SimCenter Bootcamp 2019
Setting up the Virtual Machine

We are using a virtual machine (VirtualBox) for providing all necessary software. All participants need to install the respective framework and download the virtual machine to their computer.

You can obtain the VirtualBox 6.0.10 platform at:

- Windows: https://www.virtualbox.org/wiki/Downloads
- MacOS: https://www.virtualbox.org/wiki/Downloads
- Linux Distributions: https://www.virtualbox.org/wiki/Linux_Downloads

The virtual machine for the bootcamp can be downloaded from:

Username: **student**
Password: **bootcamp2019**

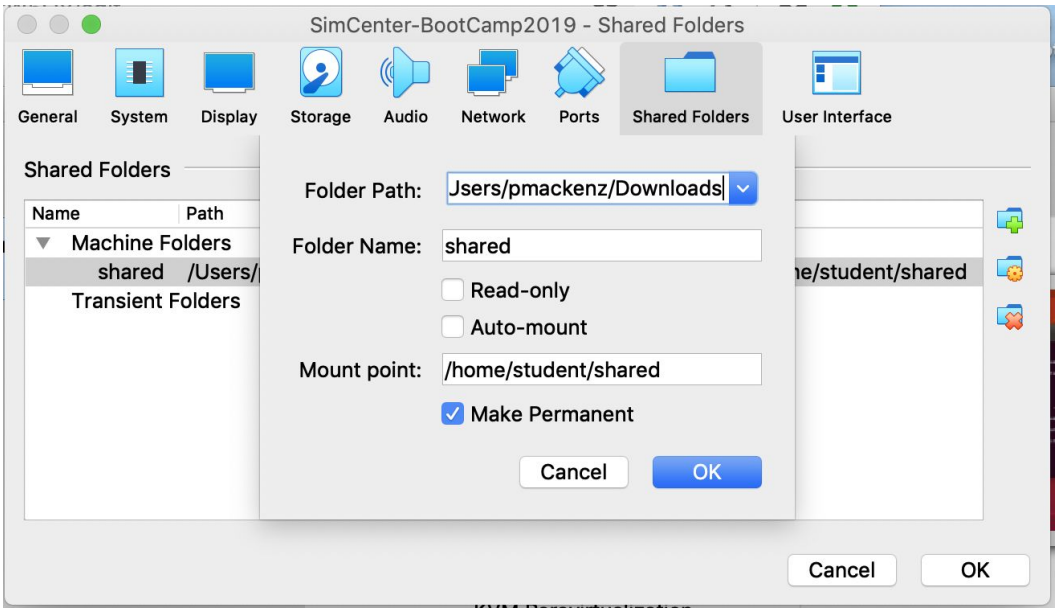
Display settings:

- MacBook Pro 15" (tested)
  - Before boot: Settings->Display->Scale Factor->**200%**
  - Inside VM: Settings->Devices->Display->Resolution->**1680x1050**
- Macbook Pro 13" (untested)
  - Before boot: Settings->Display->Scale Factor->**175%**
  - Inside VM: Settings->Devices->Display->Resolution->**1680x1050**
- PC (untested)
  - Before boot: Settings->Display->Scale Factor->**100%**
  - Inside VM: Settings->Devices->Display->Resolution->"make sure to see settings in upper right corner"

In addition to the default UBUNTU installation, the following packages were installed:

- Accessing shared folders
  - $ sudo apt install virtualbox-guest-utils
  - $ sudo apt install virtualbox-guest-dkms
  - $ sudo apt install autofs

- VirtualBox machine settings: **SELECT YOUR LOCAL SHARED FOLDER !**



  - $ mkdir /home/student/shared
  - Add line to /etc/fstab:
    - shared /home/student/shared vboxsf defaults 0 2
  - Reboot ;)
  - ISSUE: mount is RO (on MacOS)
  - ISSUE: makes VM non-portable !!
- Developer tools/compilers
  - $ sudo apt install cmake
  - $ sudo apt install git
  - GitKraken
  - $ sudo apt install gcc
  - $ sudo apt install g++
  - $ sudo apt install gfortran
  - $ sudo apt install gdb
  - $ sudo apt install qtcreator
  - $ sudo apt install openmpi-common openmpi-bin openmpi-doc
  - $ sudo apt install libopenmpi2 libopenmpi-dev
- Editors
  - $ sudo apt install emacs
  - $ sudo apt install vim (was installed)
  - gedit (was installed)
  - VS code (from https://code.visualstudio.com/download)
    - Start the application and open a .c, a .cpp, and a .py file to trigger installation of respective extensions; accept installation of missing packages
  - PyCharm CE

        - Unpack; place in /usr/local/share
        - Create link to charm in /usr/local/bin
        - Start up and make sure it connect to python3
- Python3 extensions:
    - $ sudo apt install python3-numpy
    - $ sudo apt install python3-scipy
    - $ sudo apt install python3-matplotlib
    - $ sudo apt install python3-pip3
    - $ sudo apt install pylint
    - $ sudo pip3 install mayavi
        - DO NOT USE $ sudo apt install mayavi2 for it installs a ton NUT all for python2.7
- Other
    - Configure Chromium ...
    - Added bookmarks to
        - SimCenter Homepage
        - Bootcamp on GitHub.com
        - C Tutorial
        - C++ Tutorial
        - Python Documentation
        - VS Code getting started page
    - Install tcl
        - $ sudo apt install tcl
        - $ sudo apt install tcl-dev
        - $ sudo apt install libtcl8.5
    - Install OpenSees
        - $ sudo apt install libblas-dev
        - $ sudo apt install liblapacke-dev
        - Clone OpenSees from github to ~/Development/OpenSees
        - Start from MAKES/Makefile.def.EC1-UBUNTU
        - Adjust HOME variable in Makefile.def
        - $ make (FAIL)
        - Use binary from Wael/Mike, place it in /usr/local/bin, add libtcl8.5. works
    - Dakota.sandia.org
        - No UBUNTU binary available … **PAIN**
        - $ sudo apt install libboost-dev libboost-all-dev
        - After continuing issues with dakota 6.10.0, I went with 6.9.0 instead
        - There is a bug in packages/external/JEGA/Utilities/src/DiscreteDesignVariableNature.cpp; Added #include <cmath> to fix compile error involving fabs()
        - Added xorg-dev libmotif-dev libglw1-mesa-dev libxm4 libxm-dev libxt6 libxt-dev libxpm4 libxpm-dev xpmutils
        - **COULD NOT GENERATE GUI -- COMMAND LINE ONLY :(**

    - QGIS
        - $ sudo apt install qgis (OK)
- From Wael: Python packages
    1. python3-selenuim (OK)
    2. Web driver for Selenuim (e.g. chrome driver)
       (**what is web driver???**)

       The webdriver is a driver for a web browser that is required for selenium to work. Download links are available in this page:

       https://selenium-python.readthedocs.io/installation.html#drivers

       On my computer I use the chrome one.

    3. GOT **chromium-chromedriver instead**
    4. Python3-bs4 (OK) (beautiful soup)
    5. python3-lxml (OK)
    6. python3-requests (OK)
    7. python3-pandas (OK)
    8. python3-geopandas (OK)
    9. Census
       $ sudo pip3 install census (OK)
    10. us
        $ sudo pip3 install us (OK)

To get started:

- Projects are located in $HOME/Development
    - MyFirstC-program (open inside Qt Creator)
    - MyFirstCPP-program (open inside Qt Creator)
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