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| Module Title: | Operating Systems and Network |
| Module Code: | B8IT116 |
| Module Leader: | Kingsley Ibomo |
| Assessment Number (if relevant): | 1 |
| Individual/Group: | Individual |
| Assessment Weighting: | 50% |
| Planned Feedback/Results Release Date: | Within two weeks of submission |
| Mode of Submission: | On-line **ONLY Moodle** |

# SECTION 1

1. Install [VMware](https://www.vmware.com/content/vmware/vmware-published-sites/us/products/workstation-player/workstation-player-evaluation.html.html?PID=8900246&PubCID=3486349&cjevent=fe8fde00275111ec827800840a18050d)/[Virtualbox](https://www.virtualbox.org/wiki/Downloads) on your Machines. **(2 marks)**
2. Download and install latest VMDK image of Ubuntu distribution according to your system architecture (32bit or 64bit) from following [link](https://www.osboxes.org/vmware-images/) as guest operating system in VMware OR Download and Install [VDI](https://www.osboxes.org/virtualbox-images/) image if you are using VirtualBox **(5 marks)**
3. Discuss the different types of hypervisors (**6 marks)**
4. Using the ***netsh*** command block ICMP echo request from your host to the virtual machine **(4 marks)**
5. Provide evidence of remote access to the virtual machine using ***ssh.***

**(3 marks)**

# SECTION 2

This section requires you to have C/C++ compiler installed on your computer system. Refer to this [link](https://www.freecodecamp.org/news/how-to-install-c-and-cpp-compiler-on-windows/) on how to set it up.

1. Write a C program that performs the following tasks:

* Allocate an array of integers of size 10.
* Populate the array with the numbers 1 through 10.
* Print the starting address of the array.
* Prompt the user for an index (between 0 and 9).
* Display the memory content (value) at the array's address offset by the index provided by the user.
* Display the exact memory address of the user-specified index. (**14 marks)**

1. Write a C program to perform the following tasks:

* Create a file named data.txt.
* Write the string "Hello, Operating System!" into the file.
* Read the contents of the file and display it on the console.
* Close the file. (**6 marks)**

# SECTION 3

1. Write a shell script that executes every 10 minutes. The script should ping the IP address of a remote system and save the output in a file that gets automatically sent to your personal email as an attachment. This task can only be completed on a Linux host system. It requires you to investigate how to schedule a cron job. **(10 marks)**

Hint: Investigate installing mutt, kmail, sendmail etc. [link](https://www.digitalocean.com/community/tutorials/send-email-linux-command-line)

NOTE: You are required to provide image evidence of each of the answered questions in section 1.

# SUBMISSION:

A single document must be submitted to Moodle on/before the above stated deadline.

**Deliverables**

1. A document containing evidence of VMware/VirtualBox installed. It should contain answers to questions in SECTION A (allowed file format.doc.docx and pdf only)
2. The document should include copies of your codes for SECTION B
3. The final section should include instructions on how to schedule the script to execute at 10 minutes interval and a sample of the script command for SECTION C

All submissions will be electronically screened for evidence of academic misconduct (i.e., plagiarism and collusion)