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Exercises in SSDS

Exercise 2

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Operating Systems (OS) Introduction and OS Structures

1) The Linux directory structure is like a tree containing all the methods and data structures that an OS uses. It is accessible via the command "/" or via user interface (open a file manager on your Linux box and select Computer in the sidebar to show your system folders). This structure is the starting point for the file system hierarchy, being responsible for many services (*e.g.,* I/O operations, resource allocation, file systems, and others). Complete the table below providing the description of these common *top level directories*.

Folder	Description
/bin	
/boot	
/dev	
/etc	
/lib	
/sys	
/proc	
/tmp	
/mnt	
/home	

2) About the */proc* directory on Linux. Tick which file contains information about direct memory access channels.

	Alternative
	/proc/cpuinfo
	/proc/dma
	/proc/ioports

	Alternative
	/proc/help
	/proc/modules

3) The Linux directory is organized into separate folders containing the top level directories. Based on the directories below:

/bin - host configuration and startup files
/boot - Static kernel and files needed to load the kernel
/dev - device inputs for terminals, disks, modems, etc.
/etc - essential commands required for minimal system operation

Tick the option that contains those that have the content exchanged.

	/bin and /etc
	/dev and /etc
	/bin and /boot
	/dev and /boot
	All options are correct

4) Among the various functions of the **kernel** and its architectures, mark as True (T) or False (F) regarding the following sentences:

	The kernel is the basis on which other parts of the operating system, device drives, and programs run.
	A micro kernel is not modular and difficult to port into new architectures
	An operating system is considered monolithic when your kernel runs as multiple programs.
	Monolithic kernels moves as much as possible from the “kernel space” into “user” space
	Keep control of the files on disk; initialize and run programs concurrently; and allocate memory.

5) The BIOS, CMOS and EPROM of a computing system correspond, respectively, to:

	Software, software and hardware.
	Software, hardware and hardware.
	Hardware, hardware and software.
	Software, hardware and software.
	Hardware, software and hardware.

6) Tick the option which is NOT function of the Kernel in an operating system.

	Accouting for system usage
	Support for local and distributed networks
	Filesystem management
	Provide command line interface
	I/O management

7) The operating system is a program or set of programs whose function is to manage system resources, as well as provide an interface between the computer and the user. In this regard, mark the INCORRECT alternative:

	Process management is an operating system task.
	Memory management is an operating system task.
	The file system is defined and manipulated by the operating system.
	Reproduce text and images using a master form or template
	Managing the input and output devices is the task of the operating system.

8) The tendency of operating systems is to make the kernel smaller and simpler. The idea of providing the services of process management, file management, memory management, etc. processes in the user space, outside the core, is called:

	Macro kernel
	Monolithic kernel
	Nano kernel
	Micro kernel
	Hybrid kernel

9) The communication of an application with the input and output subsystem of an operating system is established by means of:

	Shell
	Device drivers
	System calls
	Scripting
	Batch

10) In operating systems, for an operation to execute a privileged instruction, the processor implements the access mode mechanism. This mechanism is basically divided into two access modes known as:

	System calls and protected mode
	Protected mode and cluster
	User mode and kernel mode
	Cluster and kernel mode
	Assynchronous mode and user mode

11) One of the most important components of an Operating System is the Kernel. Tick the alternative below corresponding to the major goal of this component.

	The Kernel represents the lowest abstraction level within the operating system, being responsible for briding user applications with the hardware based on its drivers.
	Responsible for bootstrapping the operating system, loading the core available services such as the scheduler and the file manager.
	The Kernel belongs to the set of Graphical User Interface tools, assisting users in the application management
	None of the alternatives above

12) Differently from physical machines, which relies on the user and kernel access modes, virtual machines only relies on the user mode as they can only be executed as an user application. Tick true or false.

	True
	False

13) The Linux operating system has a Monolith Kernel structure and a single user architecture, which increases its security. Tick true or false.

	True
	False