

## Homework 3

### Quick Start Guide

- Install the latest version Virtualbox. Use installation package based on your operating system in the link below:  
<https://www.virtualbox.org/wiki/Downloads>
- Install the “Extension Pack” according to your installed Virtualbox version with the same link.
- You can set your virtual machine disk by accessing File --> Preferences --> General --> Default Machine Folder.
- Import the file .ova to Virtualbox.
- Start imported operating system in Virtualbox.
- Login as “user” with password “sysprog2019”
- Hint : [https://projects.ui.ac.id/projects/kuliah-sysprog/wiki/Import\\_Virtual\\_Appliance](https://projects.ui.ac.id/projects/kuliah-sysprog/wiki/Import_Virtual_Appliance)

### Part A: Unix Shell Introduction

1. List down five types of shell as well as the advantages and disadvantages.
2. Complete the table below with 20 UNIX common command with the way to use it and explain it briefly.

Command	Example of use	Description
Ls	1. \$ ls 2. \$ ls -lrt	1. lists file in the current directory 2. lists file in the long format
...	...	...

3. Unix provide us an information of a directory or a file by using ls -l command. Below the example of ls -l command's output.

Line	output
1	\$ ls -l
2	total 6004
3	drwxrwxrwx 1 thoriq thoriq 4096 Sep 5 2018 Books
4	-rwxrwxrwx 1 thoriq thoriq 5012547 Feb 8 2018 ujian.pdf
5	-rwxr--rwx 1 thoriq thoriq 4096 Apr 24 2018 input.txt
6	drwxr-xrwx 1 thoriq thoriq 4096 Apr 24 2018 'Term 2'
7	drwxrw-rwx 1 thoriq thoriq 4096 Apr 24 2018 'Term 3'
8	drwxrwxr-- 1 thoriq thoriq 4096 Apr 24 2018 'Term 4'
9	drwxrwx--x 1 thoriq thoriq 4096 Nov 16 2018 'Term 5'
10	drwxrwxrwx 1 thoriq thoriq 4096 Mar 26 21:01 'Term 6'
11	drwxrwxrwx 1 thoriq thoriq 4096 Sep 17 23:08 'Term 7'

- What does the line number 2 mean?
- Explain briefly what each column from row 3 to 11 tells us.
- According to the column number 1 from row 3 to 11, explain in detail why is there 10 characters with 5 different kind of characters (d,r,w,x,-), what does every character stand for?
- What are the differences (in terms of its behavior) between the ‘column 1 characters’ that associated to a file and to a directory?
- If I want to create a new directory or new file, what is the ‘column 1 characters’ that associated to them? Why is like that?

4. Answer these questions briefly.

- What are Shell variables?
- What is the difference between \$\* and \$@?
- What are the differences between & / &&?
- What is the lifespan of a variable inside a shell script?

### Part B: Simple Program

1. What is the output program below. Explain what does \$# stand for?

```
#!/bin/bash  
  
echo $#
```

2. Let's find out about Fortune and Cowsay. Install and try it. Explain in brief how to install and its behavior.



3. Download unformatted JSON here (<http://bit.ly/unformatted-json-sysprog1920>). Write a bash script that read a file you have already downloaded and beautify it into formatted JSON. Write down your program (bash script) as well as how to run it.

**Note:** don't hardcode the path of the unformatted JSON file!

**Hint:** don't overthink, use as many resources you can get.

### Submission Format

1. Answer all these questions in a PDF format named answer.pdf and wrap it in tar.gz format with format name **NPM\_NAME\_CLASS\_HW3.tar.gz** (example: 0806444700\_TONNY\_A\_HW1.tar.gz). Add any additional files if needed.
2. If you collaborate with someone, please write your collaborator's name.  
**Plagiarism will be sanctioned with 0 score for this assignment.**
3. Submit your answer via Scele.