Operating Systems (10904-01 and 10904-02)   **FS 2022**

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Exercise 0: Linux Environment   (0 points)

Given: February 25, 2022
Deadline: March 04, 2022

Objectives

- Setup a Linux environment to work on the Operating Systems (OS) exercises.

    - If you do not have a Linux environment, create a Virtual Machine (VM) with VirtualBox 6.1 and install Ubuntu 21.10 in that VM, see **Tasks 1-4**.

    - If you already have a Linux environment on your machine where you can work on the exercises, you can skip **Tasks 1-3** and directly go to **Task 4**.

- **Mandatory: Upload a screenshot of your output from Task 4** (see example output in Figure 24) to ADAM as a solution to Exercise 0 (https://adam.unibas.ch/). This exercise will ensure that you have an appropriate Linux environment to progress with the future OS exercises.

Instructions

- This exercise contains instructions to download, install, and setup a Linux Operating Systems (OS) environment, which is required for the OS course exercises.

- **Please answer this doodle poll until the end of March 02, 2022:** https://doodle.com/poll/hxt873habxcfqpkh?utm_source=poll&utm_medium=link With this information we will confirm who has access to an appropriate Linux OS environment and those that need help in setting one up. If you belong to the latter group, we will contact you in due time and offer an alternative OS environment to support you in conducting the OS exercises.

- VirtualBox is known to have issues being installed on **Apple devices with the new M1 processor**; all those using a newer Apple computer with the M1 processor will not be able to use VirtualBox.

Task 1: Download VirtualBox 6.1 and Ubuntu 21.10

- Download VirtualBox 6.1 for your respective operating system.
  https://www.virtualbox.org/wiki/Downloads

- Download the *iso file* for Ubuntu 21.10 (this may take a while).
  https://ubuntu.com/download/desktop

Task 2: Install VirtualBox 6.1 and create a VM

- Follow the installation instructions of VirtualBox.
  https://www.virtualbox.org/manual/ch01.html

- Start VirtualBox and create a new Ubuntu VM with default configurations.

*You may refer to the screenshots in **Appendix A: VirtualBox**.*

Task 3: Install and run Ubuntu 21.10 in your VM

- Follow the instructions to install the desktop version of Ubuntu.
  https://ubuntu.com/tutorials/install-ubuntu-desktop

*You may refer to the screenshots in **Appendix B: Ubuntu VM**.*

Task 4: Familiarize with Linux command lines

- Start your Ubuntu VM and open the Terminal.
- Install gcc with the command: **sudo apt install gcc**
- Create the file hello.c (see Listing 1) with the command: **nano hello.c**
- Display on your screen the contents of hello.c with the command: **cat hello.c**
- Compile the C program with the command: **gcc hello.c -o hello.o**
- Execute the compiled program with the command: **./hello.o**
- **Screenshot the output and upload it to ADAM** (https://adam.unibas.ch/).
- Shutdown the Ubuntu VM with the command: **sudo shutdown -h now**

*You may refer to the screenshots in **Appendix C: Command Line**.*

Listing 1: hello.c example

```c
#include <stdio.h>

int main()
{
  printf("Hello World\n");
  return 0;
}
```

Appendix A: VirtualBox
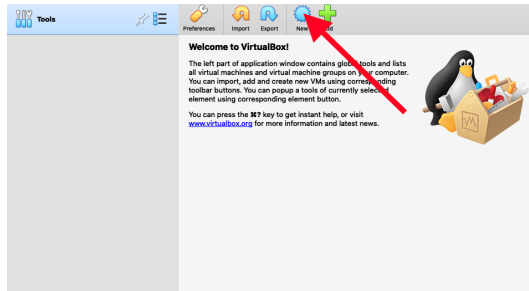
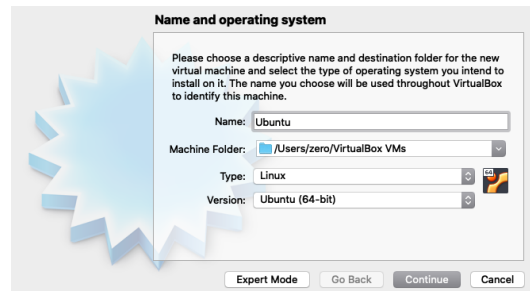Figure 1: VirtualBox step 1.

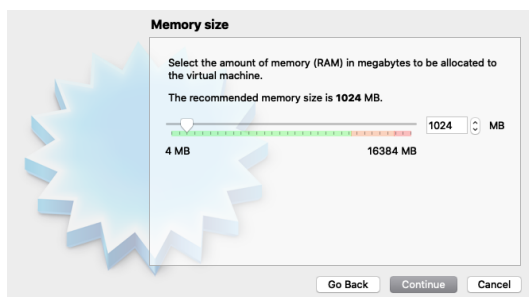Figure 2: VirtualBox step 2.

Figure 3: VirtualBox step 3.
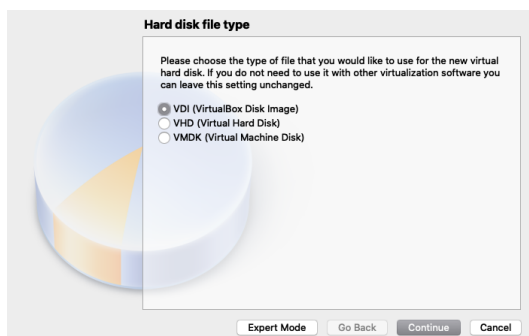

Figure 4: VirtualBox step 4.

Figure 5: VirtualBox step 5.

Figure 6: VirtualBox step 6.
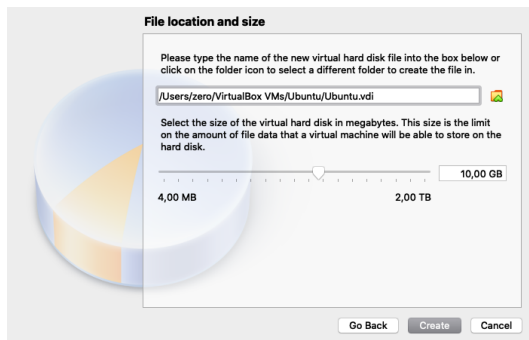
Figure 7: VirtualBox step 7.
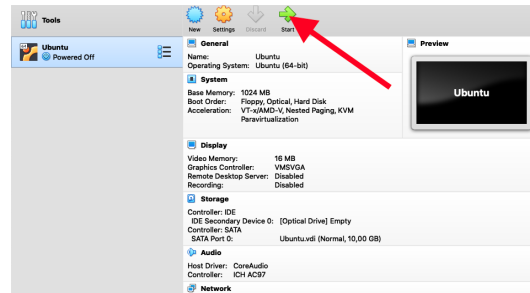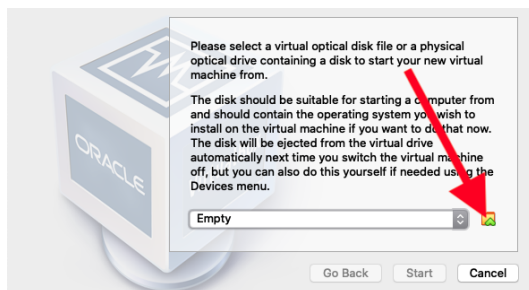

Figure 8: VirtualBox step 8.
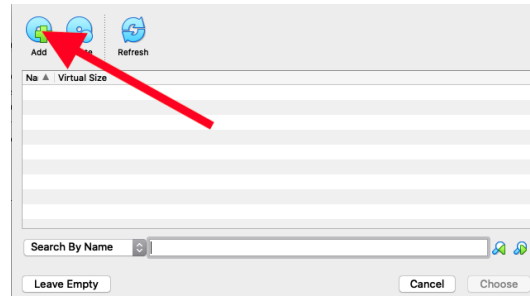

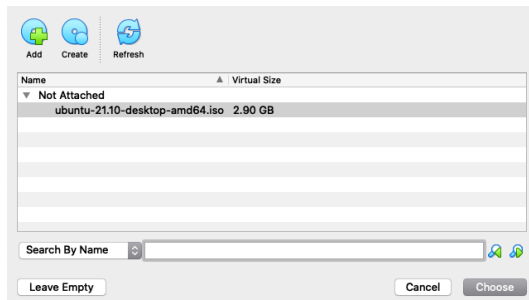Figure 9: VirtualBox step 9.

Figure 10: VirtualBox step 10.
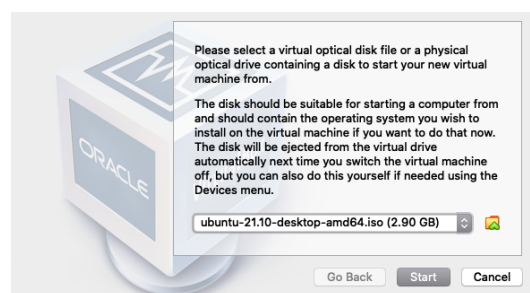

Figure 11: VirtualBox step 11.
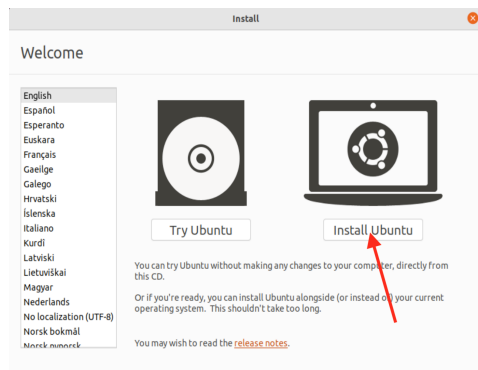

Figure 12: VirtualBox step 12.
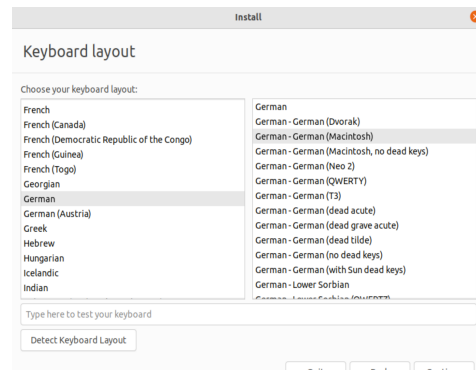
Appendix B: Ubuntu VM

Figure 13: Ubuntu VM step 1.

Figure 14: Ubuntu VM step 2.
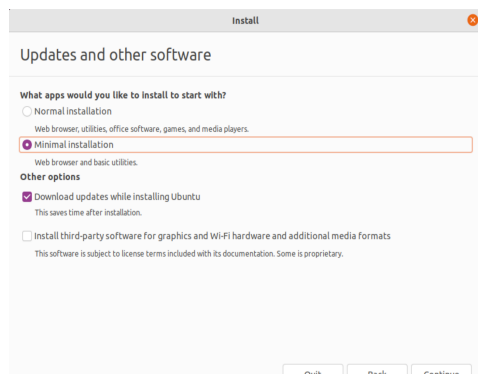
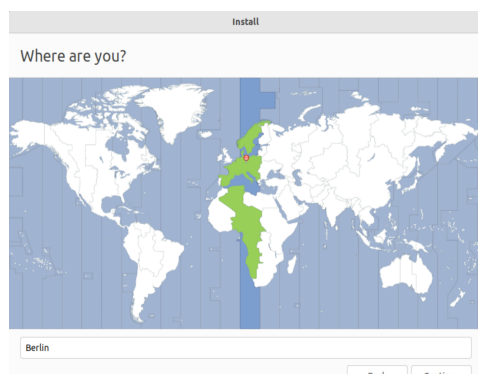Figure 15: Ubuntu VM step 3.
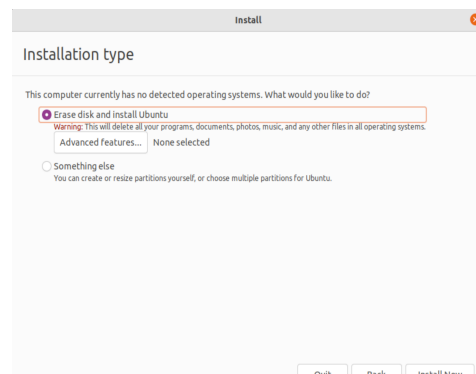
Figure 16: Ubuntu VM step 4.

Figure 17: Ubuntu VM step 5.
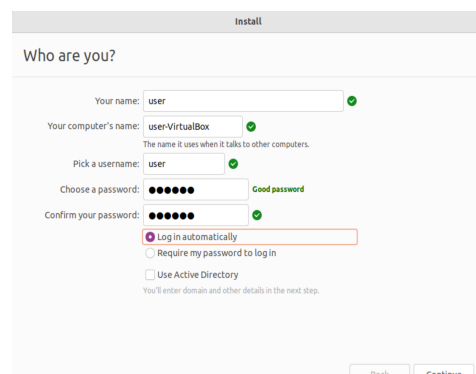

Figure 18: Ubuntu VM step 6.
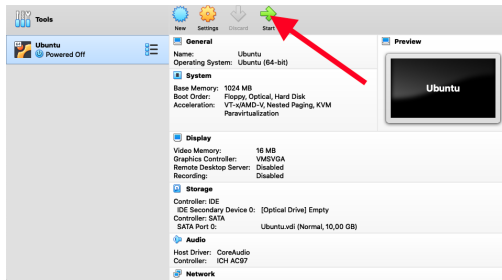
Appendix C: Command Line

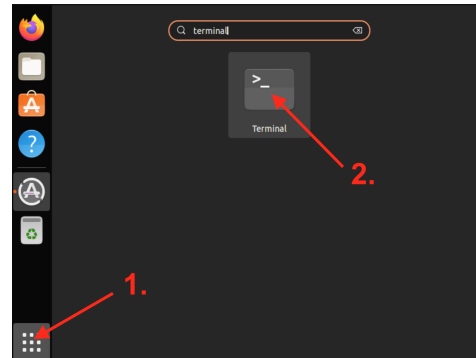

Figure 19: Command Line step 1.

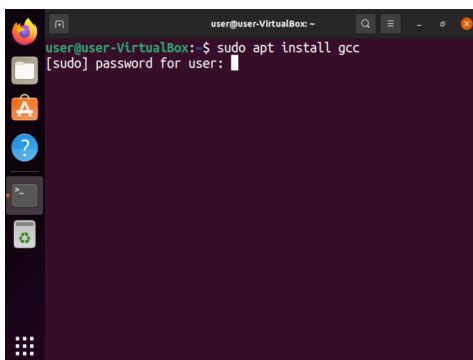Figure 20: Command Line step 2.

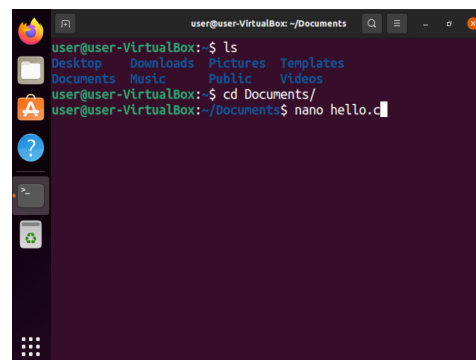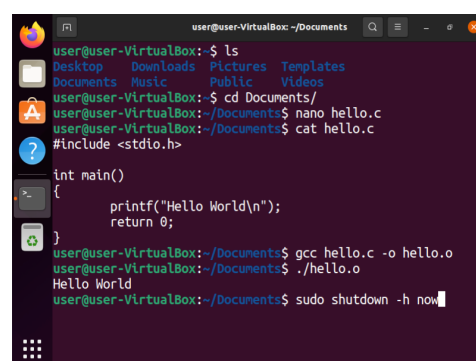Figure 21: Command Line step 3.

Figure 22: Command Line step 4.

Figure 23: Command Line step 5.

Figure 24: Command Line step 6.