Course Code	:	CST 306
Course Name	:	Principles of Operating Systems
Lecturer	:	Asst. Prof. Ts. Dr. TEH Jia Yew
Academic Session	:	2023/04
Assessment Title	:	Deploying Vanilla kernel
Submission Due Date	:	**2 May 2023 @ 11.59 pm**

Prepared by :

Group	
Student ID	Student Name

Date Received :

Feedback from Lecturer:	
	Mark:

Own Work Declaration

I/We hereby understand my/our work would be checked for plagiarism or other misconduct, and the softcopy would be saved for future comparison(s).

I/We hereby confirm that all the references or sources of citations have been correctly listed or presented and I/we clearly understand the serious consequence caused by any intentional or unintentional misconduct.

This work is not made on any work of other students (past or present), and it has not been submitted to any other courses or institutions before.

Signature:

Date:

Introduction

Vanilla kernel refers to Linux kernels which are not tied to any distributions. Integrating kernels provide ways to customize the operating system. The hands on guide to Linux kernel compilation can be found at:

https://www.cyberciti.biz/tips/compiling-linux-kernel-26.html

Other related web based sources and videos in Youtube can serve as you reference.

Note:

1. Take notice of all the tools required for kernel compilation.
2. An **average of 2 to 3 hrs** are required for **one** kernel compilation process to be completed. Allocate a minimum of 4GB RAM.
3. **Attempt this assignment over a Virtual Machine**, **not over your host system** since newly installed kernels may not boot and may corrupt existing Windows or host OS in real time environment.

Objective

To expose students to the Linux kernel compilation process and gain skills needed for kernel deployment.

Task

1. This is an ***individual submission***. Each student is required to upgrade the kernel of the Ubuntu 16.04 OS to the kernel versions as per indicated in Table 1 below. Kernel sources can be downloaded at:

   https://cdn.kernel.org/zpub/linux/kernel/v5.x/

   Assigned kernel versions can be found at:

   Apr2023_CST306_Assignment_kernel_assignment_list.xlsx

a. No two or more students shall compile identical kernel versions. Marks will be split between any students with the same kernel version.

b. This documents shall be provided in both pdf & Word versions. Both versions are identical. If there are any discrepancies, the pdf version shall prevail.

Deliverables

Submit A and B in one compressed file : *<student_ID>.zip* e.g. *CST1234567.zip*. Your submission MUST comprise BOTH sections A and B below:

A. Assignment Report Submission

The following needs to be included in your lab report:

1. Print all pages of this assignment question and submit together with the attached marking rubric into Moodle (under *Assignment 1 Submission*) by the due date mentioned on the first page.

2. **Screenshot** of your Terminal with these command outputs, 'date', 'uname –a' and 'dpkg --list | grep linux-image' to display the newly installed kernel. Paste your screenshot on the 'Output' section below.

3. **Screenshot** of your */boot* folder, with date and time stamp of files. Apply a red circle or rectangle around your kernel image file, in which you used to install the new kernel.

4. Submit **ONE hard and ONE softcopy (pdf & word) of the Assignment Report.**

5. No source code is required to be submitted since the kernel is a huge collection of 10k files with millions of lines of code (LOC).

B. Video Submission

Submit an approximately 5 min video clearly showing the following:

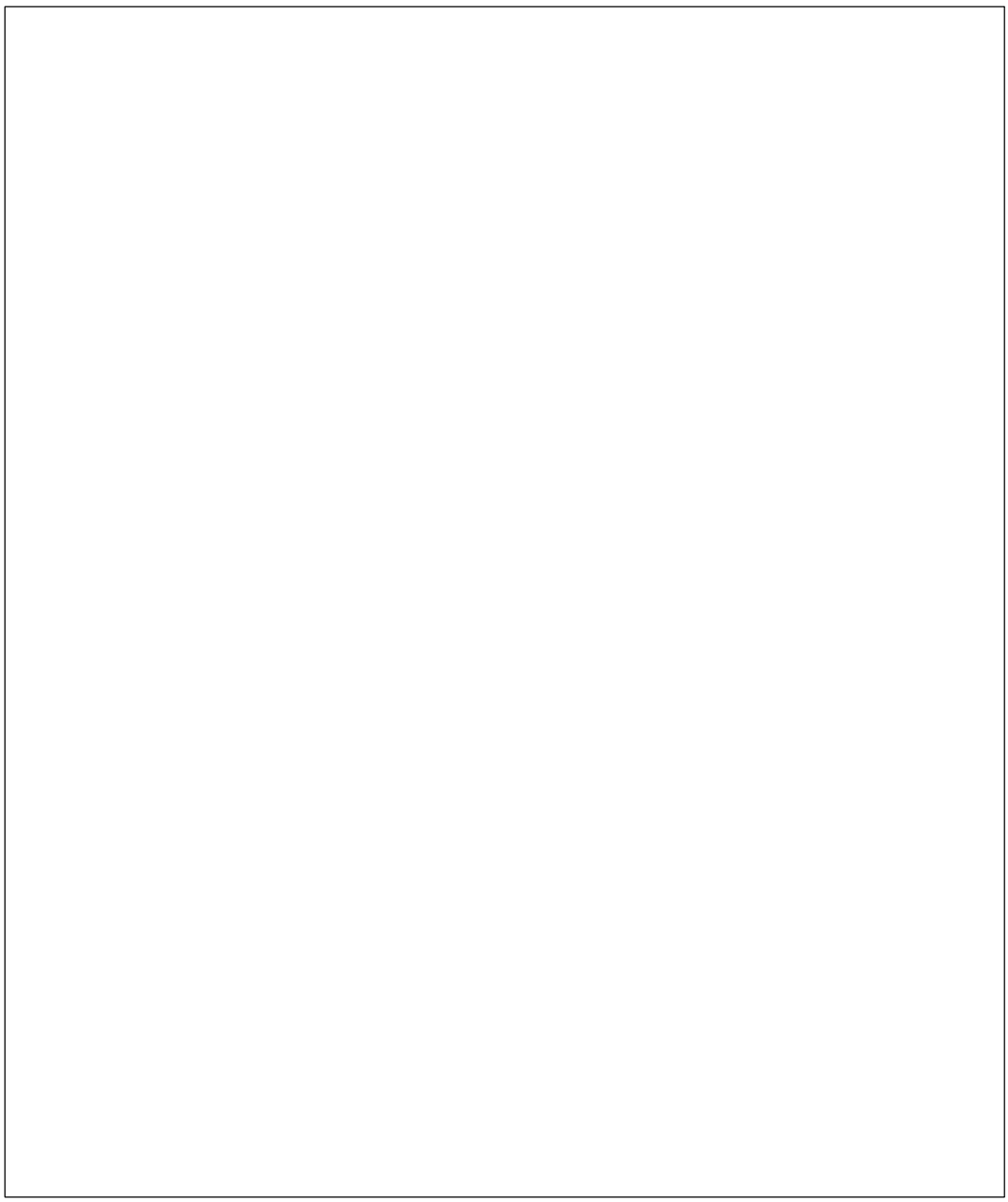
1. Boot process from starting your hypervisor till the system boots up.
2. Run Terminal and display your student ID via the *echo* command.
3. The output from executing the following commands:

   date', 'uname –a' and 'dpkg --list | grep linux-image

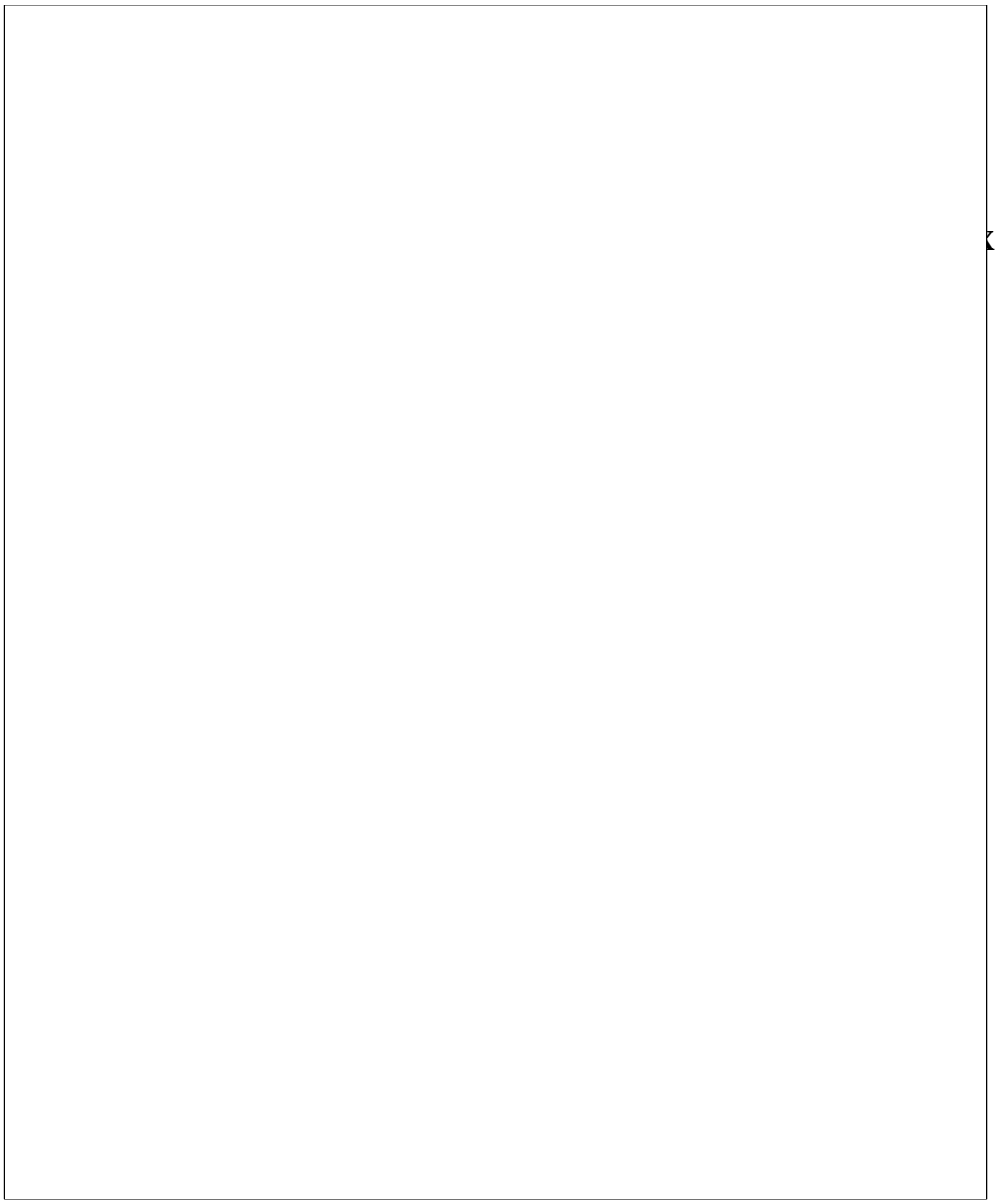
4. *ls –lth* of your /boot folder, with date and time stamp of files.
5. Ensure video size Is < 20 MB to upload into Moodle.
6. If video size is too large, upload into *Onedrive* or *Gdrive*. Include a text file named *video_link.txt*.

Output Section

Screenshot of your Terminal with these command outputs, ‘date’, ‘uname –a’ and ‘dpkg --list | grep linux-image’ to display the newly installed kernel.



Screenshot of your /boot folder, with date and time stamp of files. Apply a red circle or rectangle around your kernel image file, in which you used to install the new kernel.



Component Title	Assignment 1					Percentage (%)	5.0
Criteria	**Score and Descriptors**					**Weight (%)**	**Marks**
	Excellent (5)	**Good (4)**	**Average (3)**	**Need Improvement (2)**	**Poor (1)**		
Delivery	Completed 100% of task requirements Delivered on time, and in correct format	Completed between 75-85% of the task requirements Delivered on time, and in correct format	Completed between 60-75% of the task requirements Delivered on time, and in correct format	Completed at least 60% of the task requirements. Delivered not on time, but with slight delays and in correct format.	Completed less than 50% of the requirements. Not delivered on time or not in correct format (disk, email, printout etc.). Does not comply with requirements (does something other than requirements).	**1.67**	**5**
Implement ation	100 % use of visual aids (e.g. screenshots, arrows comment boxes) to demonstrate evidence of successful implementation	85 % use of visual aids (e.g. screenshots, arrows comment boxes) to demonstrate evidence of successful implementation .	50 % use of visual aids (e.g. screenshots, arrows comment boxes) to demonstrate evidence of successful implementation	25 % use of visual aids (e.g. screenshots, arrows comment boxes) to demonstrate evidence of successful implementation	10 % use of visual aids (e.g. screenshots, arrows comment boxes) to demonstrate evidence of successful implementation	**3.33**	**10**
Submitted Video (Quality & Audio)	Fulfils all video requirements and very well narrated.	Fulfils all video requirements and well narrated.	Fulfils majority of video requirements and well narrated.	Fulfils majority of video requirements but satisfactorily narrated.	Fulfils partially video requirements and satisfactorily narrated.	**5.0**	**15**
TOTAL						**10**	**30**