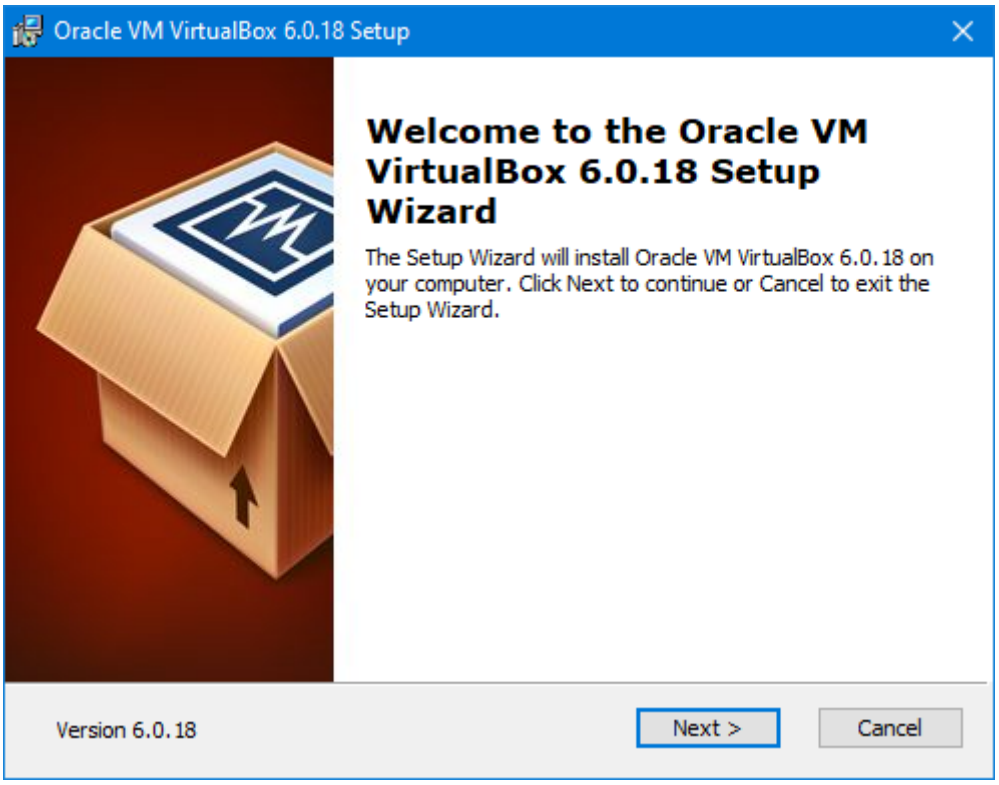
1 Introduction

This document is translated and modified based on a document written for the course TDIU16.

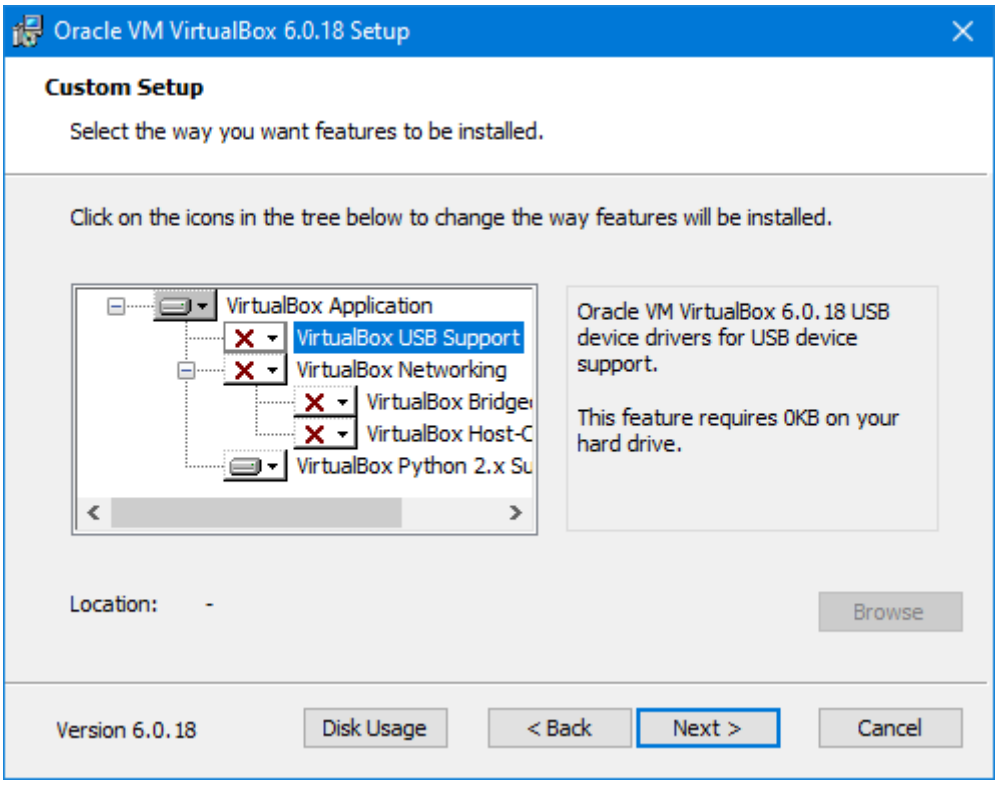
This guide describes step-by-step how you can install a virtual machine running Linux Ubuntu (the same distribution that run in the computer labs). We will install everything that is needed to write and compile C++ programs with the C++17 standard. You will probably want to install a text editors, for example emacs. Instructions for this can be found later in this document.

2 Instructions

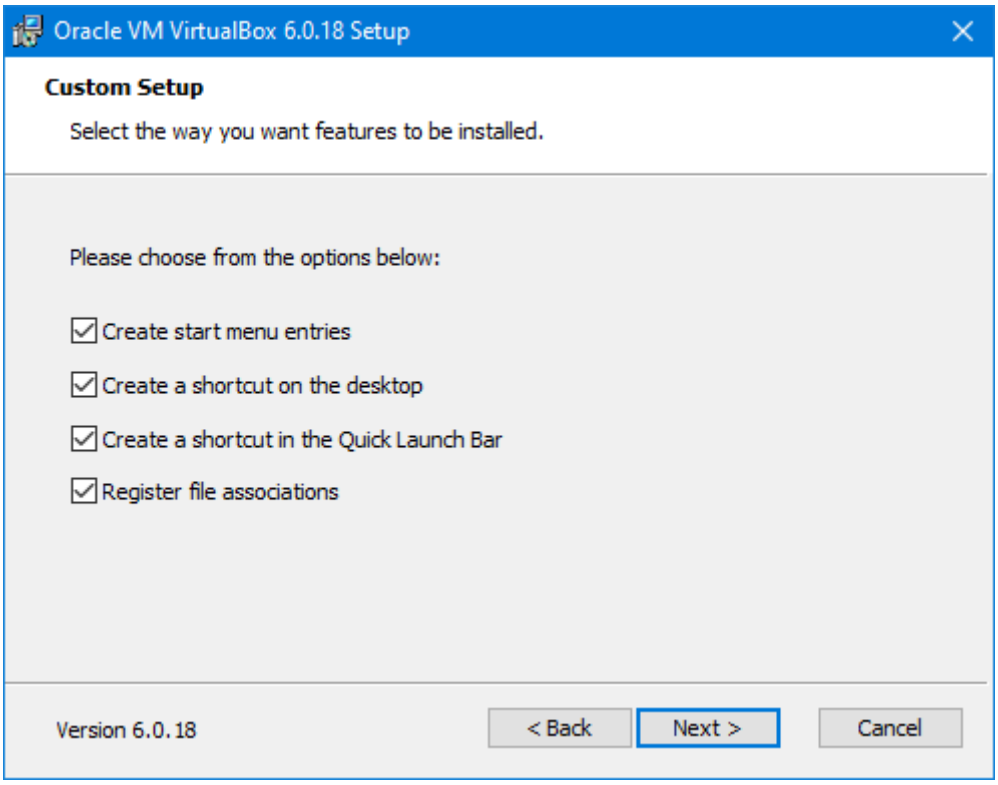
Begin by downloading and installing VirtualBox. It is available at this url: `https://www.virtualbox.org/`. Click on *Downloads* in the left menu and choose the operating system of your computer. In this guide all screenshots are taken from a Windows Machine. Save the downloaded file and run it. You will see this window:



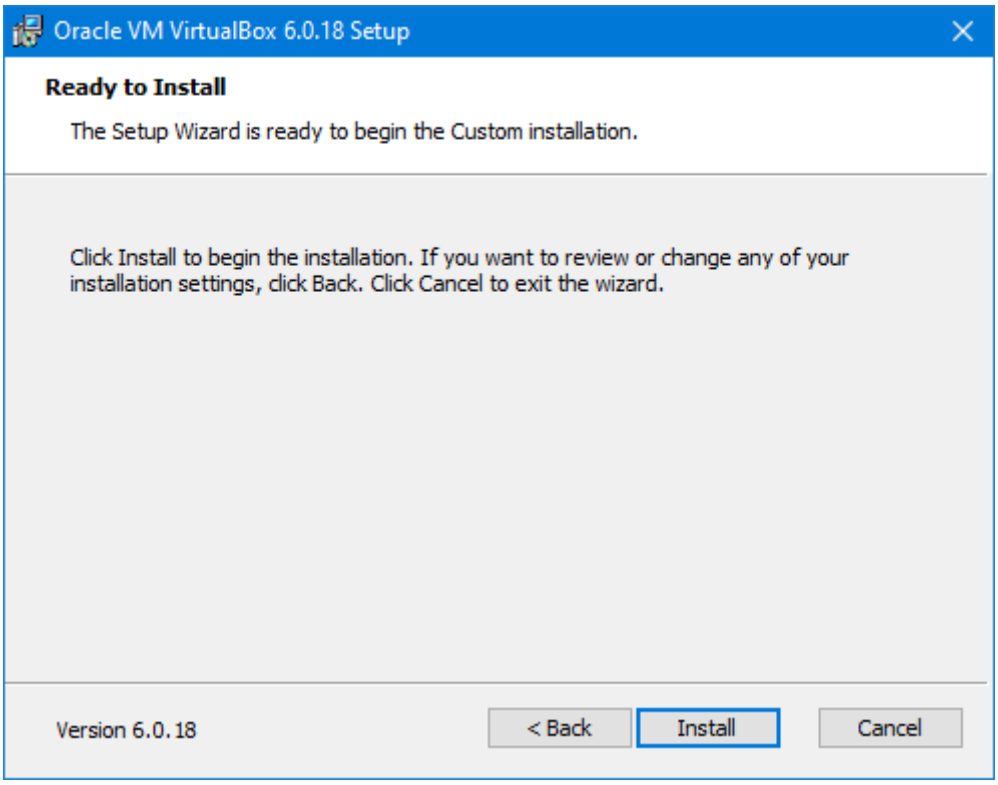
Click *Next*:



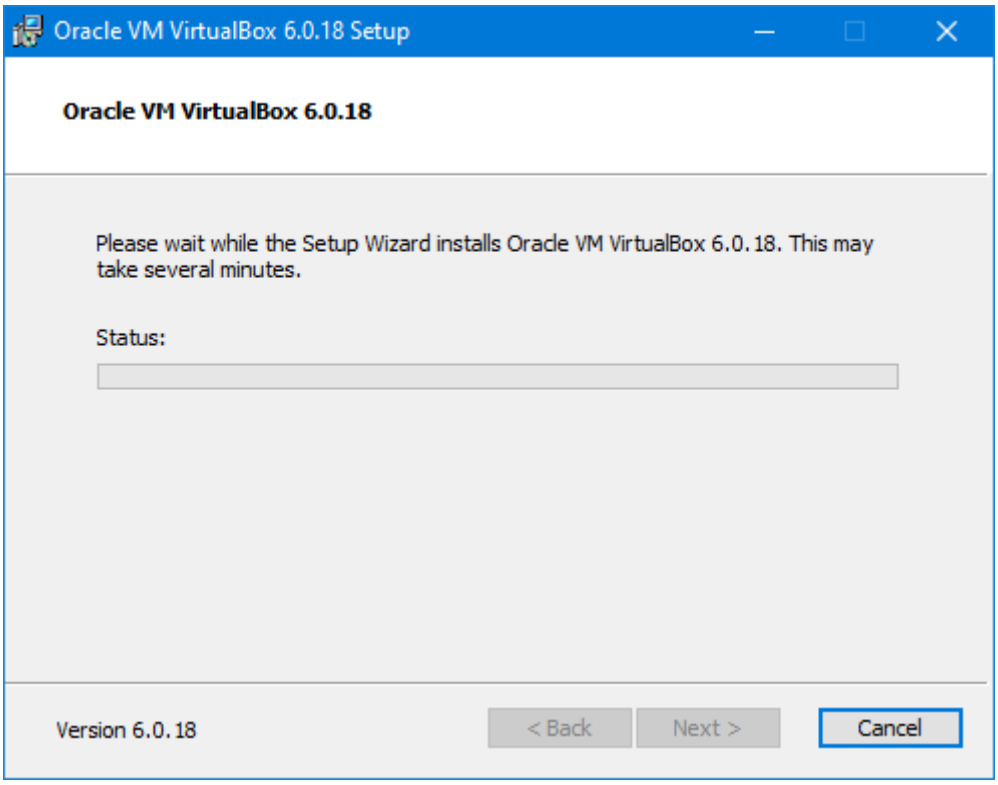
For basic usage we will not need "VirtualBox USB Support" nor "VirtualBox Networking" (we can still access internet from the machine). Click on the icon to the left of them and choose: "Entire feature will be unavailable" (at the bottom, with a red cross). When it looks like the picture above, click *Next* (if you want to install everything some extra steps might appear).



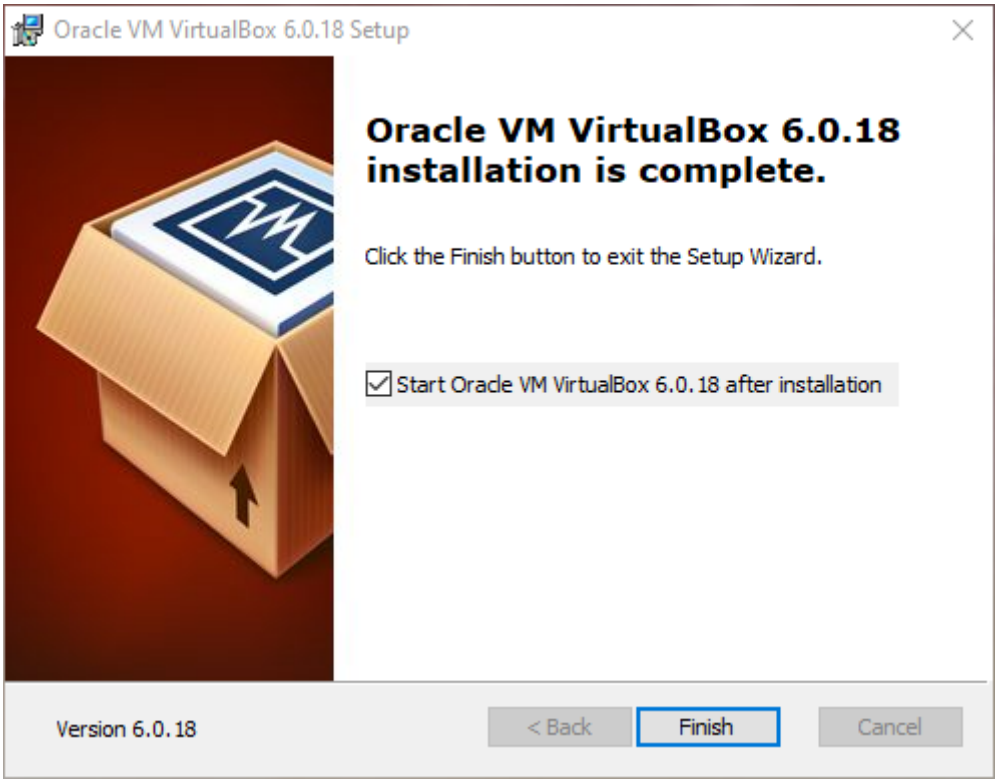
Click *Next*:



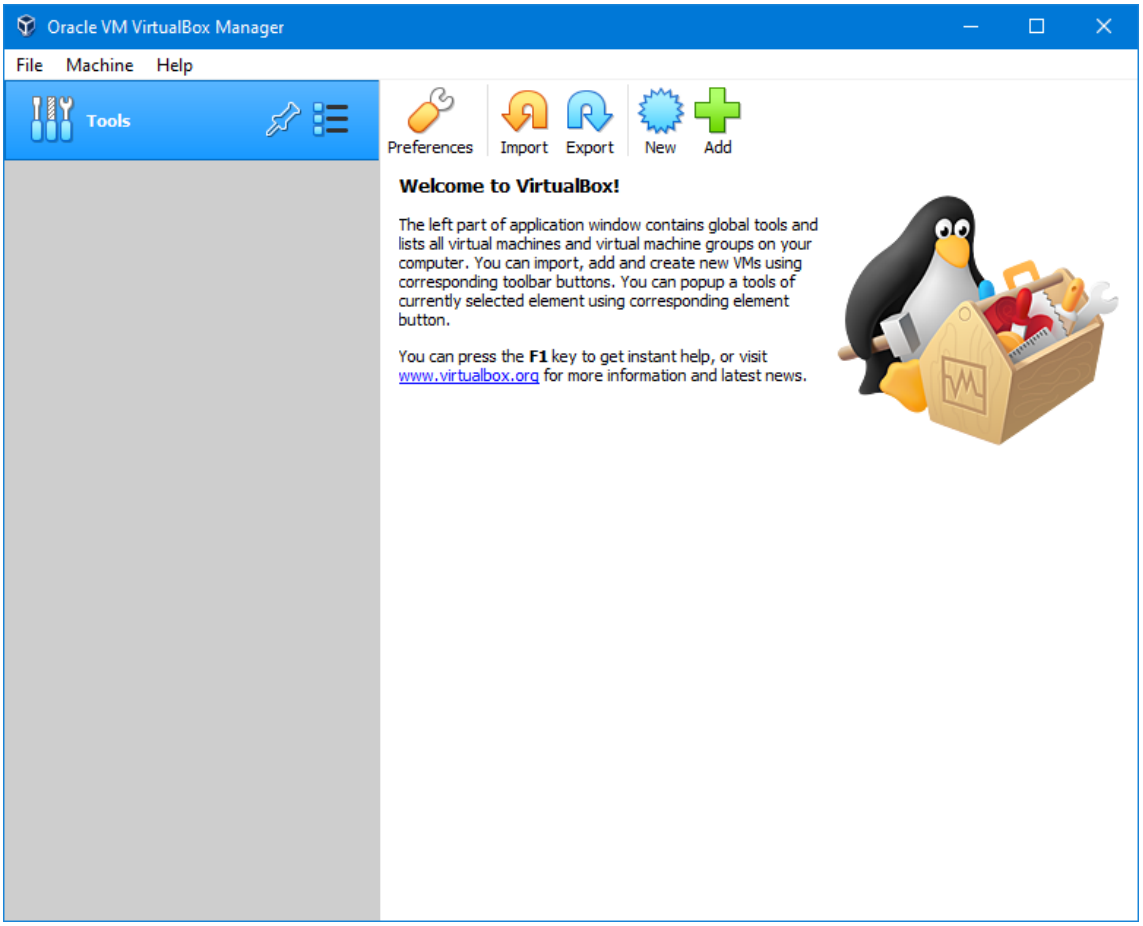
oClick *Next*:



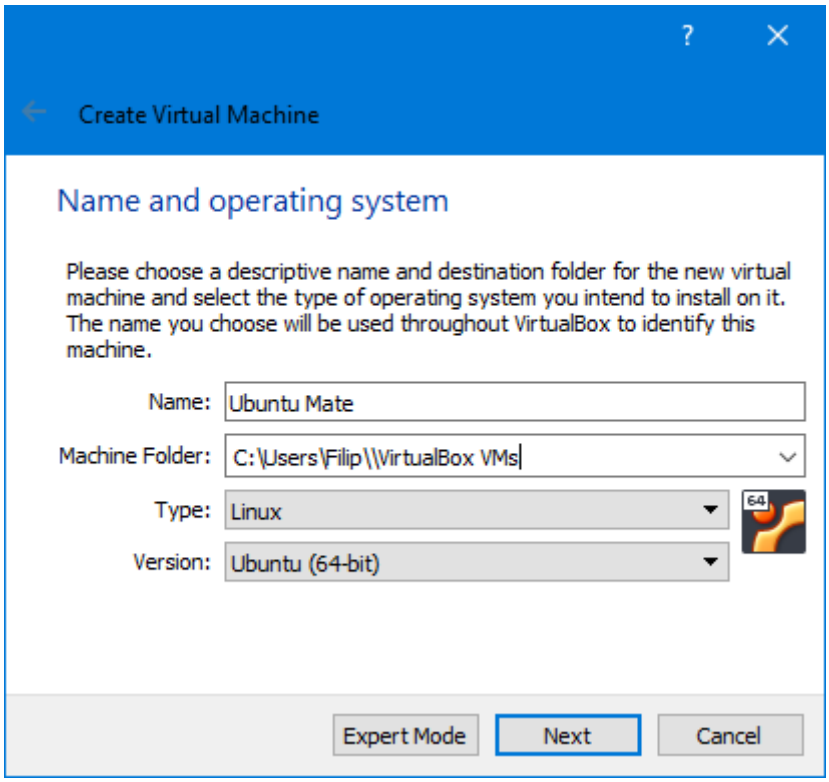
You will se a security warning from Windows. Click *Allow* or corresponding. When everything is done you will see the following window:



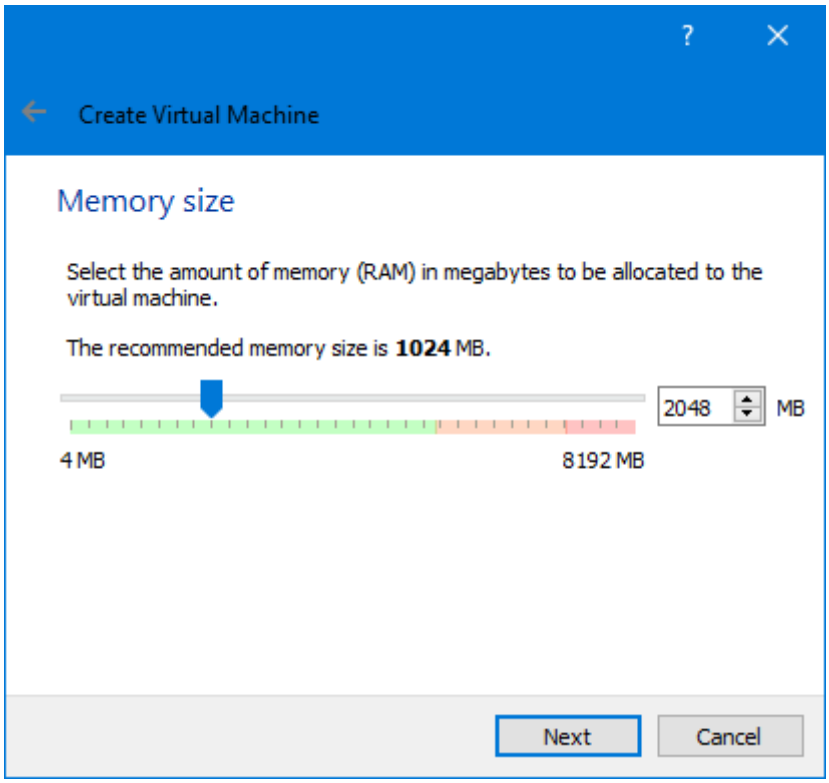
Make sure that *Start Oracle VM VirtualBox...* is checked and then click *Finish*. Then VirtualBox will open:



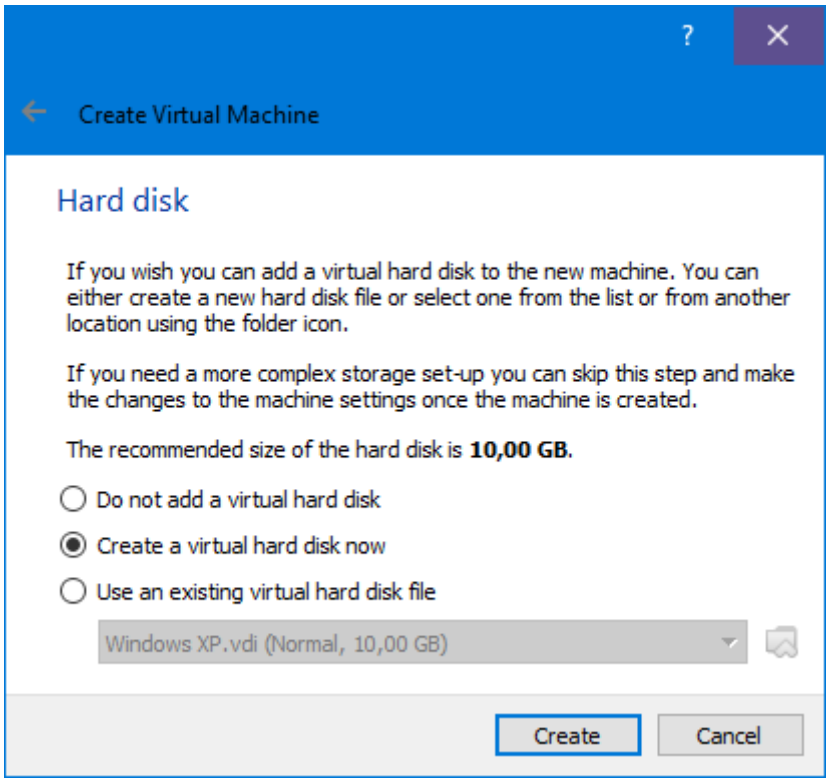
I already have a few virtual machines in the list to the left, you will not. Click *New* (either the button or via *Machine* →*New*):



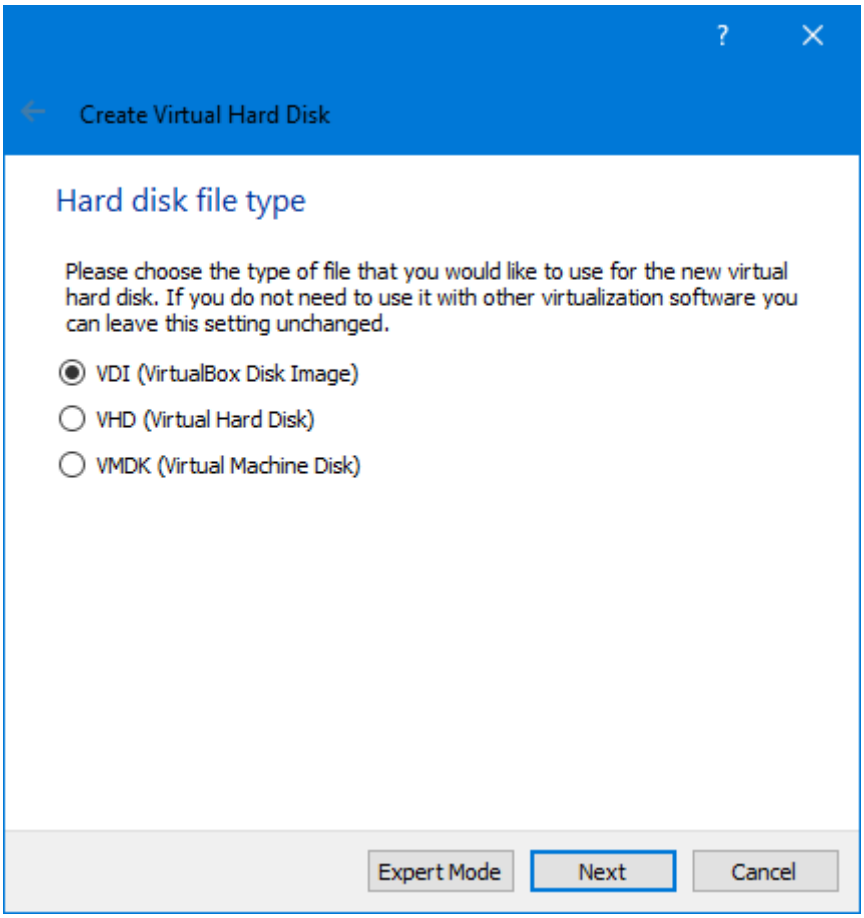
Give the machine the name *Ubuntu Mate*, then *Type* will be set to *Linux* and *Version* will be set to *Ubuntu (64-bit)* automatically. Then click on *Next*.



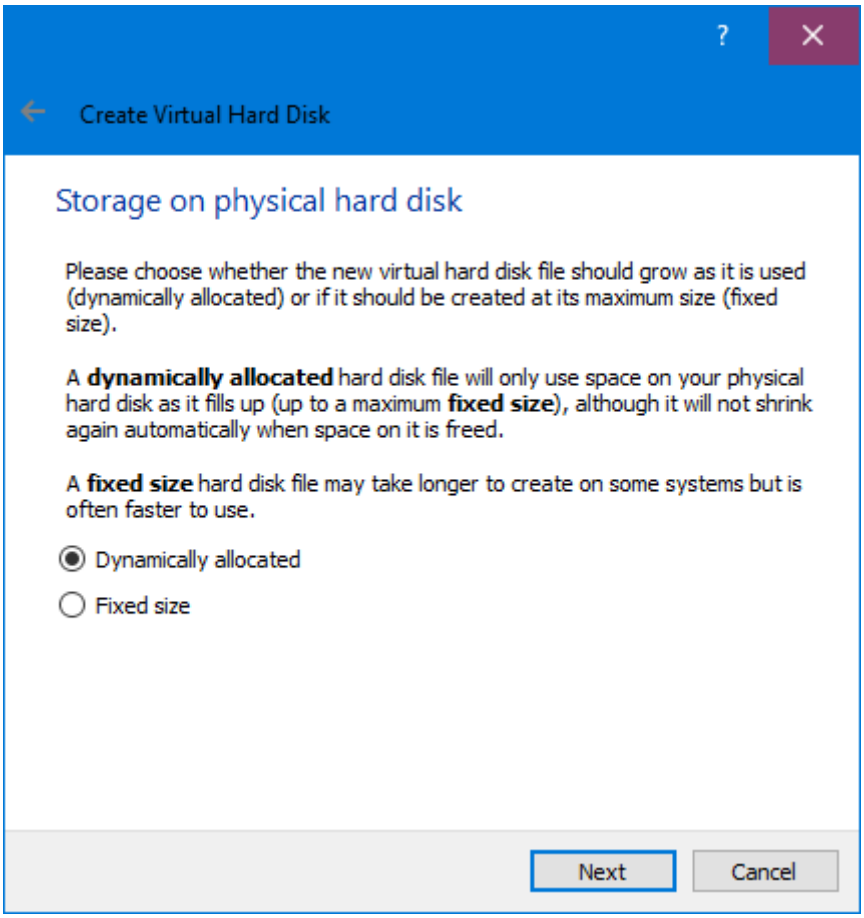
Choose how much memory the machine should have. Choose at least 1024-MB, but you should probably increase it to 2048-MB or more if possible. Make sure that the slider is out of orange or red areas. Click *Next*.



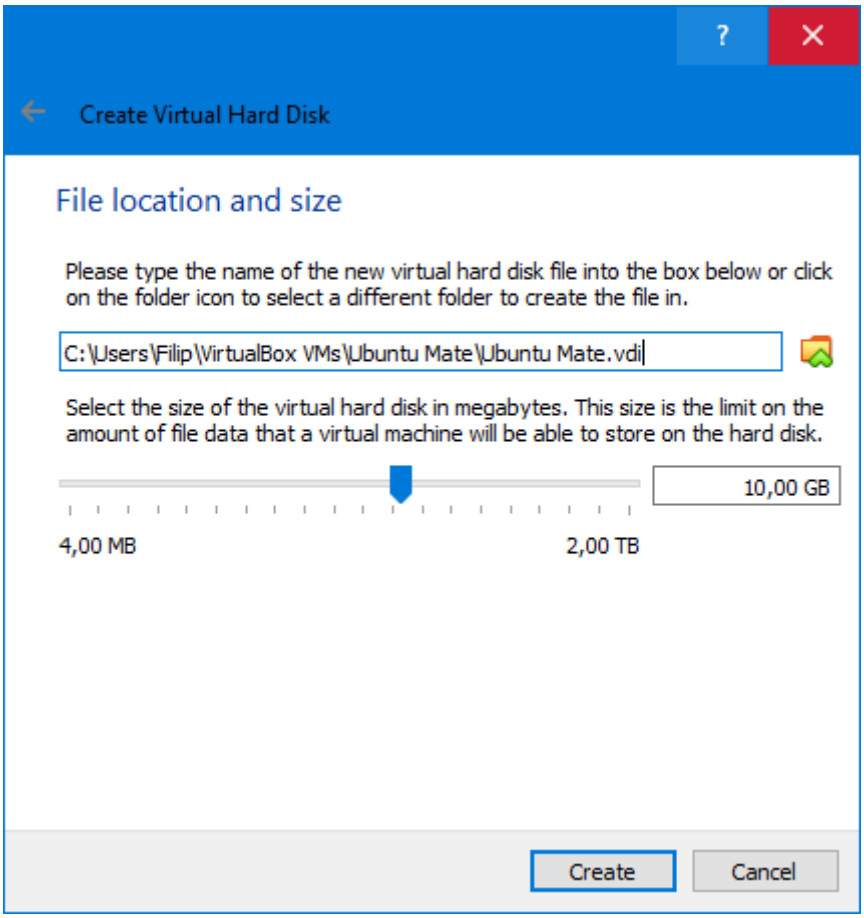
It will now ask you where the data of the virtual machine should be stored. This is done with a virtual disc-file. We want to create on, så choose *Create a virtual hard disk now* och click *Create*. Then the following window will open:



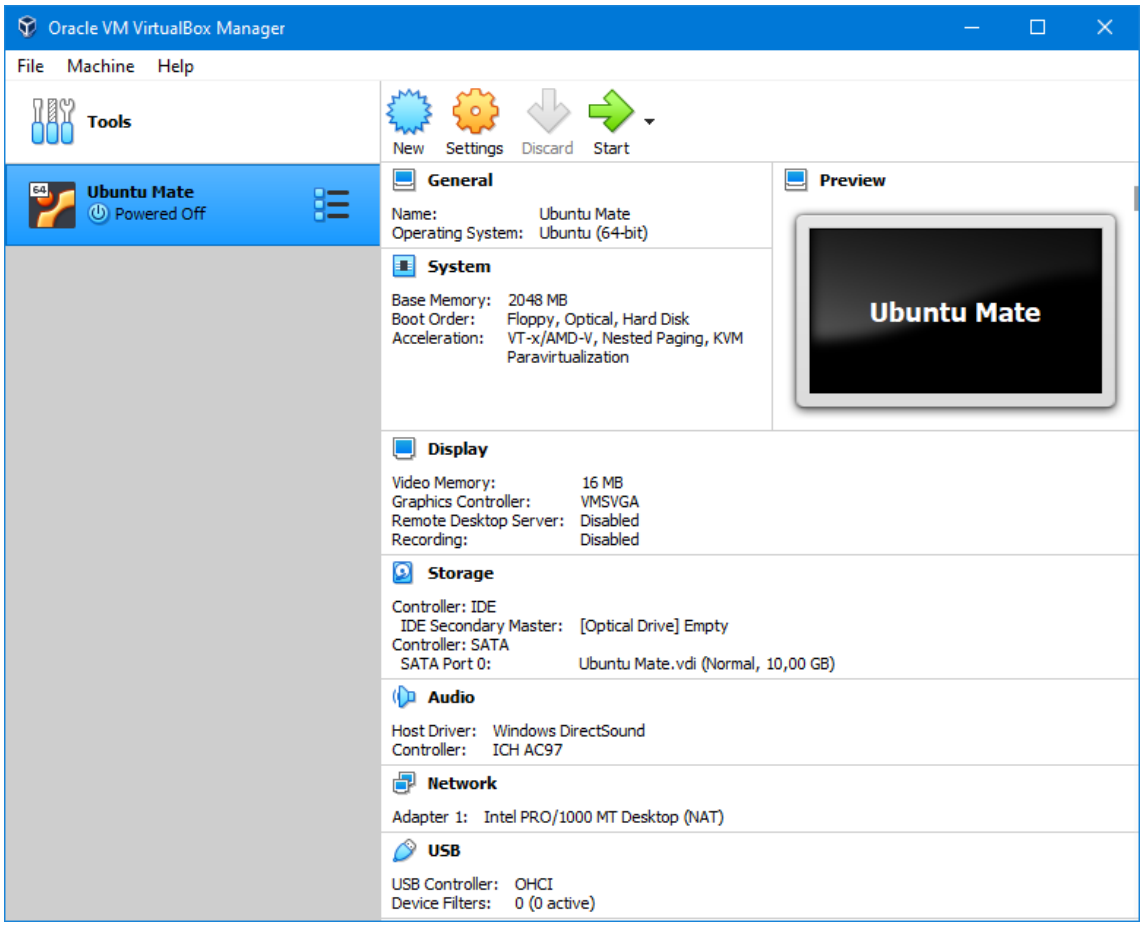
The standard choice, *VDI* works. Click *Next*:



The standard choice, *Dynamically allocated* works. Click *Next*:

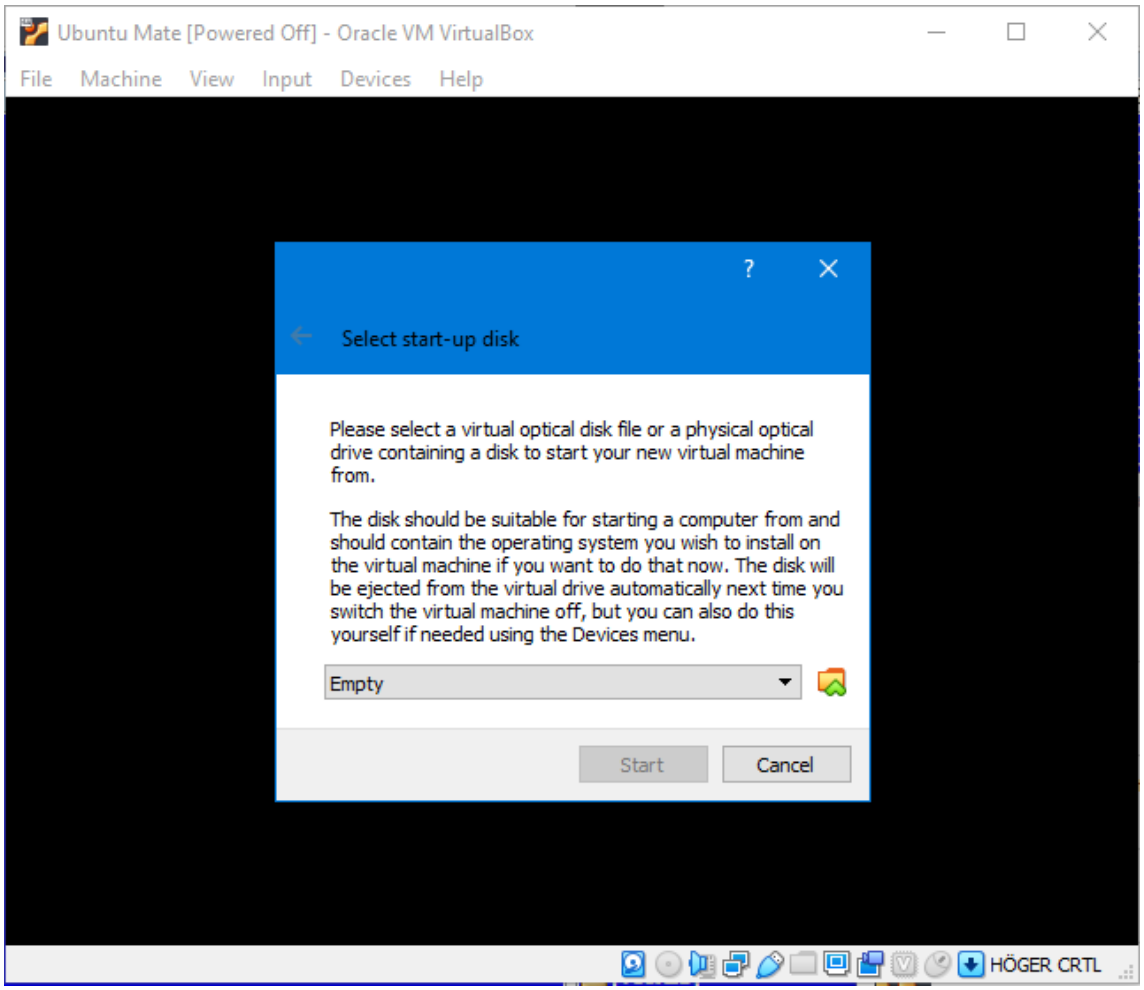


Choose the harddrive size of the virtual machine. The default value, 10 GB works, but if you have more space on your computer than you can increase a bit. If you have little space on your computer, 5 GB should work.

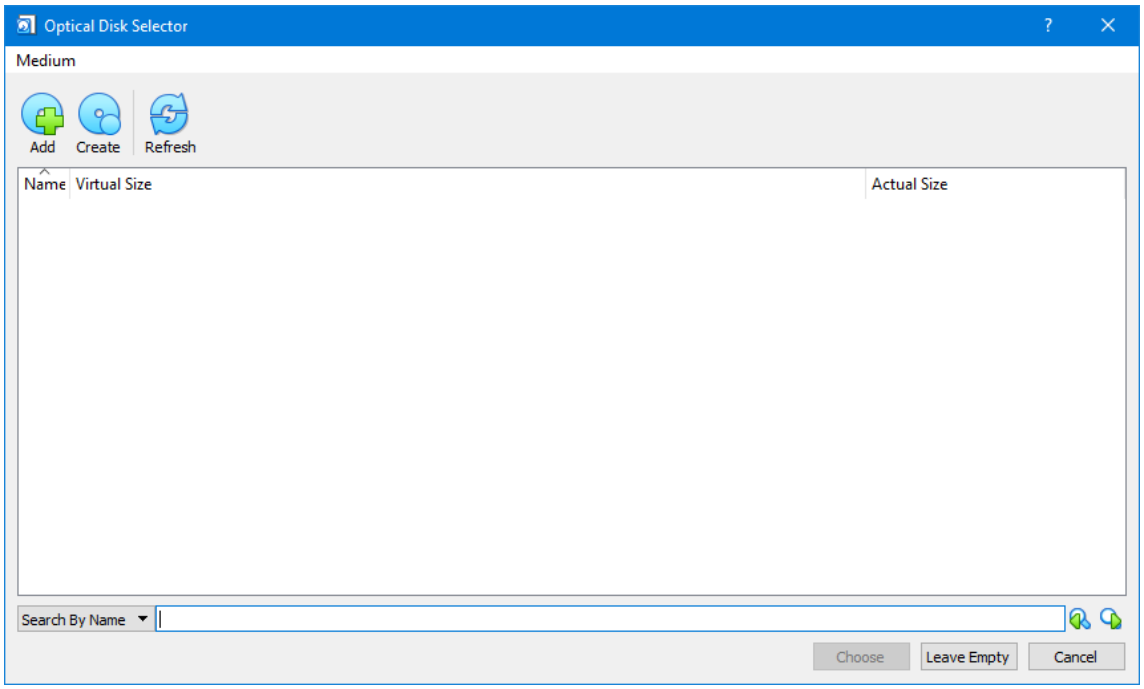


The new machine will now be in the list to the left in the main window of VirtualBox. Make sure that is selected as in the picture. Now we can download Ubuntu. Gå to `https://ubuntu-mate.org/download/` and click on *64-bit* followed by *18.04.4 LTS (Bionic)* and finally *ubuntu-mate-18.04.4-desktop-amd64.iso* and save that file somewhere.

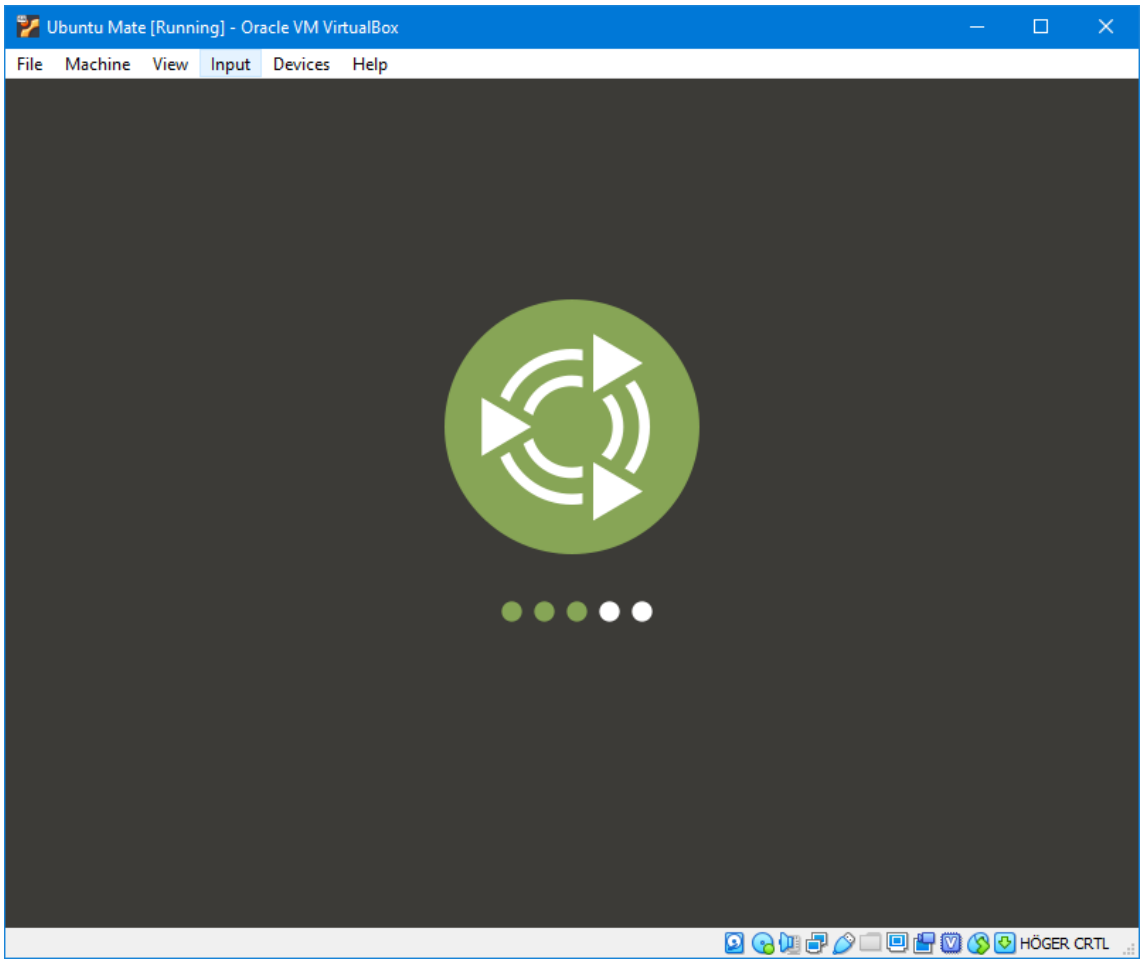
Click on *Start* in the VirtualBox window:



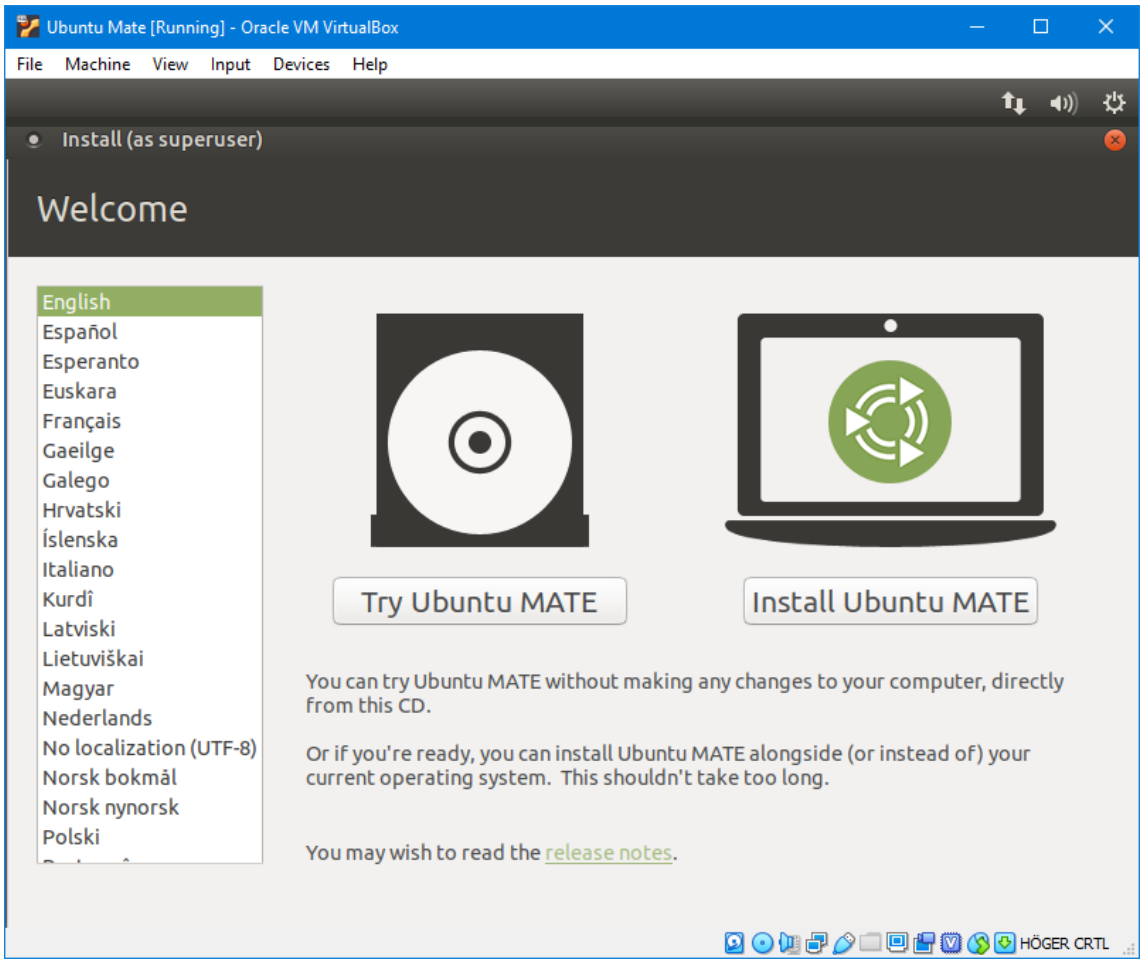
The machine will now begin rebooting. It will ask you to choose an installation medium. Click on the yellow symbol to the right of *Empty*. You will now see the following window:



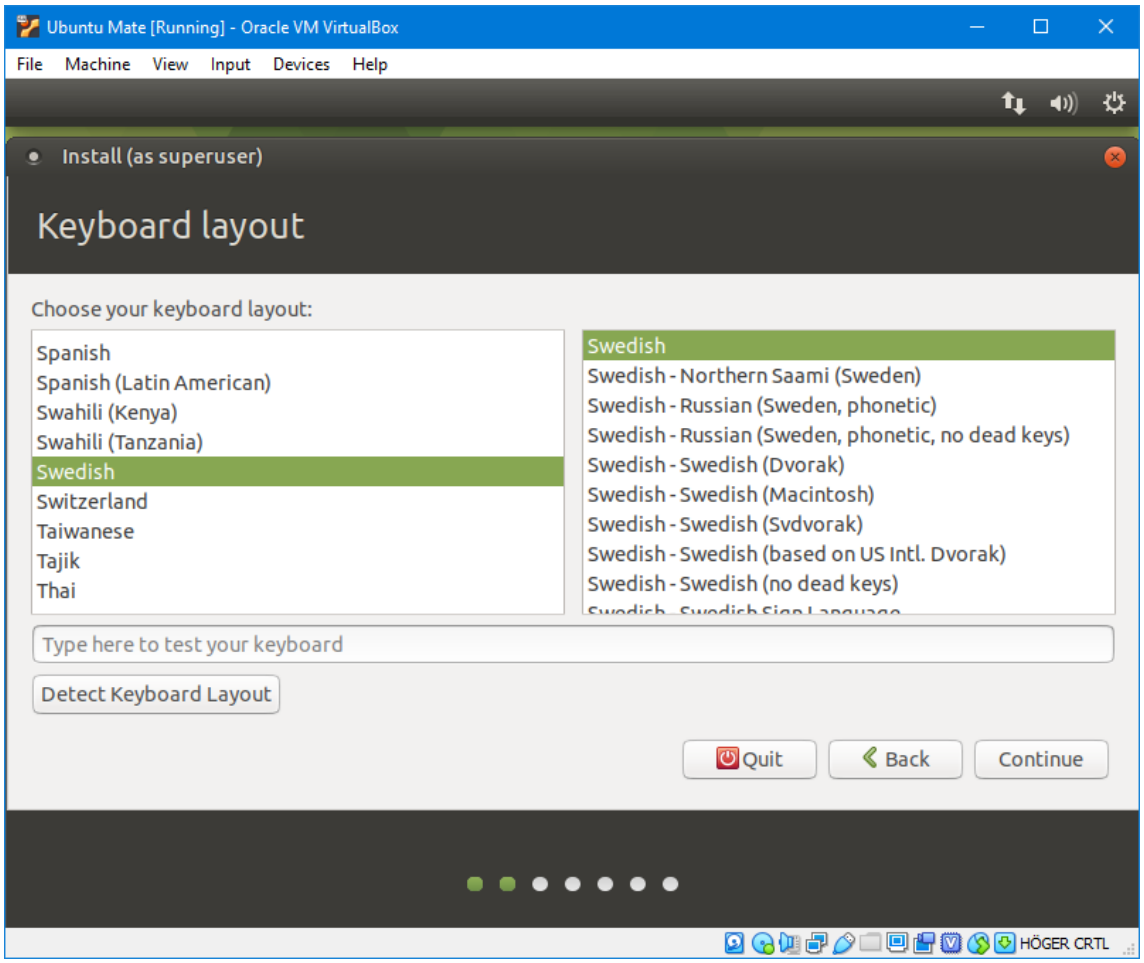
Click on *Add* in the upper left corner and then select the *ubuntu-mate-18.04.4-desktop-amd64.iso* file you just downloaded. Then click *Choose* followed by *Start* in the previous window:



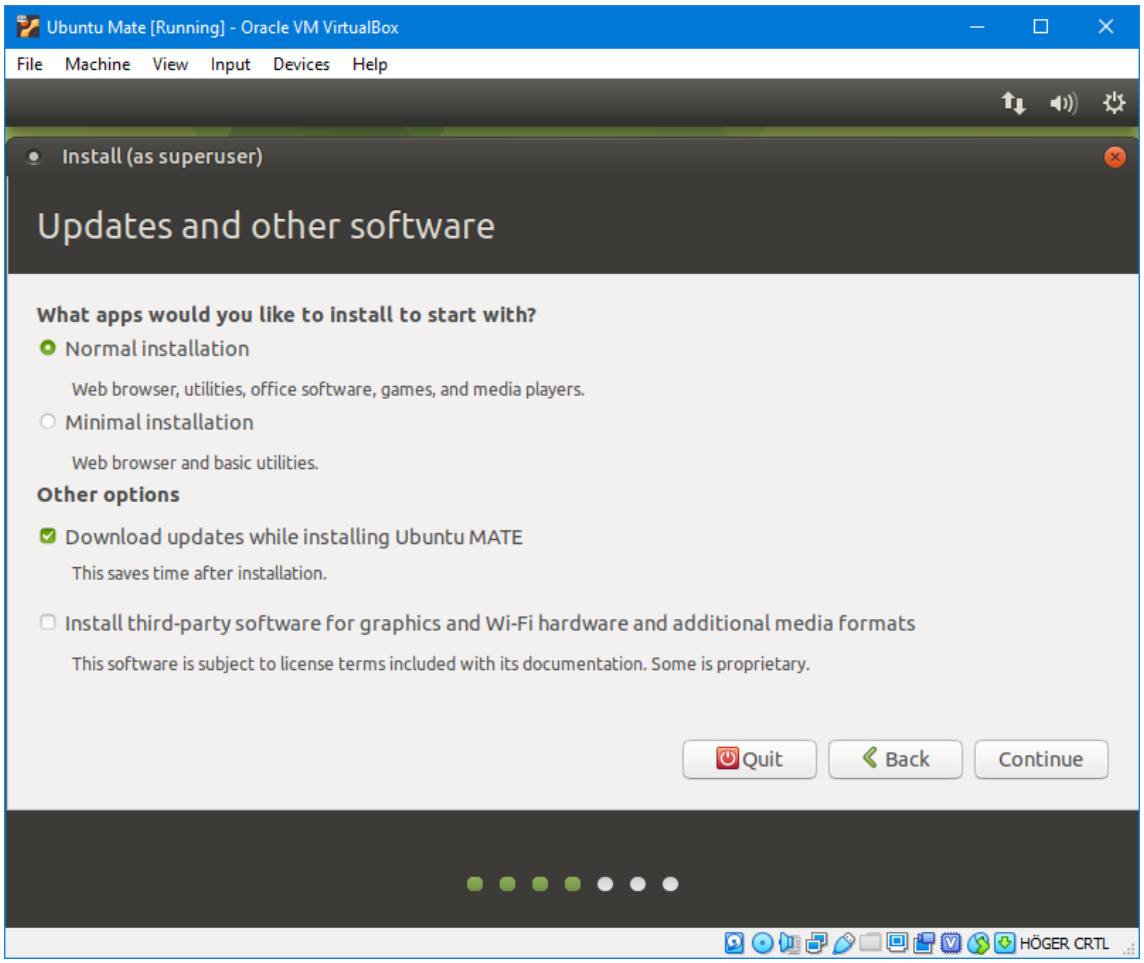
The machine will now boot. It might take a while. I saw a blinking cursor for 20-30 seconds before I saw the screen above, and I started to worry whether or not everything was working. So let it take its sweet time.



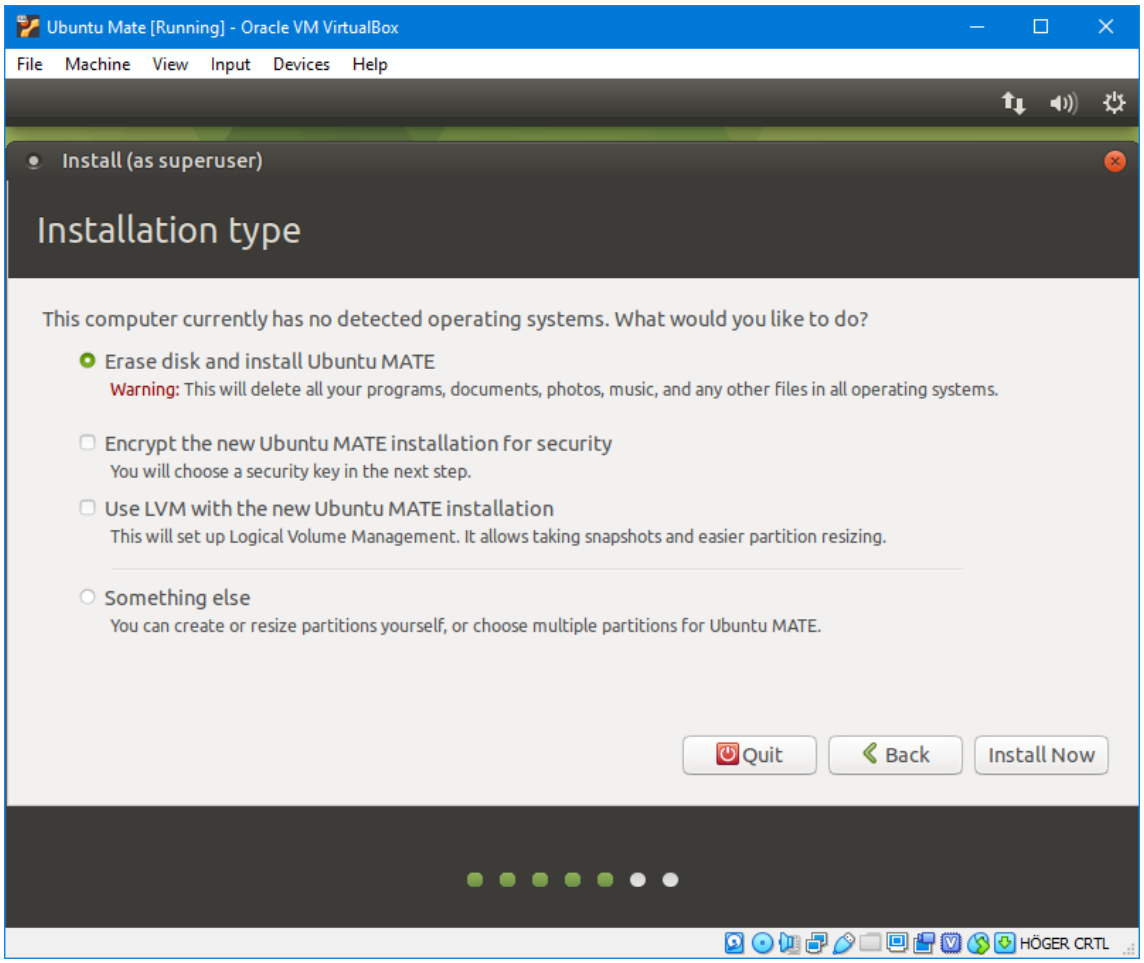
After a while it has started Ubuntu properly and you will see the following screen. Click *Install Ubuntu MATE*.



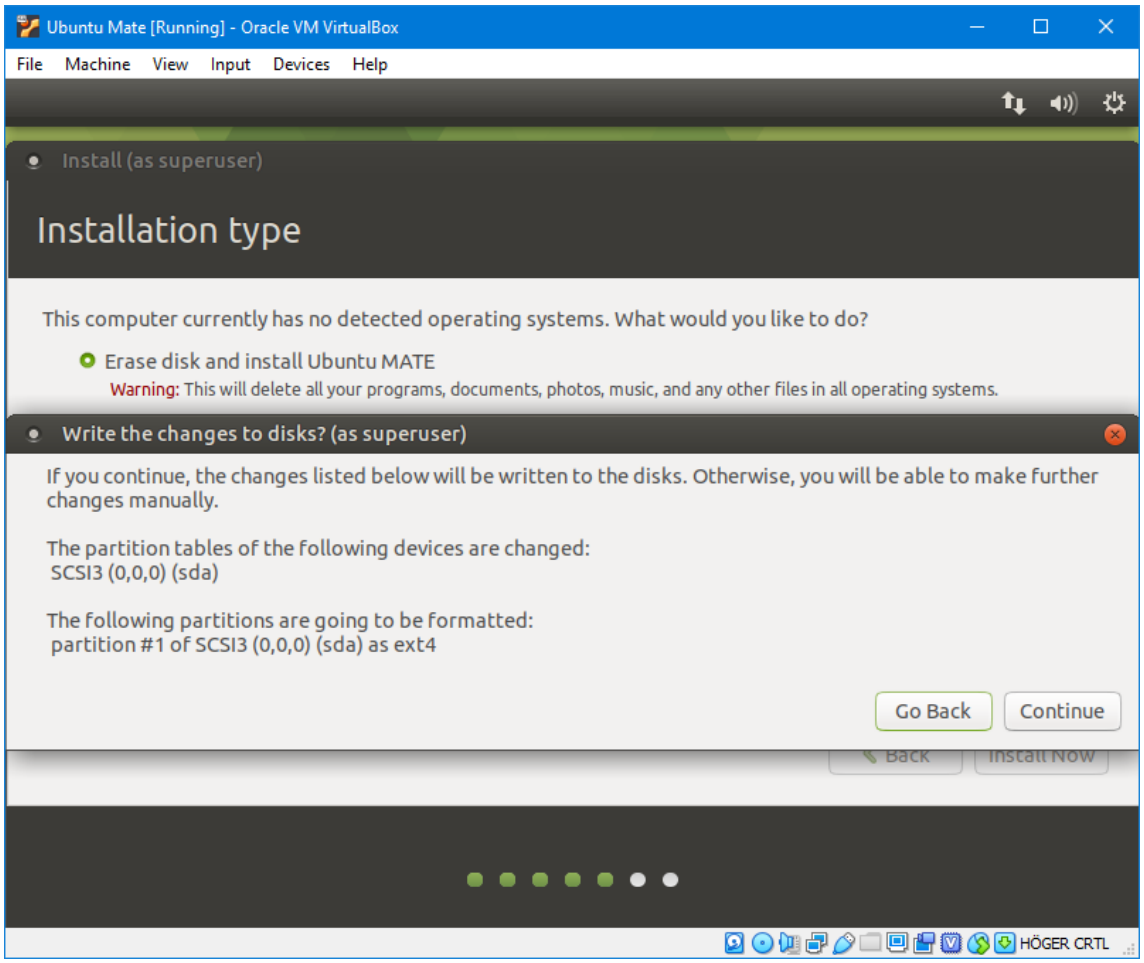
In the next step it will ask which keyboard-layout you want. If you don't want anything special you can select *Swedish* (or your native language) in the list to the left, then corresponding option will be selected automatically in the right list. You can add more layouts once the installation is complete. Click *Continue*:



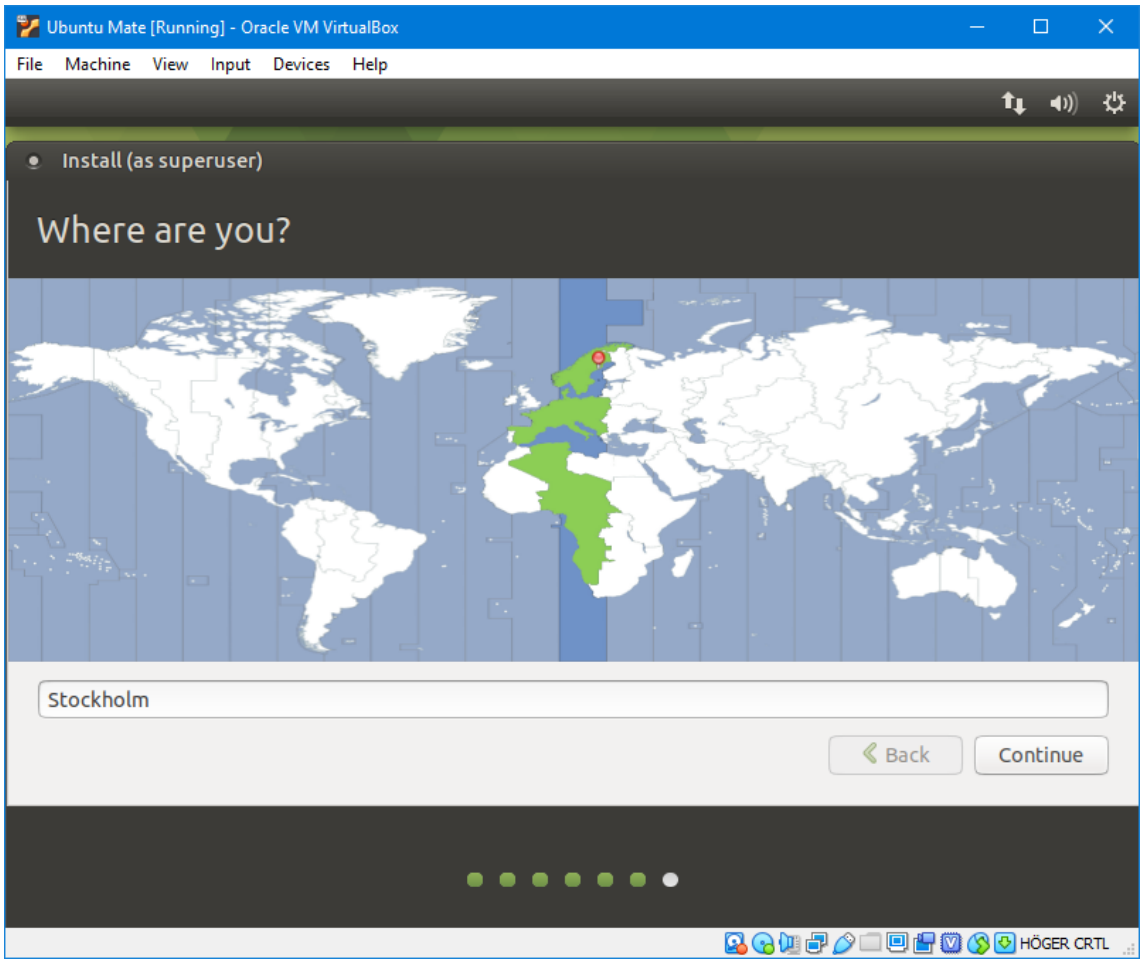
Make sure that *Normal installation* and *Download updates while installing Ubuntu MATE* are checked. If you choose a disc smaller than 10 GB in the previous steps you can also check *Minimal installation* to save on disc space. Click *Continue*:



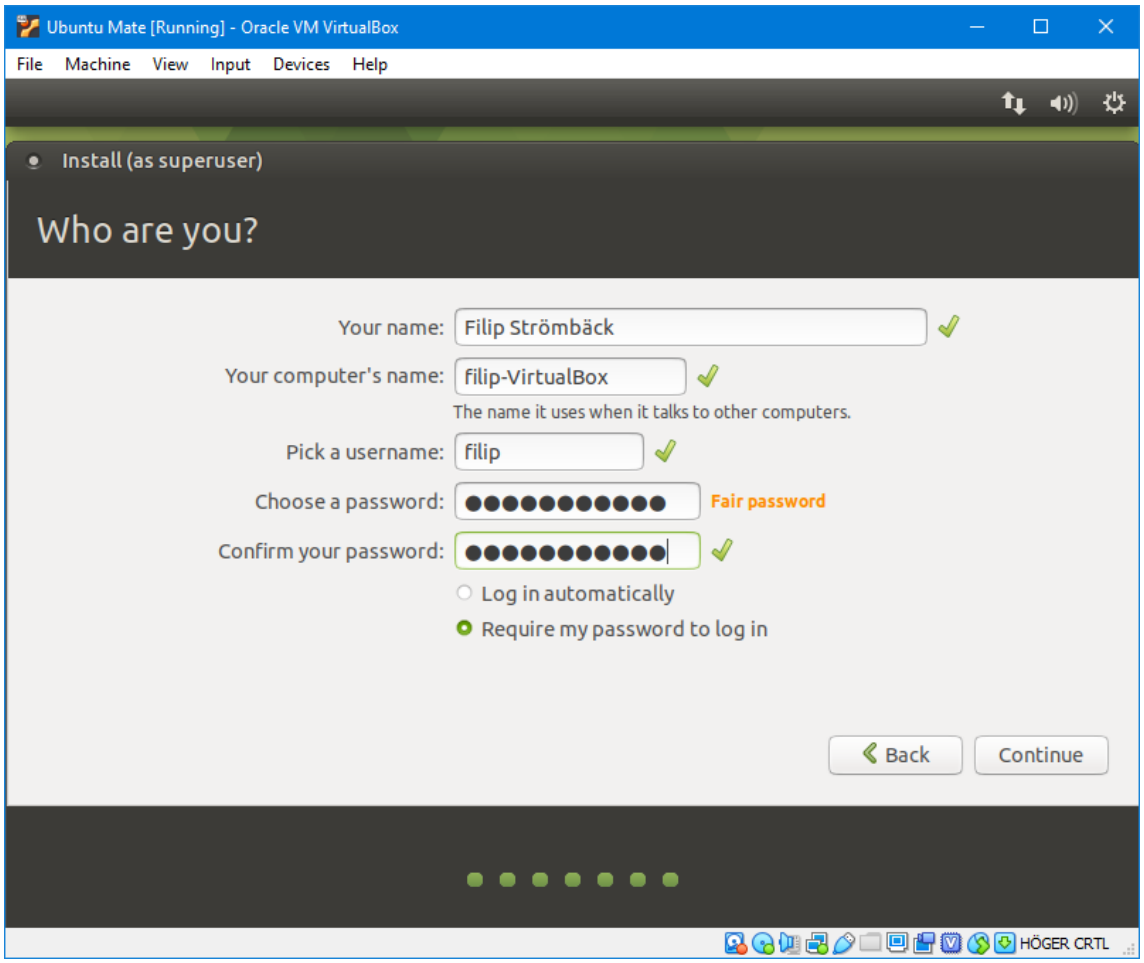
Make sure that *Erase disc and install Ubuntu MATE* is checked. It will *not* erase the disc on your computer, this operation occurs on the virtual disc created for the virtual machine and that disc is empty so there are no problems. Click *Install Now*.



Confirm changes with *Continue*:

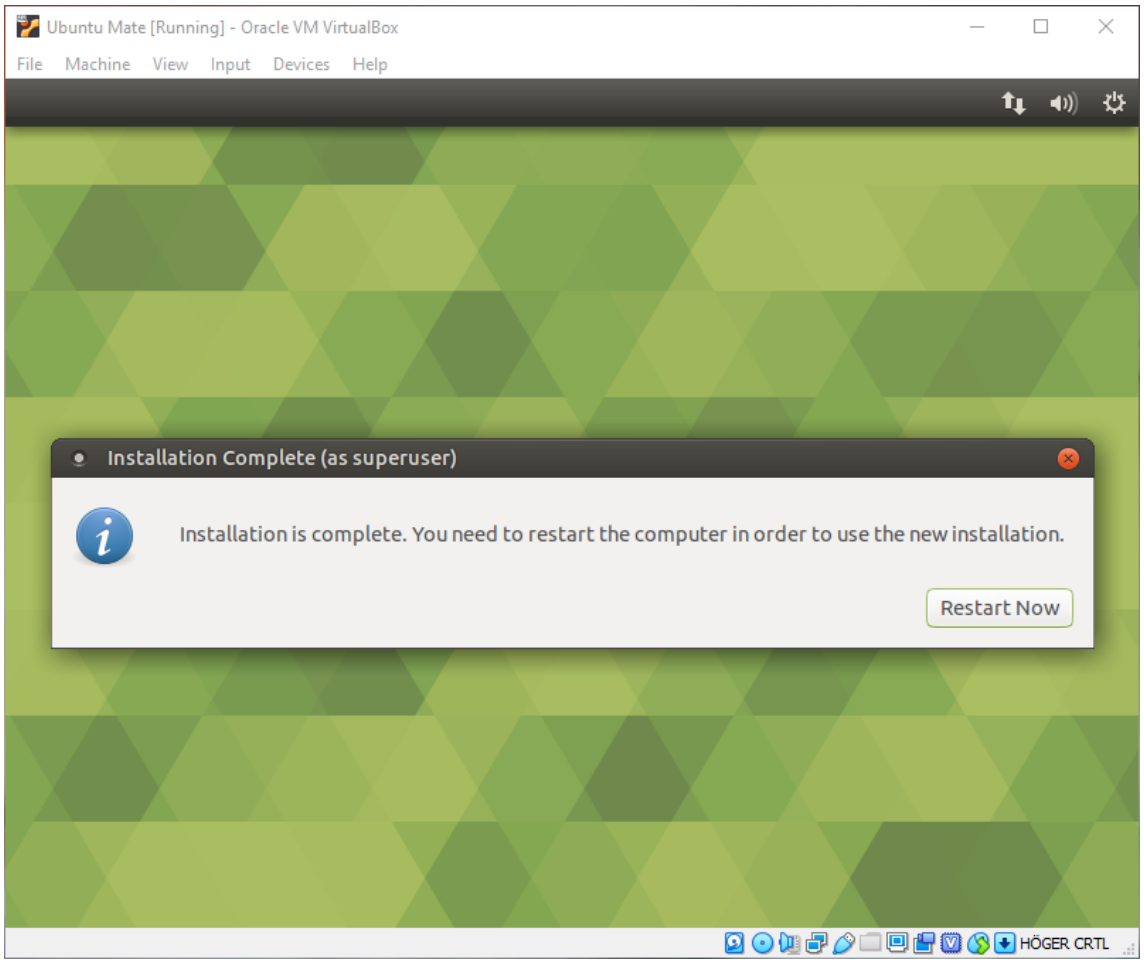


Now the installation will start in the background. Choose your timezone (*Stockholm* if you are in Sweden). Click *Continue*:

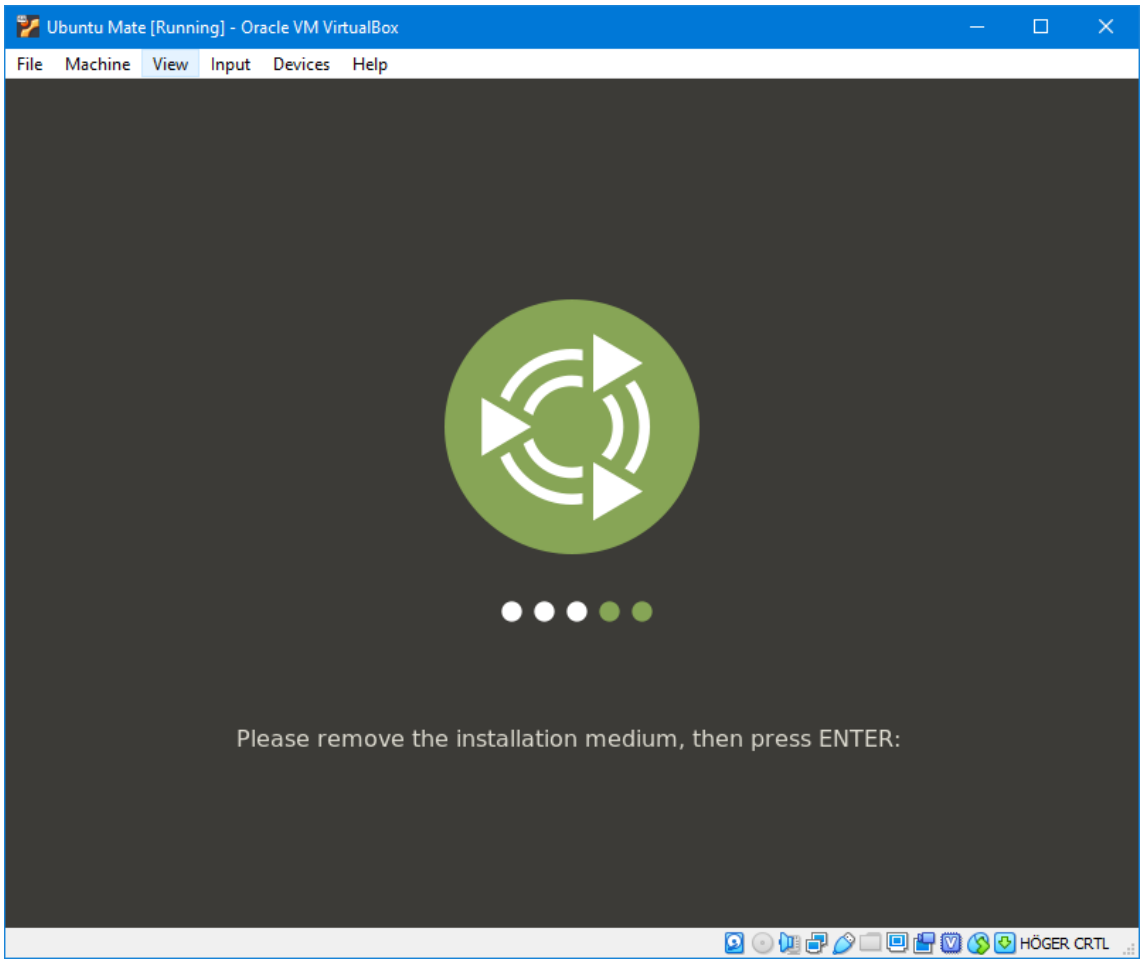


Fill in your name (first name is enough). The computer name and the user name is picked automatically. It is okay to change these if you want to, but it is not necessary. Enter a password for the machine. Remember this password, you will need it to install software later!

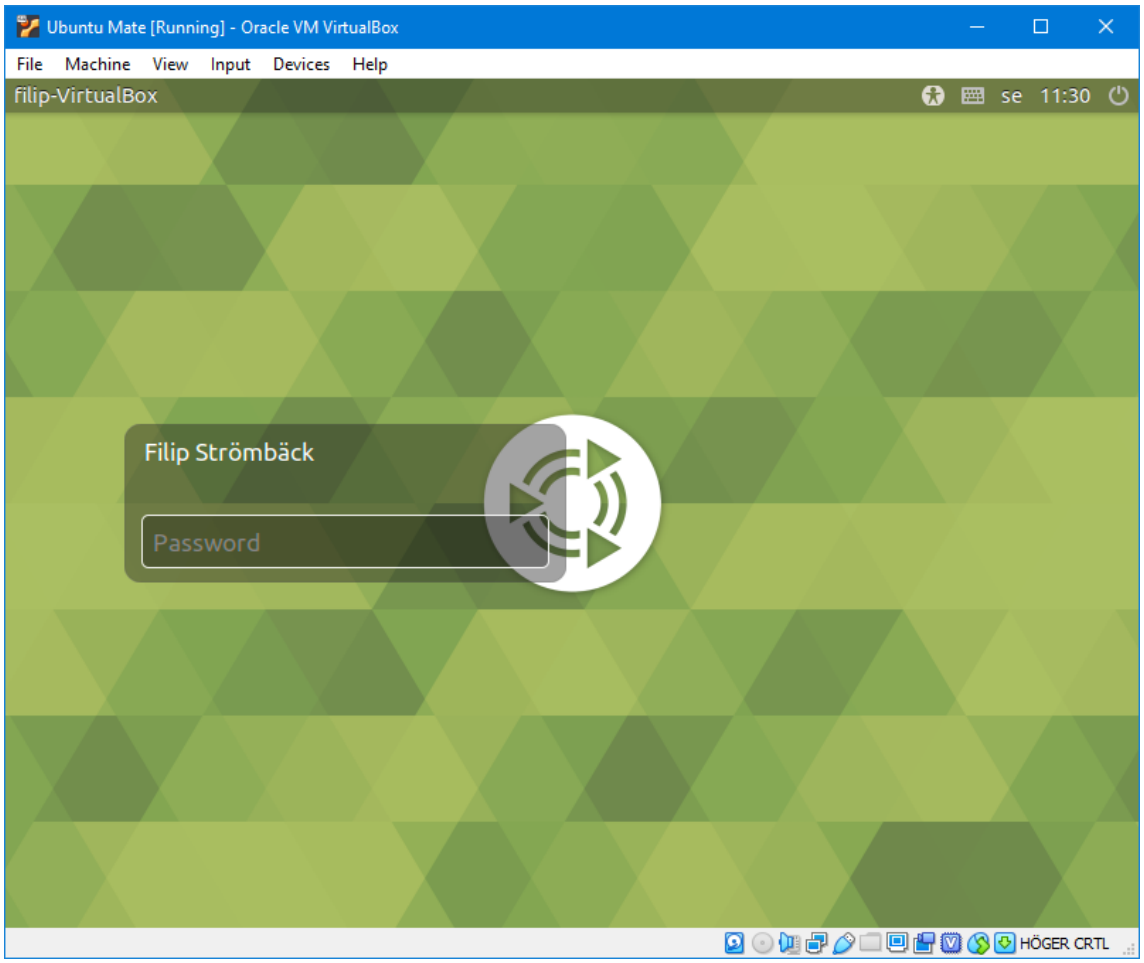
The installation continues. It takes a few minutes. When it is done you will see the following message:



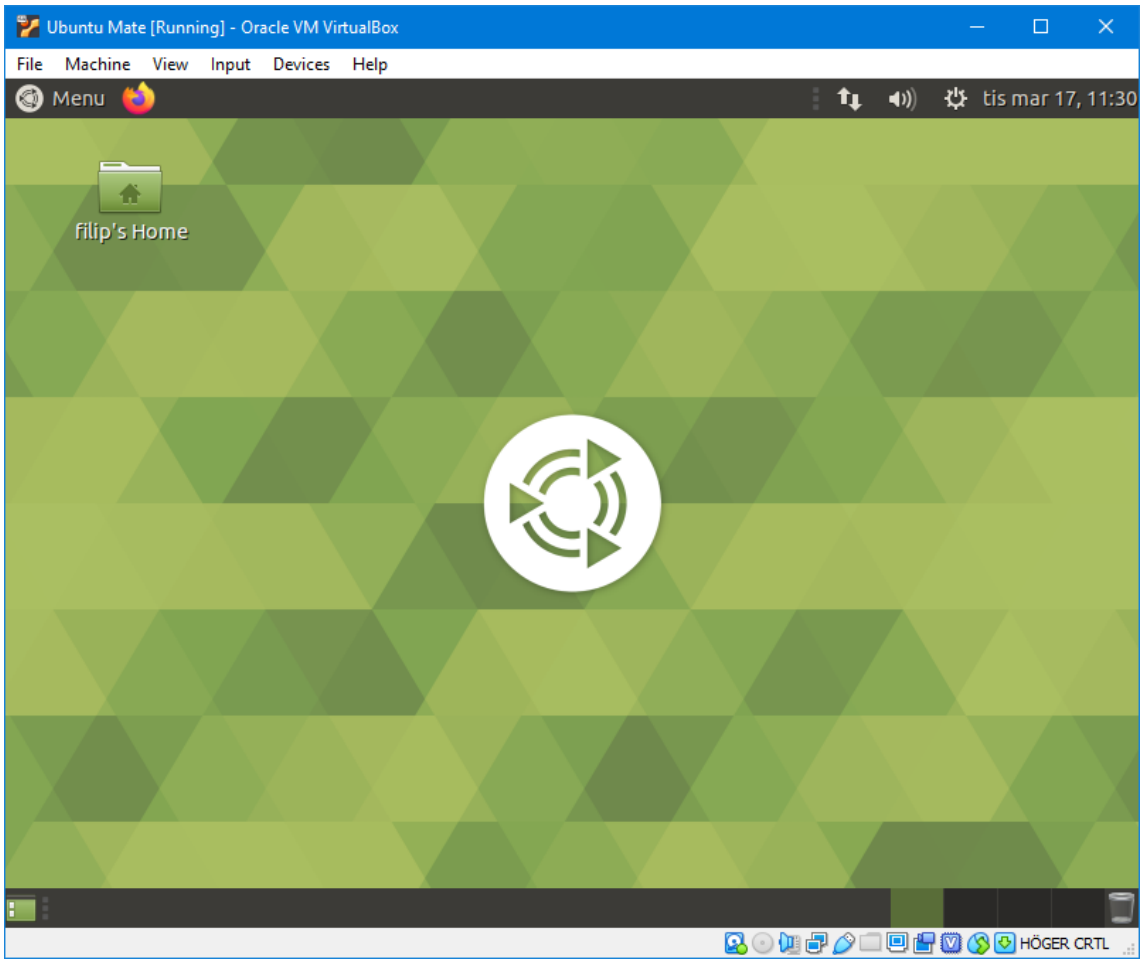
Click *Restart Now*:



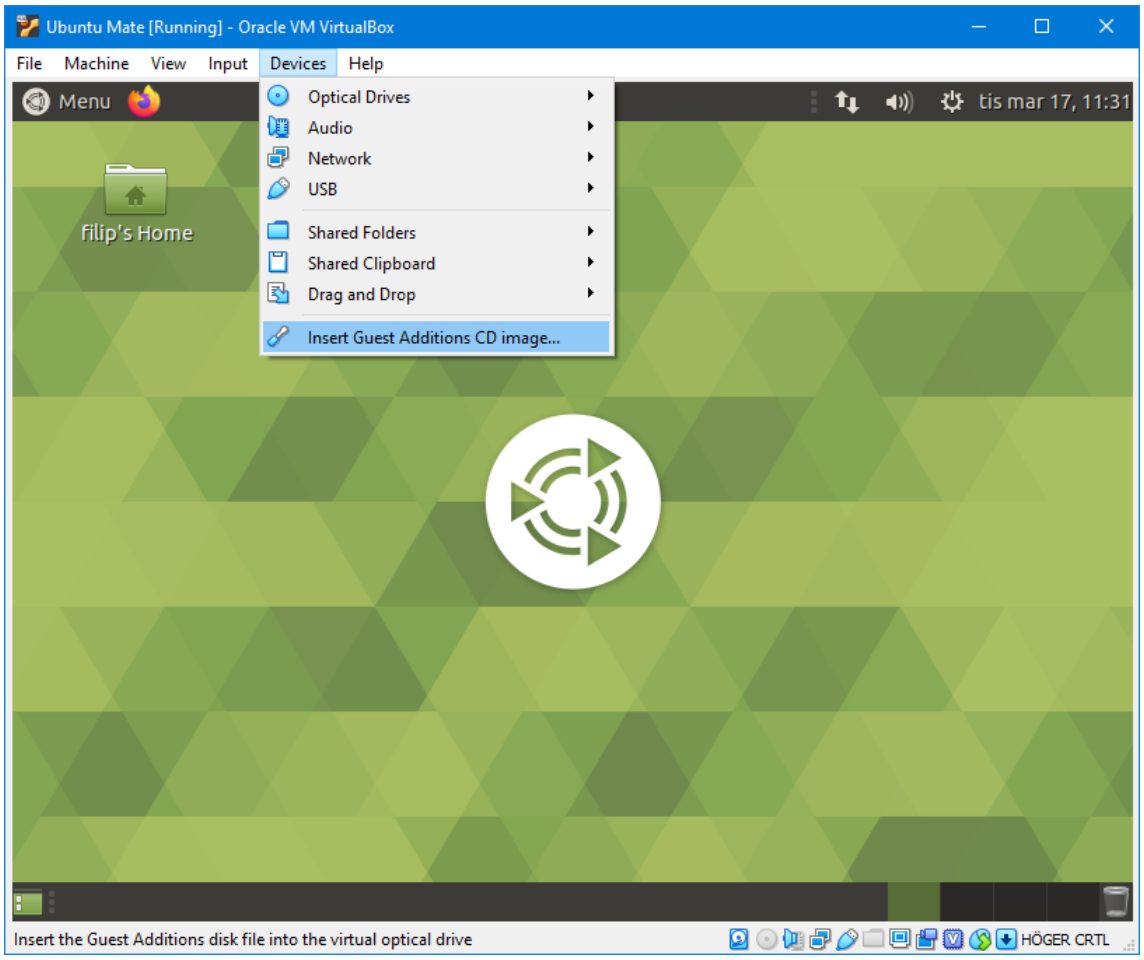
Press *Enter* when you see this message (the installation medium has been removed automatically already):



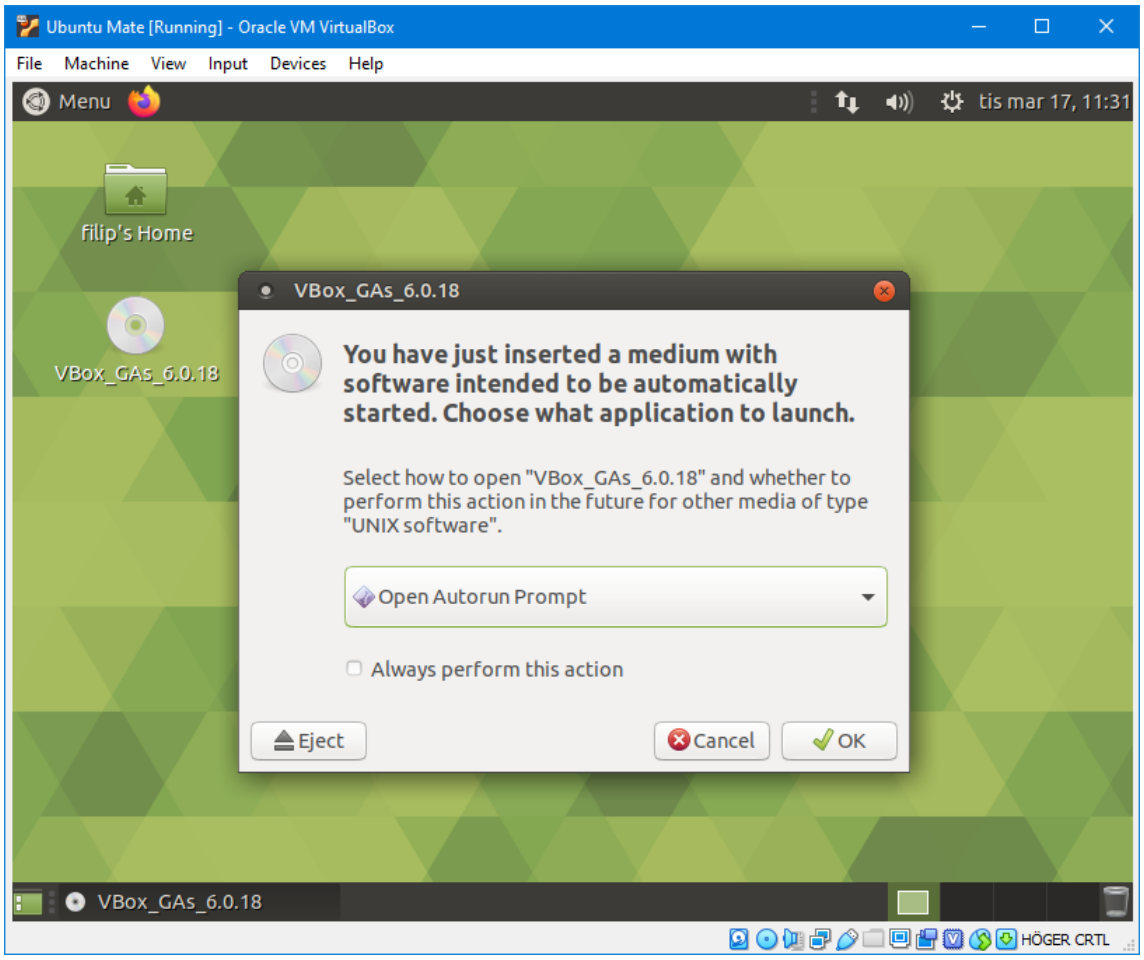
After a while it will be booted again and then you will see a login screen similar to the one in the computer labs. Log in with the password you set during installation:



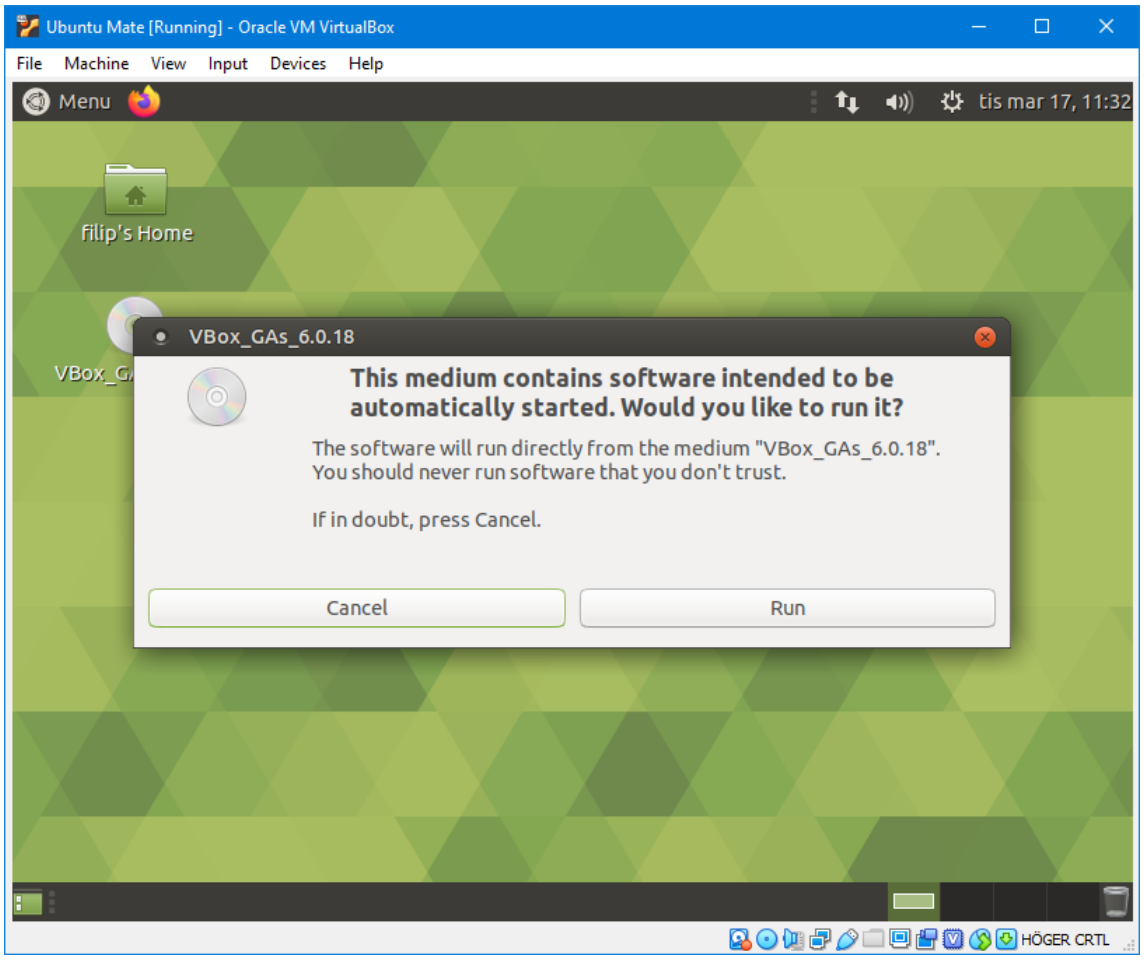
Now you will see your Linux-desktop. Now we will install som extra software that makes it easier to work on the virtual machine. For example: we want to be able to change the size of the window normally, copy and paste between the virtual machine and other programs on your computer.



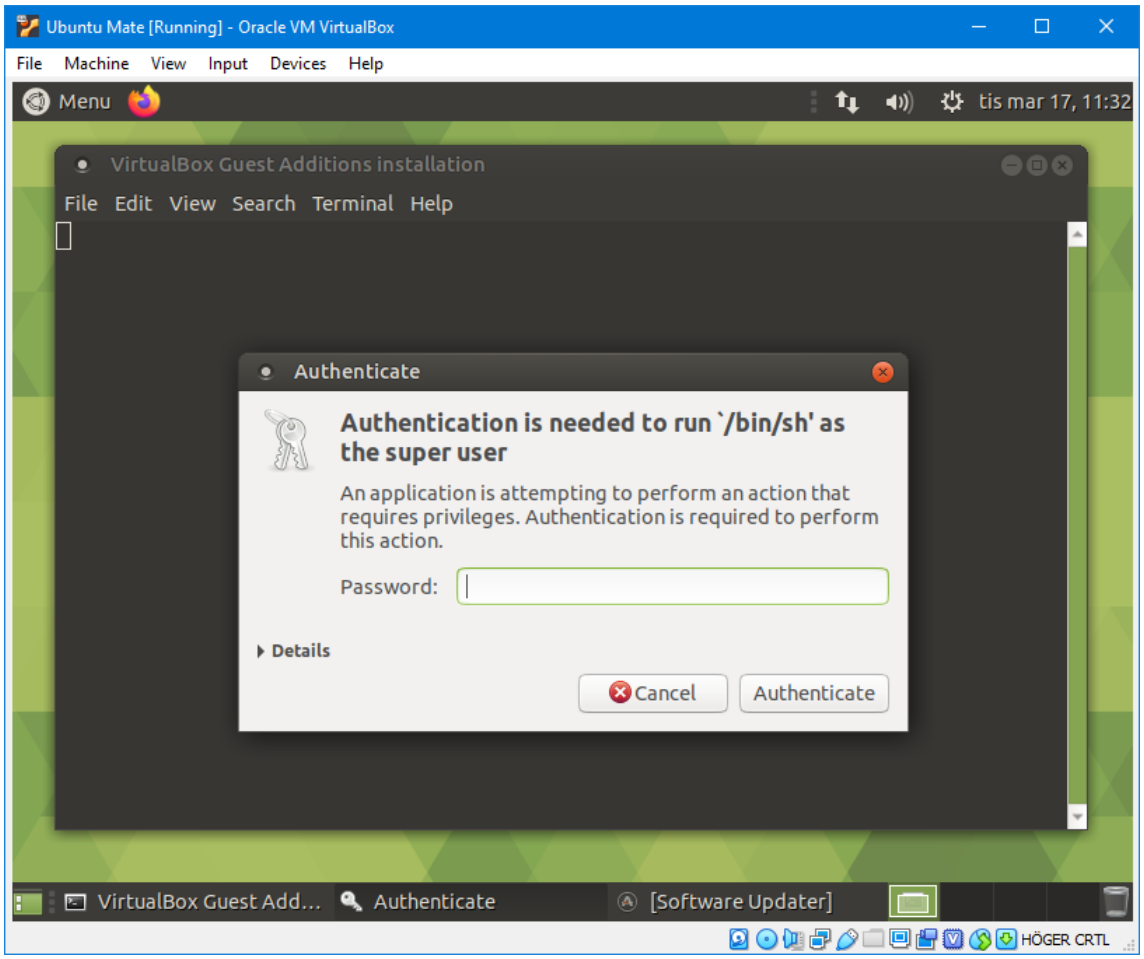
Choose *Devices* →*Insert Guest Additions CD image...*



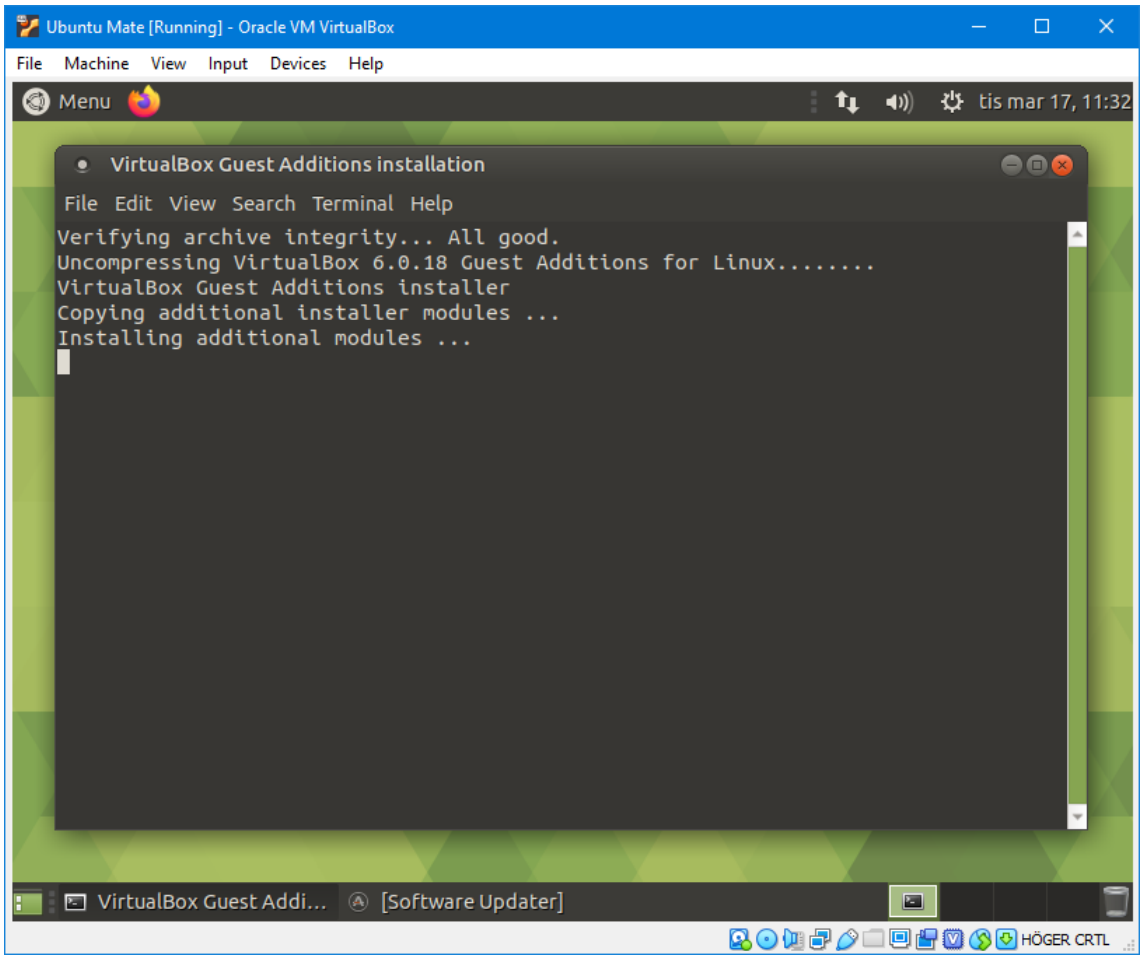
Make sure that *Open Autorun Promt* is checked, and the click *OK*:


Ubuntu Mate [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Menu
tis mar 17, 11:32
filip's Home
VBox_GAs_6.0.18
This medium contains software intended to be automatically started. Would you like to run it?
The software will run directly from the medium "VBox_GAs_6.0.18".
You should never run software that you don't trust.
If in doubt, press Cancel.
Cancel
Run
HÖGER CRTL

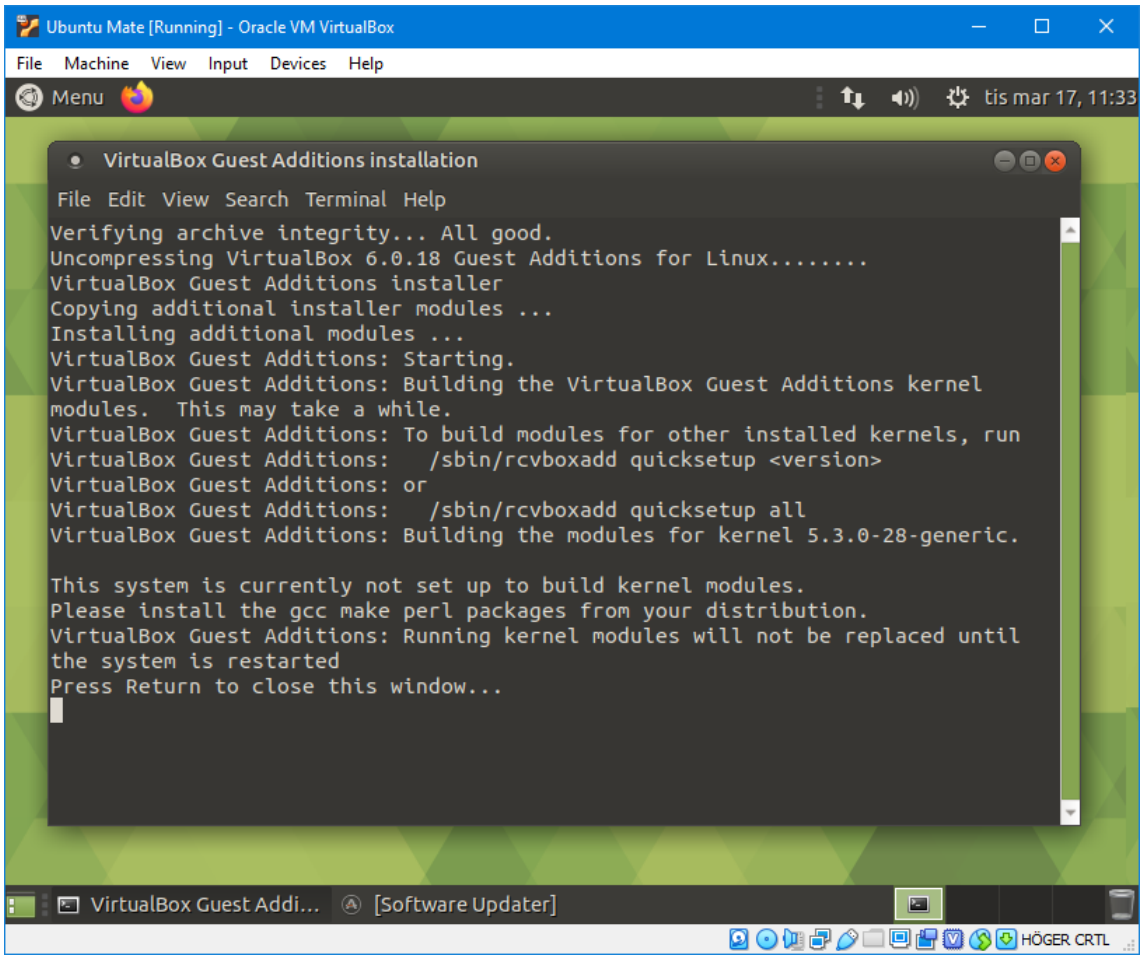
Click *Run*:



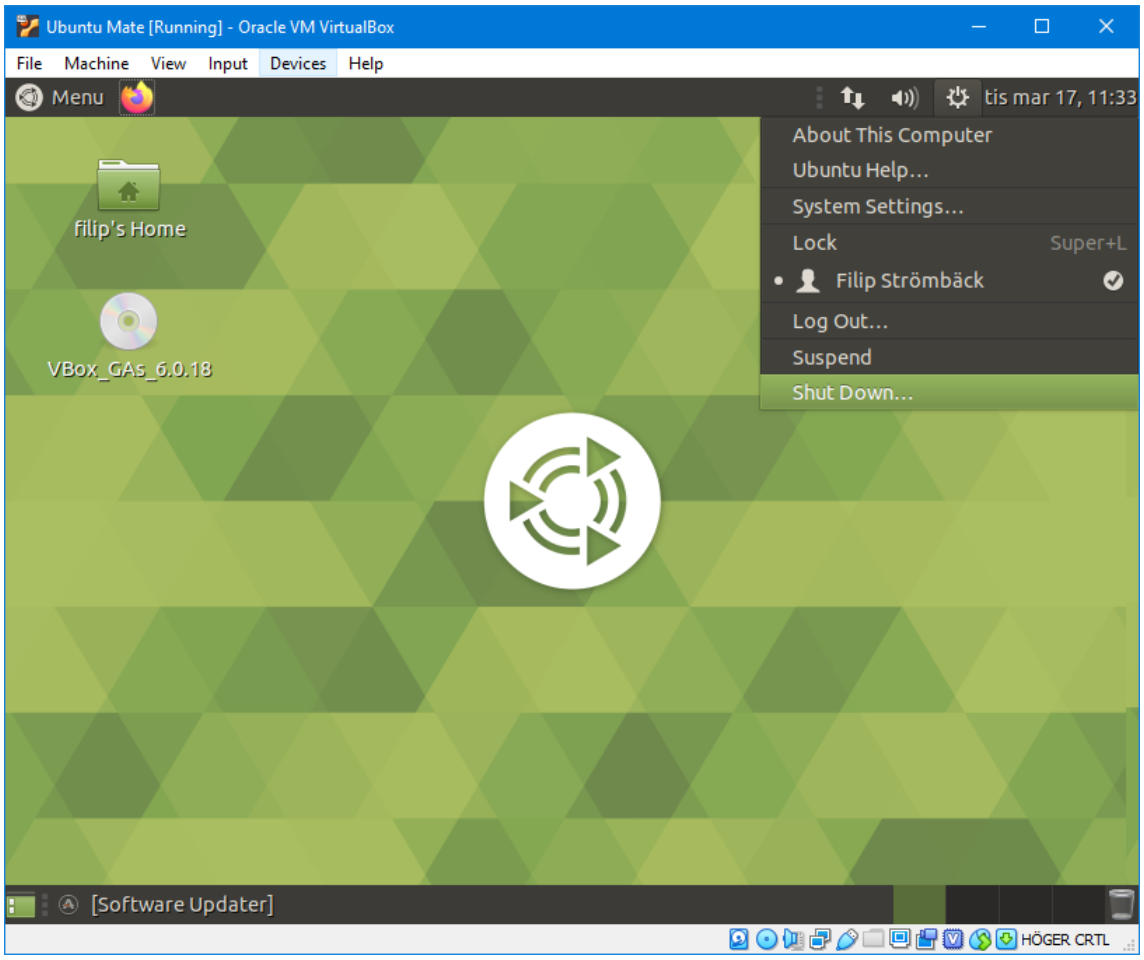
Things will be installed and you have verify this. Enter the password you set during installation again:



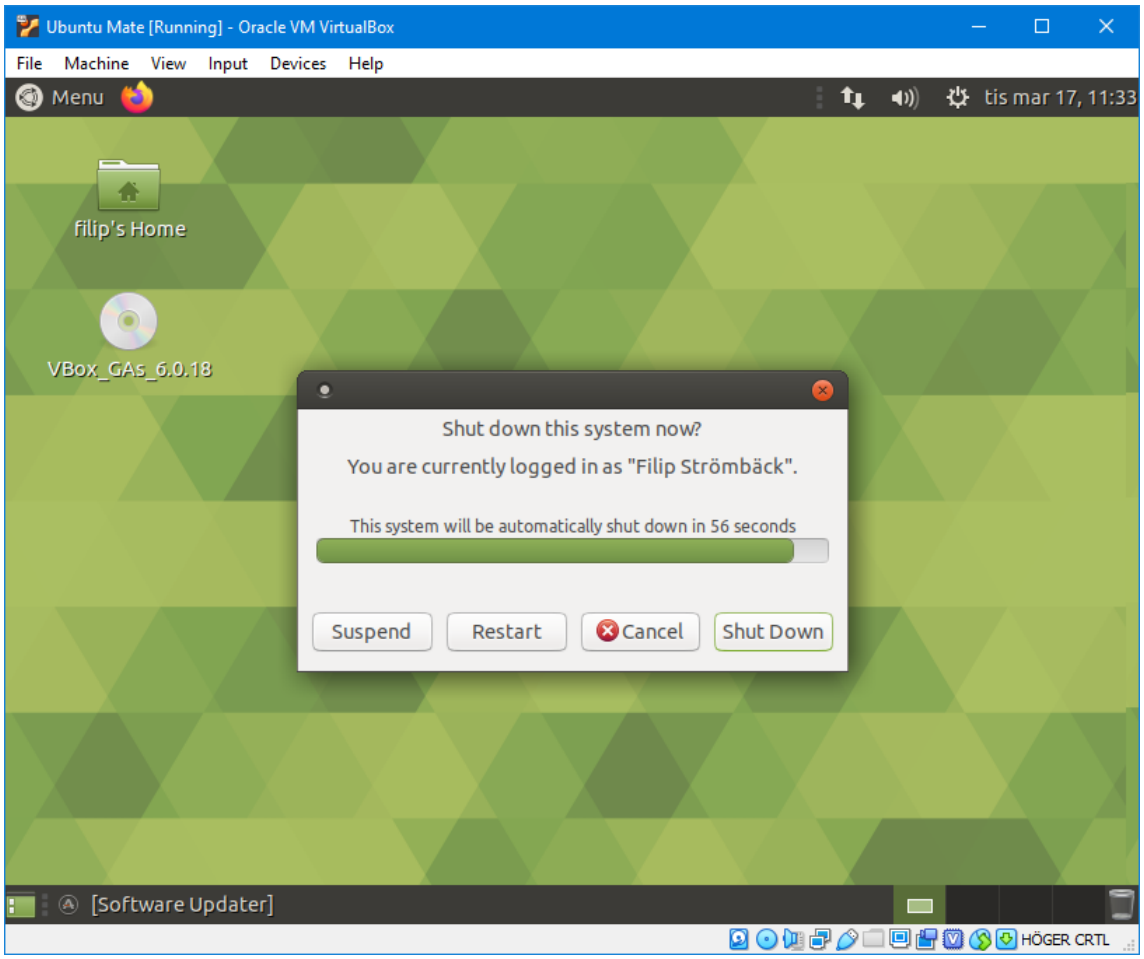
The installation will take a while.



When it is done you press *Enter* to close the window.



Restart the virtual machine by clicking the icon in the upper right corner and then *Shut Down...* as in the image.



Click *Restart*, wait until the virtual machine has restarted and log in again. Now you are ready to install programs. Open a terminal by pressing *Ctrl* + *Alt* + *T*. Run the command `sudo apt-get install g++ gdb valgrind`

This command might ask if you are sure. Press *Enter* to confirm. The installation should continue without any issues. Now you have everything you need to program C++ on your virtual machine!

You might want to install your favorite editor as well. You can install emacs with the command `sudo apt-get install emacs`, many other tools can be installed in a similar way, but that depends on whether or not that tool is included in Ubuntu.