```powershell
1  #PowerShell Runspace Testing
2  #Written by: Jeff Brusoe
3  #Last Updated: APril 14, 2021
4  #
5  #Based on: https://www.youtube.com/watch?v=kvSbb6g0tMA
6
7  Set-StrictMode -Version Latest
8  Clear-Host
9
10 $StopWatch = New-Object System.Diagnostics.Stopwatch
11
12 Write-Output "Generating Delay Array..."
13 $MillisecondArray = Get-Random -Count 50 -Minimum 100 -Maximum 500
14
15 Write-Output "`n`nBeginning to Process Delays Sequentially"
16
17 $StopWatch.Start()
18 $Process = 1
19 foreach ($Millisecond in $MillisecondArray)
20 {
21     Write-Output "Process $Process Milliseconds: $Millisecond"
22     $Process++
23
24     Start-Sleep -Milliseconds $Millisecond
25
26     $ElapsedTime = $StopWatch.Elapsed
27     Write-Output "Elapsed Time: $ElapsedTime"
28
29     Write-Output "*************************"
30 }
31
32 $SequentialElapsedTime = $StopWatch.Elapsed
33
34 Write-Output "`n`nNow Trying with Runspaces"
35 $MinRunspaces = 1
36 $MaxRunspaces = 5
37 $RunspacePool = [RunspaceFactory]::CreateRunspacePool($MinRunspaces,$MaxRunspaces)
38 $RunspacePool.ApartmentState = "MTA"
39 $RunspacePool.Open()
40
41 $CodeContainer = {
42     param (
43         [int]$Milliseconds
44     )
45
46     Start-Sleep -Milliseconds $Milliseconds
47     return $Milliseconds
48
49 }
50
51 $Threads = @()
52 $StopWatch.Restart()
53 foreach ($Millisecond in $MillisecondArray)
54 {
55     $RunspaceObject = [PSCustomObject]@{
56         Runspace = [PowerShell]::Create()
57         Invoker = $null
58     }
59
60     $RunspaceObject.Runspace.RunspacePool = $RunspacePool
```

```powershell
61        $RunspaceObject.Runspace.Addscript($CodeContainer) | Out-Null
62        $RunspaceObject.Runspace.AddParameter("Milliseconds",$Millisecond) | Out-Null
63        $RunspaceObject.Invoker = $RunspaceObject.Runspace.BeginInvoke()
64
65        $Threads += $RunspaceObject
66
67        $ElapsedTime = $StopWatch.Elapsed
68        Write-Output "Elapsed Time: $ElapsedTime"
69        Write-Output "*************************"
70 }
71
72 $ElapsedTime = $StopWatch.Elapsed
73 Write-Output "Time to Create All Runspaces: $ElapsedTime"
74
75 while ($Threads.Invoker.IsCompleted -contains $false) {
76        Write-Verbose "Waiting for all threads to complete"
77 }
78
79 $RunspaceElapsedTime = $StopWatch.Elapsed
80
81 $ThreadResults = @()
82 foreach ($Thread in $Threads)
83 {
84        $ThreadResults += $Thread.Runspace.EndInvoke($Thread.Invoker)
85        $Thread.Runspace.Dispose()
86 }
87
88 $RunspacePool.Close()
89 $RunspacePool.Dispose()
90
91 Write-Output "`n`nTrying with -Parallel of ForEach-Object"
92 $StopWatch.Restart()
93 $MillisecondArray | ForEach-Object -Parallel {
94        Start-Sleep -Milliseconds $_
95
96        Write-Output "In Parallel Script Block"
97        Write-Output "**********************"
98 }
99
100 $ParallelElapsedTime = $StopWatch.Elapsed
101
102 Write-Output "`n`n"
103 Write-Output "Time Summary:`n"
104 Write-Output "Sequential Elapsed Time: $SequentialElapsedTime"
105 Write-Output "Runspace Elapsed Time: $RunspaceElapsedTime"
106 Write-Output "Parallel Elapsed Time: $ParallelElapsedTime"
```