Advanced Linux System Administration: Lab Exam (Topics 1-5)	

Prior Instructions:
In the following link you will find a file named ExamenParcial.zip. Download it to a local folder, uncompress the file and add the machine to Virtualbox.
        http://www.ce.unican.es/OCW/SI/Eval/2016-17/ExamenParcial1.zip

Each Exercise has its own snapshot as a starting point, named Ej<X>Begin. After booting the machine, log in as root user: login=root / password=root. **After finishing each exercise, <u>power off the virtual machine</u> and create a snapshot labeled Ej<X>Result (replace <X> with the exercise number).**

Exercise 1 (2.5p). Power on the machine from snapshot Ej1Begin. Create the following scripts (in /root directory):

1. Largest.sh: its input argument is a text file (números.txt) containing a number per line. The script returns the largest number. If the file does not exist or no name is passed as argument, the script generates a text message in the terminal informing about the problem.

2. Phone.sh: the script requests a surname interactively (Not an argument) and returns the phone number of those users matching the surname. The user list is in the file agenda.txt. Once the users are printed, a new surname is requested. The script ends when the surname found is the string "end".

3. Making use of a single command line, create a command able to count lines from the file ejercicio.txt for each described text pattern. Write down the commands created in a script named Solution.sh. These are the patterns to be found:
    a. Count the number of empty lines.
    b. Count the number of lines only containing the word "return".
    c. Count the number of lines containing at least one digit.
    d. Count the number of lines starting with the string "void".

Exercise 2 (3p) Power on the machine from snapshot Ej2Begin. Carry out the following tasks:

1. Create the script clean_tmp.sh, able to remove from /tmp folder only those files belonging to user root and that have not been modified during the last month. You can check out your script in the folder /tmp-examen.

2. Search, among SysV services, which one is in charge of cleaning /tmp directory during booting process, and perform the required actions to avoid this removal.

3. Create a new service for /tmp removal, making use of the script create in the first section. The new service will have the following properties: it will only be used for runlevels 3,4 and must be the last one to start. When the machine is powered off, the service will be the first one to stop, simply printing out the following message: ("Killing Service Tmp Clean").

Exercise 3 (2.5p). Power on the machine from snapshot Ej3begin. Configure systemd as your default booting system. After this task, you must analyze booting performance for two different targets: multi-user.target and rescue.target. Save the result files in the directory /root and find out which target boots faster. Write your answer in the following text file: /root/Exercise3.txt.

Exercise 4 (2p). Power on the machine from snapshot Ej4begin. One of the users of this machine needs to use the Redis database software (https://redis.io) to work. Download the source code appropriate for your machine (stable version), compile and install the generated binaries to make Redis available to every user.

Once you have finished the exam, copy the following files to the device provided by the teacher:
> **-ExamenParcial.vbox**
> **-Snapshots (whole folder)**