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|  | 420-623 Windows Networking |  | Worth 7% |
| Winter 2017 |  |  |

Assignment #4: Understanding RAID

**PowerShell script**:

1. Translate the complete text for Shakespeare’s MacBeth (provided in the assignment zip file) to ASCII codes (represented in binary). The result will be a bitstring of approximately 800,000 bits in length
2. Create and populate three files designed to mimic a RAID5 array:
   1. A stripe1 file that will contain bit #1, bit #3, parity #3, etc.
   2. A Stripe2 file that will contain bit #2, parity #2, bit #5, etc.
   3. A Stripe3 file that will contain parity #1, bit #4, bit #6, etc.
3. Simulate a catastrophic disk failure: Delete a random disk (get-Random). Rebuild the RAID array using the two remaining disks.
4. Using the rebuilt array, convert the contents back to text and store the result into a new file.

**Grading:**

* 100%: Does the rebuilt stripe file match the original using the WinMerge application as the judge. There is no room for interpretation, WinMerge must report that the two files as exactly identical or the grade is 0.
* Bonus (50%): Be in the top 10% of the entire class in terms of total runtime (as measured with Measure-Command)

**NOTES:**

* Your script must run to completion in under 10 minutes (you are doing something VERY wrong if this is a hard requirement to meet).
* Your script should read line-by-line using an iterator of some sort, do not simply read everything into memory
* Your script should write line-by-line using an iterator of some sort, do not simply keep everything in memory and do one write at the end.
* If you are using Windows 7, upgrade to PowerShell v4.0 – it will save you HOURS of frustration: <http://social.technet.microsoft.com/wiki/contents/articles/21016.how-to-install-windows-powershell-4-0.aspx>. Use the $PSVersionTable system variable to check your installed version.

**Submission:**

A zip file containing:

* Your script (with appropriate comments)
* Your three original RAID5 files plus the rebuilt file
* The re-generated copy of the input file. Note that this MUST match the original distributed with the assignment – double-check before submitting!

**Helpful Hints/Resources:**

* WinMerge: <http://winmerge.org/>
* ASCII table: <https://simple.wikipedia.org/wiki/ASCII>
* Reference: Working with hash tables: <https://technet.microsoft.com/en-us/library/ee692803.aspx>
* Using System::IO::File to do streaming read/write: <http://stackoverflow.com/questions/4192072/how-to-process-a-file-in-powershell-line-by-line-as-a-stream>
* Array slicing: <http://softwaresalariman.blogspot.ca/2007/12/slicing-powershell-arrays-and-ranges.html>
* Converting decimals to chars (and back): <http://powershell.com/cs/blogs/tips/archive/2009/03/06/converting-ascii-and-characters.aspx>