Evolutionary Computing COMP 5660-001/6660-001/6666-V01 – Auburn University Fall 2021 – Python Environment Setup Guide

Daniel Tauritz, Ph.D.

August 16, 2021

1 Overview

The recommended development environment setup for this course is detailed in the sections below. Students will need to choose to use either Windows Subsystem for Linux (WSL) or create a virtual machine using VirtualBox. Both options will result in a good experience and it is up to the student to pick which method they prefer. In either case, a Ubuntu 20.04 environment will be created and Anaconda will be setup to provide python package management.

2 Virtualization Tech Setup

Follow either Windows Subsystem for Linux or VirtualBox setup guides in this section.

2.1 Windows Subsystem for Linux (WSL)

For more information on setting up WSL, please read the official installation documentation from Microsoft: https://docs.microsoft.com/en-us/windows/wsl/install-win10.

After setting up WSL, please skip to Section 3: Anaconda Setup

2.2 VirtualBox

First, download the Ubuntu 20.04 Desktop installation image: https://ubuntu.com/download/desktop

Visit the following page to download the VirtualBox installer that is appropriate for the target machine: https://www.virtualbox.org/wiki/Downloads

Once VirtualBox is installed, a new virtual machine instance must be crated. After launching VirtualBox, click the "New" button.

🗿 Oracle VM VirtualBox Manager			-		×
ile Machine Help					
Tools	New S ttings Discard Start				
Ese 14.7_VIRTUAL_AP_	Eccentral Name: ISE_14-7_VIRTUAL_APPLIAN CE Operating System: ISE Basel Sterrory: ISE Vistoria Basel Sterrory: ISE Vistoria Basel Sterrory: ISE Vistoria Non: ISE Vistoria Basel Sterrory: ISE Vistoria INC, INM Paravitualization ISE Vistoria	Preview			
	Display Display Graphics Controller: VBoxVGA Remote Desktop Server: Disabled Recording: Disabled				
	Storage Controller: IDE IDE Secondary Device 0: [Optical Drive] Empty Controller: SATA Port 0: ISE_S6_VM.vmdk (Norm	al, 64.00 G8)			
	Host Driver: Windows DirectSound Controller: ICH AC97				
	Adapter 1: Intel PRO/1000 MT Desktop (Bridged Ad	lapter, Killer E2500 (Sigabit Ethern	et Contro	oller)

Use the following dialog to select an appropriate name and storage location for the new vitual machine. Use this dialog to select Linux Ubuntu (64-bit) as the Type and Version as shown here.

					?	×
Create Virtual	Machin	e				
Name and c	perati	ng syste	m			
Please choose a machine and sel The name you d machine.	descript ect the t hoose wi	ive name an ype of opera II be used th	d destina ating syst roughout	ation folder f tem you inte t VirtualBox	for the new end to instal to identify t	virtual I on it. his
Name:						
Machine Folder:	<reset< td=""><td>to default></td><td></td><td></td><td></td><td>`</td></reset<>	to default>				`
Type:	Linux				•	⁶⁴ €
Version:	Ubuntu	(64-bit)			•	-
		Expert	Mode	Next	Car	ncel

Next, set the amount of RAM that will be allocated to the virtual machine. A minimum of 1 GB is recommended. However, if the target machine has enough RAM to allow for a higher setting, 2-4 GB can allow the virtual machine to be more effective. This setting can also be changed after setup at any time as long as the virtual machine is powered down.

		?	×
← Create Virtual Machine			
Memory size			
Select the amount of memory virtual machine.	/ (RAM) in megabytes to be allo	cated to	the
The recommended memory si	ze is 1024 MB.		
		2048	➡ MB
4 MB	16384 MB		
	Next	Ca	ncel

The next step will be to create a new virtual hard disk.

	?	×
← Create Virtual Machine		
Hard disk		
If you wish you can add a virtual hard disk to the new r either create a new hard disk file or select one from the location using the folder icon.	machine. You list or from a	can nother
If you need a more complex storage set-up you can ski the changes to the machine settings once the machine	p this step an is created.	d make
The recommended size of the hard disk is 10.00 GB.		
O Do not add a virtual hard disk		
Oreate a virtual hard disk now		
O Use an existing virtual hard disk file		
ISE_S6_VM.vmdk (Normal, 64.00 GB)		-
Create	e Ca	ncel

Use the default setting of VDI (VirtualBox Disk Image)

			?	×
Create Virtual Hard Disk				
Hard disk file type				
Please choose the type of file the hard disk. If you do not need to can leave this setting unchange	nat you would lik use it with othe	e to use for the r or virtualization so	new virtu oftware y	ual you
VDI (VirtualBox Disk Image)				
O VHD (Virtual Hard Disk)				
O VMDK (Virtual Machine Disk)				
	Expert Mode	Next	Can	icel

Next, select how storage will be allocated on the physical disk. It is recommended to use the default option of Dynamic allocation, but if a fixed size is desired that option can be selected as well.

÷	Create Virtual Hard Disk	
	Storage on physical hard disk	
	Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).	
	A dynamically allocated hard disk file will only use space on your physical hard disk as it fills up (up to a maximum fixed size), although it will not shrink again automatically when space on it is freed.	
	A fixed size hard disk file may take longer to create on some systems but is often faster to use.	
	Dynamically allocated	
	○ <u>Fi</u> xed size	
	Next Cancel]

? ×

Select the desired location and size for the virtual hard disk. If a dynamic allocation method was selected in the previous step, this setting will be used to limit the maximum size of the virtual drive (allocation will take place as needed up to the selected size). If a fixed size was selected, the size entered here will be immediately reserved on the physical drive. The minimum recommended size is 20 GB.

File location and size				
Please type the name of the ne on the folder icon to select a dif	w virtual hard disk file in ferent folder to create t	to the box l he file in.	below (or di
Select the size of the virtual har amount of file data that a virtua	d disk in megabytes. Thi I machine will be able to	s size is the store on th	e limit o ne hard	n th dis
Select the size of the virtual har amount of file data that a virtua	d disk in megabytes. Thi I machine will be able to	s size is the store on th	e limit o ne hard 20.	n th dis
Select the size of the virtual har amount of file data that a virtua	d disk in megabytes. Th I machine will be able to	s size is the store on the DTB	e limit o ne hard 20.	n th disk
Select the size of the virtual har amount of file data that a virtua 4.00 MB	d disk in megabytes. Th machine will be able to , , , , 2.00	s size is the store on the	e limit o ne hard 20.	n th disl

At this point the virtual machine setup will be complete. However, the Linux Ubuntu operating system must still be installed. Select the new virtual machine and click the settings button.



Use the settings menu to select Storage from the left hand menu. Next, select the currently empty device under the IDE controller. Then, click the CD icon and click the option to choose a disk file to select a disk which will be loaded into the virtual drive. Use the file browser dialog to select the Ubuntu 20.04 Desktop image that was downloaded earlier.

	x seconds				
T 📃	General	Storage			
	System	Storage Devices	Attributes Optical Drive:	IDE Secondary Device 0	
•	Storage	Controller: SATA	Information	Live CD/DVD	Choose a virtual optical disk or a physical drive to use with the virtu
	Audio Network	uu 🖸 .vdi	Size: Location:	-	disk inserted into the drive with th data in the file or on the disk in th physical drive as its contents.
	Serial Ports		Attached to:	-	
	USB Shared Folders				
	User Interface				
		🖕 🖓 🛱 🖬		OK Car	cel

The Storage dialog should now show that the ubuntu image is loaded into the IDE controller's virtual disk drive. Click ok to close the settings dialog.



The virtual machine can now be powered on. Click the start button.



The virtual machine will start up and boot from the selected Ubuntu Desktop image found in the virtual disk drive. Click the Install Ubuntu button.



Select the desired keyboard layout for the virtual machine.



Use the default values for the updates and other software options



Next, instruct the installer to erase the entire disk. This will only erase the virtual disk (none of the host system files will be erased). Click the Install Now button and then select Continue from the following dialog to begin the installation process.

😰 test [Running] - Oracle VM VirtualBox	-			\times
File Machine View Input Devices Help				
Sun 16:30	Å	4 (1)	Φ	•
Install				8
Installation type				
This computer currently has no detected operating systems. What would you like to do?				
Erase disk and install Ubuntu Warning: This will delete all your programs, documents, photos, music, and any other files in all operating sys	tems.			
 Encrypt the new Ubuntu installation for security You will choose a security key in the next step. 				
 Use LVM with the new Ubuntu installation This will set up Logical Volume Management. It allows taking snapshots and easier partition resizing. 				
 Something else You can create or resize partitions yourself, or choose multiple partitions for Ubuntu. 				
Quit Back	Ins	tall I	Now	
• • • • • •				
	2010	R	ight C	tri .:

Follow the prompts to select an appropriate time zone and configure a user and password for the virtual machine's guest operating system. When the installation is complete, click the Restart Now button.



At this point, the installer will pause to give the user time to remove the installation disk. VirtualBox usually handles this automatically, but to verify the ubuntu disk has been removed, click Devices then Optical Devices and ensure there is no check mark next to the ubuntu disk image. If there is a check mark, click the disk image menu option and select force unmount. Hit the enter key to reboot the machine.



Upon rebooting, the login screen with the configured user name should appear. If the ubuntu installation menu appears again, it will need to be removed manually through the settings dialog. Shutdown the machine. Using the menu select Machine then ACPI Shutdown.



Now that the machine is powered off, use the VirtualBox settings menu to remove the ubuntu installation disk image.

🗿 Oracle	VM Vir	tualBox Manager			- C	×
<u>File M</u> a	🛞 te	st - Settings			? ×	
		General	Storage			
50 1		System	Storage Devices	Attributes Optical Drive:	IDE Secondary Device 0	
		Display Storage	ubuntu-18.04.5-desktop-amd6 Controller: SATA	Information	Live CD/DVD	Choose/Create a Virtual Optical Disk Choose a disk file
		Audio Network	🦦 🧕 .vdi	Size: Location:	2.04 GB D: Wate \Downloads \ubuntu-18	ubuntu-18.04.5-desktop-amd64.iso Remove Disk from Virtual Drive
		Serial Ports USB		Audica to.		
		Shared Folders				
		User Interface				
					OK Cancel	
	-		Adapter 1: Intel MKO/1000 MT1	Jesktop (NRT)		

Now that the disk has been removed, close the settings dialog and start the virtual machine again.

3 Anaconda Setup

Use the following terminal commands to download and install Anaconda :

```
wget https://repo.anaconda.com/archive/Anaconda3-2021.05-Linux-x86_64.sh
chmod 755 ./Anaconda3-2021.05-Linux-x86_64.sh
./Anaconda3-2021.05-Linux-x86_64.sh
```

4 GitHub Setup

Now we're going to walk through the process of setting up your repository and submitting your assignment. First, sign into your github account (or create a new one). Make sure you have verified your email address. Then, follow this link https://classroom.github.com/a/01hmpkb7 and wait a few seconds until the repository is set up (you need to refresh the page). Follow the instructions in README.md to complete your first assignment. The assignment is due Monday August 23rd at 10:00 PM.