**Linux Shell Scripting: A project-based approach to learning**

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01:00

FIFTH SCRIPT

1. Generate Random Data for password
2. Cryptographic Hash Functions
3. Text and String Manipulation

* **Random Numbers:**
* RANDOM is a shell built in variable. Range of 0 and 32767
* !v - this will execute the most recent command executed that started with a 'v'. This is called an event designator. For instance, if in the history of executed command the most command which starting with v was "vim luser-demo05.sh" then, when we type !v. it will automatically open the luser-demo05.sh in vim editor for editing.
* Date +%s - seconds since 1970-01-01 00:00:00 UTC. This is also called epoch or unix or epic or posix time.
* Date +%N - nanoseconds
* PASSWORD=$(date +%s%N) - will generate epoch time+ nanoseconds password
* **Hash Function:**
* Checksum: is a numeric value that is generated for a block of data that is relatively unique. Used to check the integrity of the file using file comparisons.
* Built-in function in centos: shasum1 filename, sha256sum filename
* These checksum functions are stored in /usr/bin/\*sum which you can view using the command: ls -l /usr/bin/\*sum
* Tip!
  + If on entering type -a COMMAND\_NAME, we find the command is not the shell built-in but rather a program for eg, /usr/bin/ then we will use help command to get more information on the mentioned command name. Otherwise, if it is a shell built-in command then, we will use the man command to gather more information on the mentioned COMMAND\_NAME.
* Head: it is a program that reads first K bytes or lines from a given file (from the top)
  + Eg: head -n6 filename or head -6 filename
* Tail: it is a program that read last K bytes or lines from a given file (from the bottom)
  + Eg: tail -n7 filename or tail -7 filename
* Special characters optimization: we can store a complete list of special characters in a variable and perform operations on it. For instance,
  + SPECIAL\_CHARACTERS="~!@#$%^&\*()\_+`{}|:"<>?[]\;',./"
* Operations which can be performed on variable: SPECIAL\_CHARACTERS
  + Fold: this is analogous to a piece of paper where a sentence is written and at even letter the paper is folded. Towards the end, we are left with multiple folds where each folded block represents a single character belonging to that sentence
  + Shuf: this generate random output from a given list of sample space. So, if a sentence is shuffed, it will generated random letters form the entire sentence.
* Usafe of shuf and fold on SPECIAL\_CHARACTER:
  + SPECIAL\_CHARACTERS=$(echo "~!@#$%^&\*()\_+`{}|:"<>?[]\;',./")
  + Echo "${?}" | fold -w1 | shuf | head -c1 -> given a random special character
  + Using pipes in commands is called as DATA MUNGING or STRING MANIPULATION
  + Tip!
    - Refer Command Line Kung-fu book