PR 5

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

Part A: Transfer Data via Bluetooth from Raspberry Pi

One day, dennis felt bored and wanted to do something. He then remembered that he just bought a new Raspberry Pi. First, he install Raspbian OS on the Raspberry Pi. Next, he updated and installed some packages. Then he wants to save "secret nh code" from his PC to Raspberry Pi. Because Dennis was feeling creative, he tried to transfer his data using bluetooth, but he didn’t know how. Please help Dennis **transfer his data using bluetooth by making a step-by-step report what needs to be done. Attach screenshots to help writing the report and explain the obstacles on report.pdf.**

Hint: rfcomm, putty, sdptool, serial communication, bluetooth, raspberry pi

Part B: Advanced Shell Scripting (Syste4148264m Information Menu)

Create a script that displays 5 menu choices regarding system information on
Your VirtualBox. The conditions are as follows:

- The first option will display the username, operating system used, uptime along with how many users, IPs, and hostnames.
- The Second Option will briefly display all your hardware information.
- The third option will display memory size and free memory, statistical system memory information, including the list of applications that use the largest CPU performance.
- The fourth option, create a submenu that contains 2 menus, namely:
    - CPU: displays details about your cpu.
    - Block Device: displays the storage devices on your system
- The fifth option, exit from script

Name the script **sysinfo.sh** and the documentation is on the **report.pdf** file.

Hint:

- lshw, free, vmstat, ps, lscpu, and lsblk
- sed and awk for manipulating output

Output Example:

```
Sab Nov 10 22:09:48 WIB 2018
============================
          MAIN MENU
============================
1. Operating System Info
2. Hardware List
3. Free and Used Memory
4. Hardware Detail
5. Exit
choose 1-5:
```

```
choose 1-5: 1
------------------------------------------------------------
                    SYSTEM STATUS
------------------------------------------------------------
Username : fadhlan
OS : Linux 4.15.0-36-generic
Uptime : 2 min,  1
IP : 10.0.2.15
Hostname : fadhlan-VirtualBox
Press [Enter] key to continue...
```

```
choose 1-5: 2
------------------------------------------------------
                  HARDWARE LIST
------------------------------------------------------
Machine Hardware : x86_64
H/W path      Device      Class       Description
=============================================
                          system      VirtualBox
/0                        bus         VirtualBox
/0/0                      memory      128KiB BIOS
/0/1                      memory      3944MiB System memory
/0/2                      processor   Intel(R) Core(TM) i5-6200U CPU @ 2.30GHz
/0/100                    bridge      440FX - 82441FX PMC [Natoma]
/0/100/1                  bridge      82371SB PIIX3 ISA [Natoma/Triton II]
/0/100/1.1                storage     82371AB/EB/MB PIIX4 IDE
/0/100/2                  display     VirtualBox Graphics Adapter
/0/100/3      enp0s3      network     82540EM Gigabit Ethernet Controller
/0/100/4                  generic     VirtualBox Guest Service
/0/100/5                  multimedia  82801AA AC'97 Audio Controller
/0/100/6                  bus         KeyLargo/Intrepid USB
/0/100/6/1    usb2        bus         OHCI PCI host controller
/0/100/6/1/1              input       USB Tablet
/0/100/7                  bridge      82371AB/EB/MB PIIX4 ACPI
/0/100/b                  bus         82801FB/FBM/FR/FW/FRW (ICH6 Family) USB2 E
```

```
choose 1-5: 3
------------------------------------------------------
                  MEMORY
------------------------------------------------------
***************
     Memory
***************
Size : 3944
Free : 976
**************************
      Memory Statistics
**************************
procs -----------memory---------- ---swap-- -----io---- -system-- ------cpu-----
 r  b   swpd   free   buff  cache   si   so    bi    bo   in   cs us sy id wa st
 1  0      0 2428532  53408 557916    0    0  1035    36  255  508 16  5 76  2
0
**********************************
     Top 10 cpu eating process
**********************************
USER       PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
fadhlan   1213 14.2  6.9 3491672 279660 tty2   Rl+  22:09   0:30 /usr/bin/gnome-
shell
gdm        852  5.3  5.0 3404948 205340 tty1   Sl+  22:08   0:12 /usr/bin/gnome-
shell
root       935  4.7  0.8 448300 35956 ?        Ssl  22:08   0:10 /usr/lib/packag
ekit/packagekitd
fadhlan   1431  2.9  3.7 1384760 150156 tty2   SLl+ 22:09   0:06 /usr/bin/gnome-
software --gapplication-service
fadhlan   1073  2.0  2.2 584472 90540 tty2     Sl+  22:09   0:04 /usr/lib/xorg/X
org vt2 -displayfd 3 -auth /run/user/1000/gdm/Xauthority -background none -nores
et -keeptty -verbose 3
root         1  1.3  0.2 159916  9148 ?        Ss   22:08   0:03 /sbin/init spla
sh
fadhlan   1425  1.1  1.7 1049440 72380 tty2    Sl+  22:09   0:02 nautilus-deskto
p
root       618  0.9  0.7 631104 31228 ?        Ssl  22:08   0:02 /usr/lib/snapd/
snapd
fadhlan   1586  0.8  0.8 798996 36016 ?        Ssl  22:09   0:01 /usr/lib/gnome-
terminal/gnome-terminal-server
Press [Enter] key to continue...
```

```
choose 1-5: 4
============================
      HARDWARE DETAIL
============================
1. CPU
2. Block Devices
3. Back
Choose 1-3: 1
---------------------------------------------
     CPU
---------------------------------------------
Model Name:          Intel(R) Core(TM) i5-6200U CPU @ 2.30GHz
Frequency:             2400.000
cache:            3072K
Press [Enter] key to continue...
```

```
Choose 1-3: 2
---------------------------------------------
     Block Devices
---------------------------------------------
NAME   MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
sda      8:0    0    10G  0 disk
└─sda1   8:1    0    10G  0 part /
Press [Enter] key to continue...
```

```
============================
      HARDWARE DETAIL
============================
1. CPU
2. Block Devices
3. Back
Choose 1-3: 3
back to main menu...
Press [Enter] key to continue...
Sab Nov 10 22:17:04 WIB 2018
============================
          MAIN MENU
============================
1. Operating System Info
2. Hardware List
3. Free and Used Memory
4. Hardware Detail
5. Exit
choose 1-5: 5
Bye Bye....
Press [Enter] key to continue...
```

Part C: KILL DASH NINE!

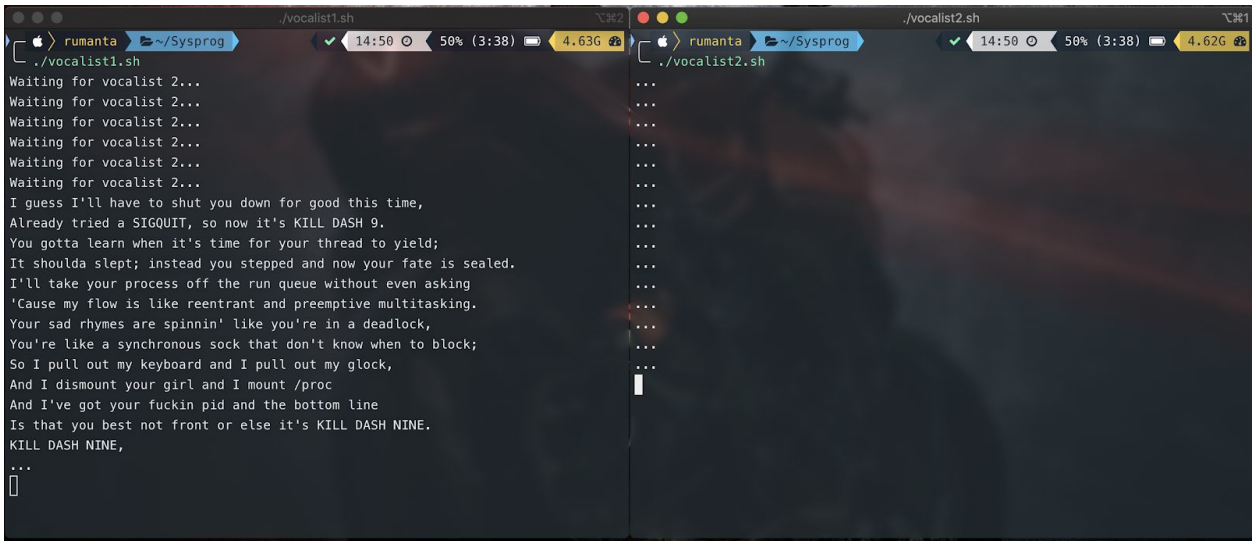
Have you ever heard about a song called *Kill Dash Nine*?! In this section, you are challenged to create a duet by writing 2 shell scripts (because you are a programmer) that sings *Kill Dash Nine* consecutively and harmoniously according to the lyrics provided at this link. Please write both scripts by following those rules:

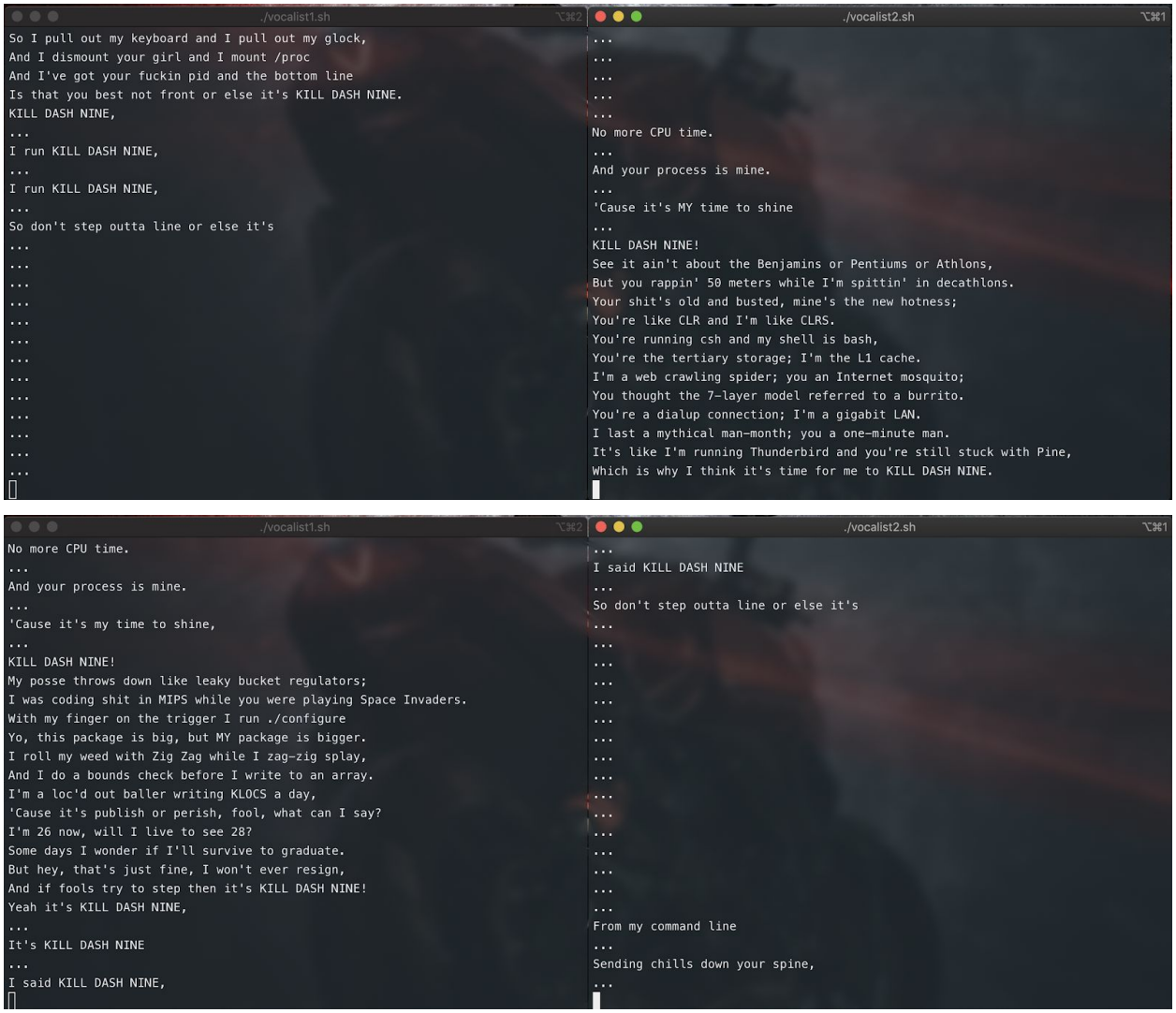
1. Retrieve PID of the other script
2. If the script fails to retrieve the other PID, then it will be stuck in an infinite loop
3. Download the lyrics.txt on the link provided. The script will read the text inside according their turns
4. Send a **signal** to the other script if it already started reading the lyrics
5. If the script receives the intended signal from the other one, then prints out the corresponding lyrics.

Kill Dash Nine's lyrics is divided into 8 verses which also has 4 refs. The 1st and 5th verse belongs to **vocalist1**. The 3rd and 7th verse belongs to **vocalist2**. The following below is one of the parts in the lyrics:

```
1#I guess I'll have to shut you down for good this time,
2#No more CPU time.
```

Please note that there are 2 special characters in front of each line in the lyrics. The first one indicates which line that the vocalist should sing. **'1'** means it's vocalist1's turn, otherwise, **'2'** means it's vocalist2's turn. Then, the second character **'#'** is a separator between the vocalist's turn and the line of lyrics.





Please name the scripts with **vocalist1.sh** and **vocalist2.sh**.
Hint: Use **sleep** command and print "..." if the script doesn't receive any signal.

If you have succeeded in creating both scripts, please answer the following questions.

1. Please explain briefly how does the scripts work!
2. Is there any algorithm that you use? What are them, and why do you use them in this assignment?
3. What are the signals that you use to complete the scripts? Please elaborate the reasons why do you use them.
4. Please explain what happens if you do SIGTERM and SIGKILL when both scripts are running.
5. Please explain what happens if you do SIGQUIT when both scripts are running. What makes it different with case number 4?

Hint: Take a look at Signal's slides on page 24 as references.
Write down all of the answers into a documentation named **report.pdf**.

Submission Format

1. Answer all these questions with the format you asked and wrap it in tar.gz format with format name NPM_NAME_CLASS_HW5.tar.gz (example: 1606812345_DENNIS_A_HW5.tar.gz). For this assignment you need to submit **report.pdf, sysinfo.sh, vocalist1.sh, and vocalist2.sh**. 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.