Sistemas Informáticos (Computer Systems)

Third term assessable activity

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Updated January 2023

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> ! **Attention:** read the whole activity before beginning.

1. Introduction

Your client ***BiCiBiKeR S.L.*** *again is* very pleased with your job. Instead of hiring you for punctual tasks, they want to hire you as a part of the staff, with a profile of "DevOps".

They know your skills, but they want to perform two tasks in order to know if you are valid DevOps or not. In order to this, you have two tasks: one about networking (asking several questions) and other creating a portfolio on GitHub.

> ! **Attention:** with this assessable activity is included a Cheat Sheet of how to use Git (tool) and GitHub (service). But if you have problems, feel free to ask how to use it to your teacher. Our main goal is to introduce you a practical tool present in most of the companies.

2. Topic 01: Networking

Question 01: Discuss and justify what is the better hardware to interconnect three computers: a hub, a switch or a router.

Question 02: Explain what is the best network configuration, supposing in the network Secretary in the future we want to connect 50 computers and in network Human resources in the future we want to connect 64 computers.

Question 03: Explain with a video in a Linux system how to create and share with Samba a folder called "*/sharedsamba*" and show how you configure a remote Linux system to access to "*/sharedsamba*" and auto mount it.

3. Topic 02: Programming

Create those scripts and upload them to a private repository in GitHub, giving permissions to user "sergarb1" (my user) in order to create a Python portfolio.

Program 01

Create a Python 3 script for Linux that checks every minute if a Docker machine previously launched is down and notify it using Telegram to a Telegram user.

Program 02

Create a Python 3 program to help to organize files in current folder. This program will have a list with several extensions (if that list is modified, the program should work too).

For example, with ***list=["png", "mp4", "doc"]***, the program should create folders "png", "mp4", and "doc" and move all files with that extension inside those folders.

Program 03

Using the library https://pypi.org/project/python-barcode/, you have to read a ".csv" file, provided as an argument from console.

That file has a format "name,ID"

For example:

"Alumne 01","1"

"Alumne 02","2"

You have to create a program that read that ".csv" file and for each line generates a file called as "name_readed.png" with a barcode in format "EAN 13" which information contains the read ID from that line

💬 **Tip 01:** to read ".csv" files, you can use library "csv" or library "pandas". Some examples:

https://code.tutsplus.com/es/tutorials/how-to-read-and-write-csv-files-in-python--cms-29907

https://pythonbros.com/leer-csv-con-pandas/

💬 **Tip 02:** you can install Python Barcode with these commands: ***'pip3 install python-barcode'*** and ***'pip3 install "python-barcode[images]"'***.

💬 **Tip 03:** you can check examples of how Python Barcode works in https://pypi.org/project/python-barcode/. Before start coding, you should understand EAN 13 format https://es.wikipedia.org/wiki/European_Article_Number

Program 04

Following last questions and using as base this code https://www.geeksforgeeks.org/how-to-make-a-barcode-reader-in-python/ do a program that reads ".png" from a directory and the program have to say its name (from "png" name) and extracts ID from the Barcode.

💬 **Tip 01:** for using this library you have to install "***pip3 install pyzbar***", and the Linux tool "zbar" with this command "***apt install zbar-tools***"

💬 **Tip 02:** in order to use library "cv2" (Computer Vision), you have to install "***pip3 install opencv-python***" and "***pip3 install opencv-contrib-python***".

4. DELIVERY

This assessable activity has to be written in English by yourself. You are not allowed to use translation tools and its use will be punished as it was a copy.

> ! **Attention:** You can send the task until 22th May 2023 at 23:55.

You have to deliver:

- A document including:
  - Answer to networking questions.
  - Link to your GitHub repository (shared with "sergarb1" user).
- A video answering Samba questions.

5. ASSESSMENT

The activity is individual and non-transferable. To consider it completed, it is not enough just to deliver the dossier. The student must be able to defend his/her exercise at the request of the teacher and be able to make small modifications related to it, in order to demonstrate the acquisition of knowledge and avoid any suspicion of copying.

> ! **Attention:** The copy is punished with the fail of the complete module.