstrates how "Run_PQI_PSI.bat" would be called in Task Scheduler.

Figure 13. Specifying the Batch File in the Task Scheduler
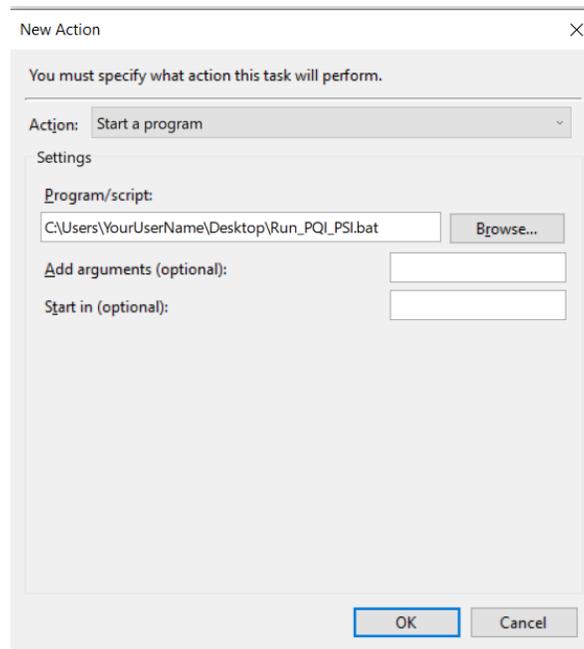
5. Test Task Scheduler

Test the task scheduling by double clicking the scheduled "Run PSI v2022" task from the "Active Tasks" menu in Task Scheduler and selecting "Run" from the "Action" menu on the right side of the window. This will immediately run the specified program in the "Add arguments" dialog box and will create log and list files, if specified. Check the location to verify that a log file was created. If the log file is not present in location specified in the "Add arguments" box, ensure the specified paths have quotations and otherwise reflect the intended location.

Summary and More Information

This concludes how to set up the QI software to run automatically using the Task Scheduler in a Windows environment. Users can create more than one task to schedule a single module to run at different points in time using Option 1. Alternatively, users can create batch files to schedule multiple modules to run in sequence using Option 2.

For more information on Windows Task Scheduler, please see this link: https://docs.microsoft.com/en-us/windows/win32/taskschd/about-the-task-scheduler

For more information on SAS Batch Commands in Windows see this link:

https://www.pharmasug.org/proceedings/2013/CC/PharmaSUG-2013-CC18.pdf