# Installing the Virtual Machine

To make the installation process as smooth as possible, we decided to use a virtual machine. To get the environment up and running, please follow the following steps:

1. Install the free software „VirtualBox" for your operating system (Windows, Mac, Linux) following the instructions under https://www.virtualbox.org/
2. Download a suitable image to start from. We suggest using „Linux Lite 5.8", which can be downloaded under https://www.osboxes.org/linux-lite/. Then unzip the downloaded file, which should give you a *.vdi file.
3. Start VirtualBox, which should give you:
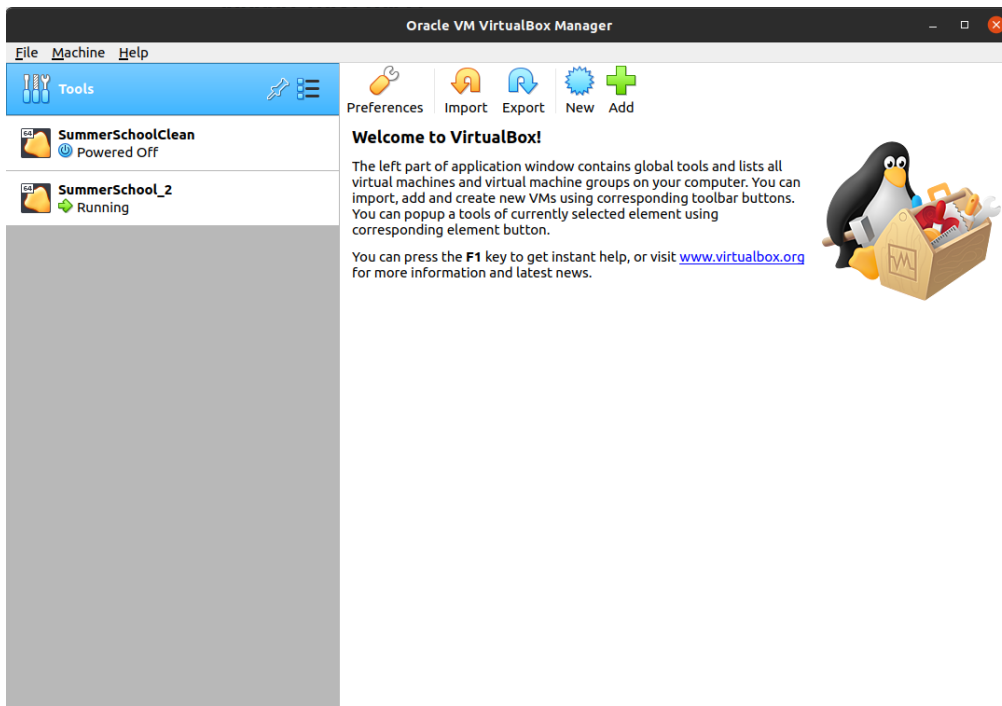
4. Press „New" to generate a new virtual machine.
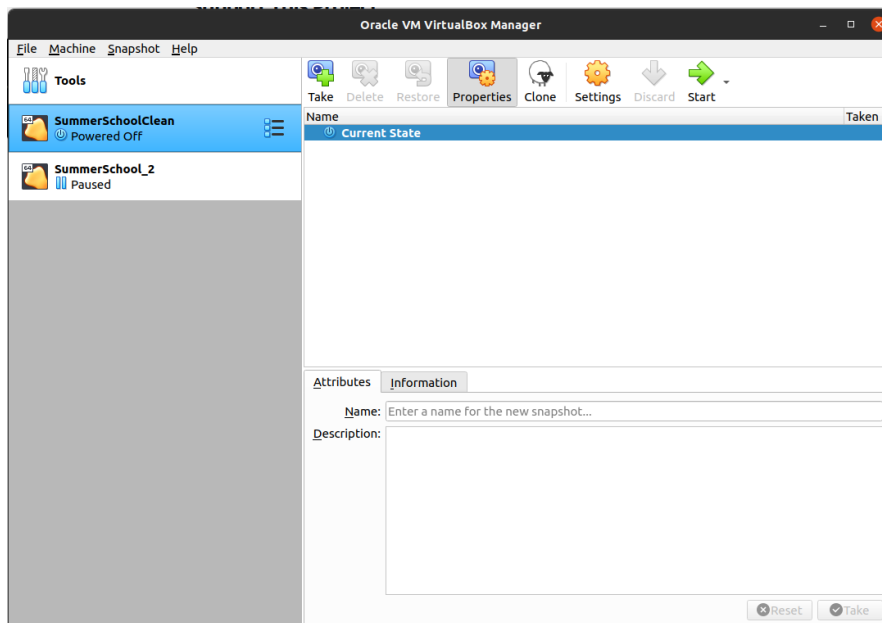5. Give the VM a name and enter the following:
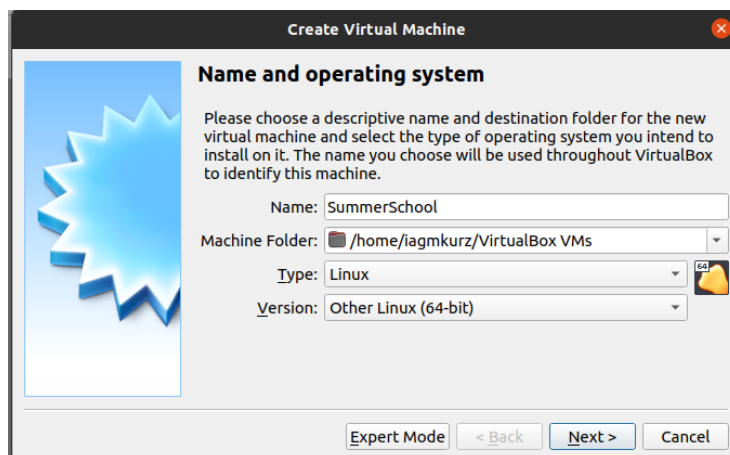
6. Press „Next"
7. Select the amount of RAM usable by the VM (we recommend at least 2GB, depending on the available resources)
8. Press „Next"

9. Select the downloaded VDI-file as hard disk as follows:
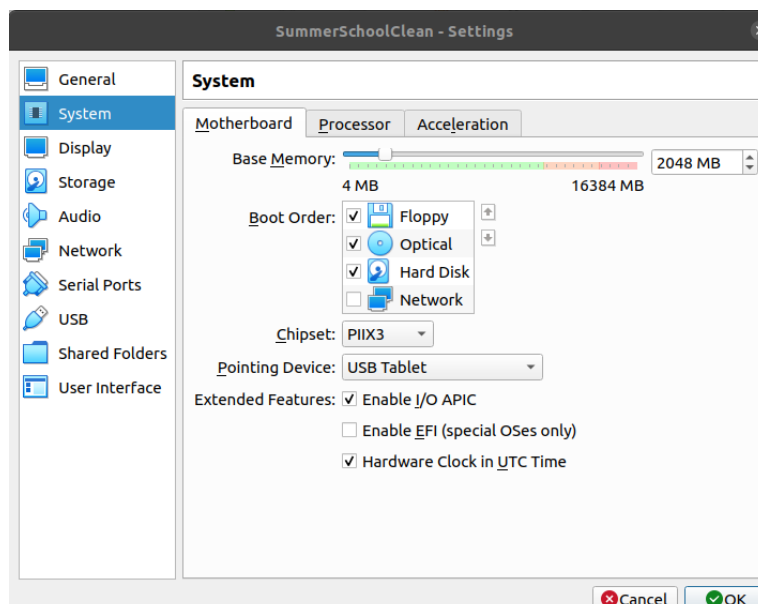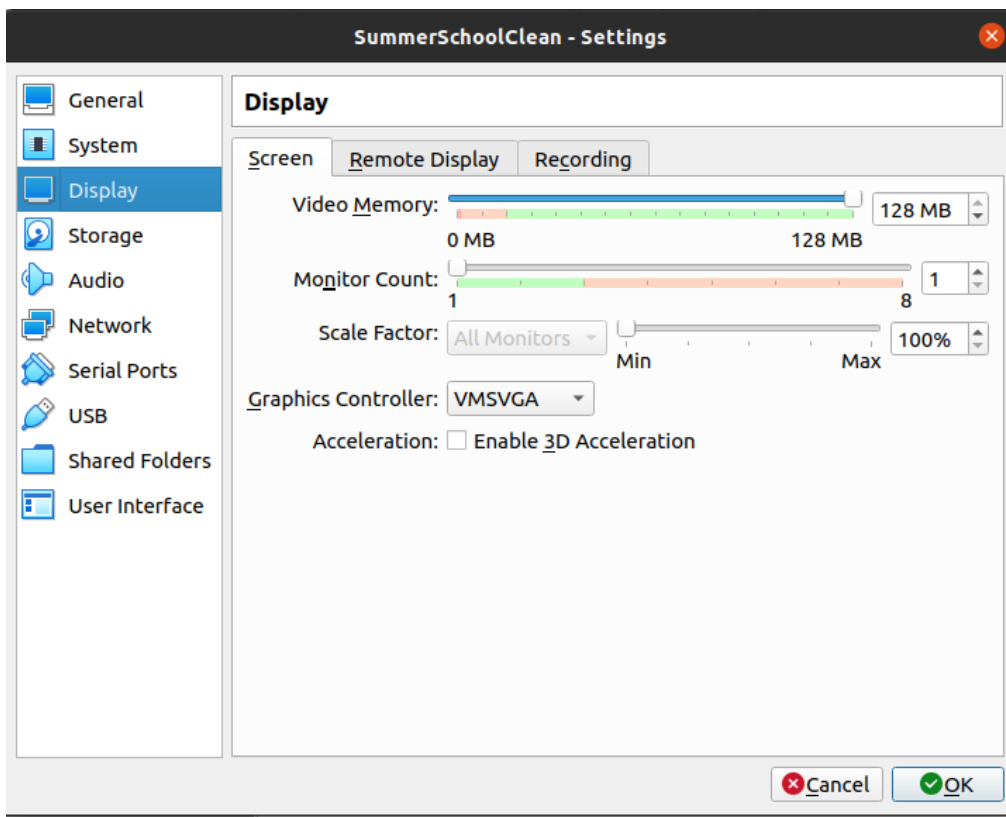

10. Press „Create"
11. Select your new virtual box by clicking on it and select „Settings":

12. You can go to „System" and adapt the amount of memory available for the VM and the number of processors under „processor":
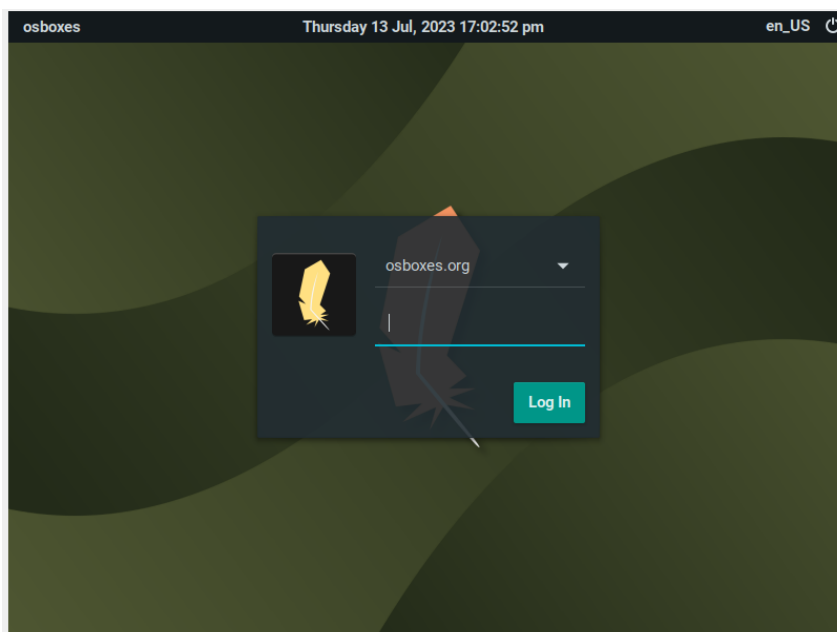
13. Lastly, got to „Display" and increase the video memory to a minimum of 64MB to make everything work well:

14. Then press „OK"
15. Start the VM by clicking on it and pressing „Start"
16. A login screen should pop up after around a minute:

17. The Password for your used and administrator/root right is always „osboxes.org" (without the quotations). Enter the password and login.

Running the Test Example

We provide a test example to install the necessary software and run a test example in the virtual box. For this, follow the next steps:

1. Open a terminal by clicking right on the Desktop and clock „Open Terminal Here"
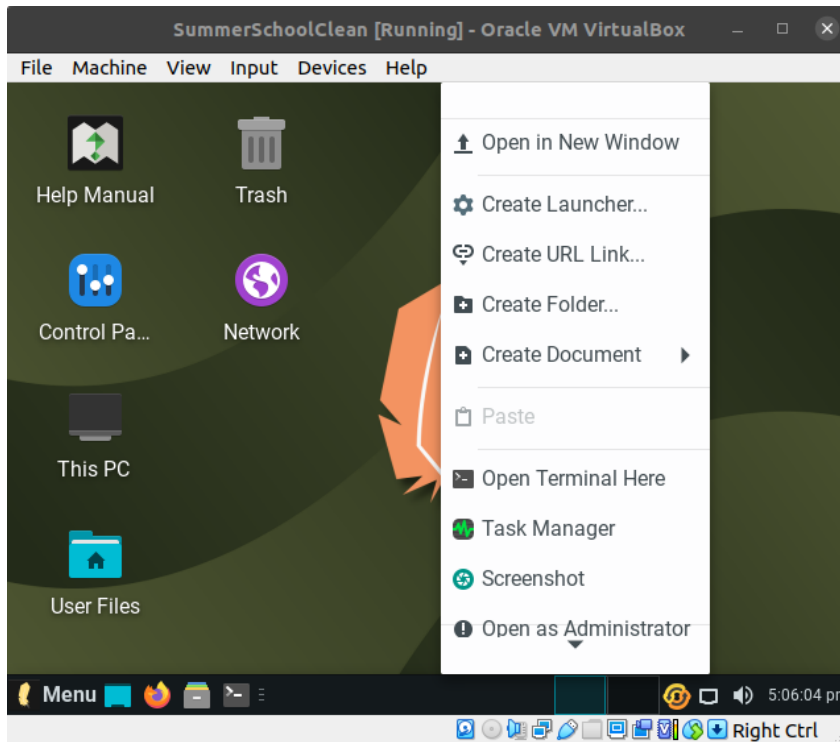
2. First select the keyboard layout you want to use. For this type the command „setxkbmap de", which would set the keyboard from the standard US layout to German. Choose „fr" or „it", depending on your liking.

3. Run the following commands after each other to install Git (you might have to type in the password „osboxes.org" again):

    1. sudo apt-get update

    2. sudo apt-get install git

4. Now, we have made all resources necessary for the session available at https://gitlab.iag.uni-stuttgart.de/cemracs_summerschool_2023/. This contains all code and data required.

5. We want to get the setup repository by typing „git clone https://gitlab.iag.uni-stuttgart.de/cemracs_summerschool_2023/setup-flowcontrol.git"

6. Then enter the folder with „cd setup-flowcontrol"

7. Execute the script „create_env.sh" by typing „bash create_env.sh"

8. Now, your environment for the hands-on session is created. This might take a while (half an hour). After finishing the installation, an example script is run. If you get output something like this, everything worked:

```
------------------------------------------------------------------
Starting SmartSim...
------------------------------------------------------------------
# Starting the Database...
# Identified 1 of 1 database hosts to later connect clients to: 127.0.0.1

# If the SmartRedis database isn't stopping properly you can use this command to stop it from the command line:
# $(smart --dbcli) -h 127.0.0.1 -p 6780 shutdown
SmartRedis Library@17-15-45:WARNING: Environment variable SR_LOG_FILE is not set. Defaulting to stdout
SmartRedis Library@17-15-45:WARNING: Environment variable SR_LOG_LEVEL is not set. Defaulting to INFO
17:15:45 osboxes SmartSim[2434] INFO Stopping model train0_flexi with job name train0_flexi-CU1CTRINW1KN
17:15:46 osboxes SmartSim[2434] INFO Stopping model eval0_flexi with job name eval0_flexi-CU1CTRVMW8YS
I0713 17:15:46.815577 140247105517376 common.py:1018] No checkpoint available at logs/Cylinder_Test_improv_single_action_16env_lr_3pm4_tanh_normal_corr_neurons/ckpt/

==================================================================
Starting Training Loop!
==================================================================
/tmp/__autograph_generated_filem2xweb3k.py:67: SyntaxWarning: "is" with a literal. Did you mean "=="?
  ag__.if_stmt(ag__.not_(ag__.or_((lambda : (ag__.ld(policy_state) is None)), (lambda : ag__.or_((lambda : (ag__.ld(policy_state) is ())), (lambda : (ag__.ld(policy_state) is [])))))), if_body_2, else_bo
/tmp/__autograph_generated_fileiwudzirb.py:74: SyntaxWarning: "is" with a literal. Did you mean "=="?
  ag__.if_stmt((ag__.ld(policy_state) is ()), if_body_2, else_body_2, get_state_2, set_state_2, ('do_return', 'retval_'), 2)
/tmp/__autograph_generated_file3_27hsdi.py:122: SyntaxWarning: "is" with a literal. Did you mean "=="?
  ag__.if_stmt((ag__.ld(new_policy_state)['actor_network_state'] is ()), if_body_5, else_body_5, get_state_5, set_state_5, ("new_policy_state['actor_network_state']",), 1)
/tmp/__autograph_generated_file3_27hsdi.py:123: SyntaxWarning: "is" with a literal. Did you mean "=="?
  ag__.if_stmt((ag__.ld(new_policy_state)['value_network_state'] is ()), if_body_6, else_body_6, get_state_6, set_state_6, ("new_policy_state['actor_network_state']", "new_policy_state['value_network_sta
/tmp/__autograph_generated_file3_27hsdi.py:124: SyntaxWarning: "is" with a literal. Did you mean "=="?
  ag__.if_stmt(ag__.and_((lambda : (ag__.ld(new_policy_state)['actor_network_state'] is ())), (lambda : (ag__.ld(new_policy_state)['value_network_state'] is ()))), if_body_7, else_body_7, get_state_7, se
actor_network_state']", "new_policy_state['value_network_state']"), 3)
/tmp/__autograph_generated_file3_27hsdi.py:124: SyntaxWarning: "is" with a literal. Did you mean "=="?
  ag__.if_stmt(ag__.and_((lambda : (ag__.ld(new_policy_state)['actor_network_state'] is ())), (lambda : (ag__.ld(new_policy_state)['value_network_state'] is ()))), if_body_7, else_body_7, get_state_7, se
actor_network_state']", "new_policy_state['value_network_state']"), 3)
/tmp/__autograph_generated_filepkqkfzp3.py:14: SyntaxWarning: "is not" with a literal. Did you mean "!="?
  retval_ = ag__.and_((lambda : (ag__.ld(state) is not None)), (lambda : ag__.and_((lambda : (ag__.ld(state) is not ())), (lambda : (ag__.ld(state) is not [])))))
17:16:53 osboxes SmartSim[2434] INFO Stopping model eval0_flexi with job name eval0_flexi-CU1CTSCDDONS

# Eval time: [66.51]s
# Eval average return: -233.297211
17:17:46 osboxes SmartSim[2434] INFO Stopping model train0_flexi with job name train0_flexi-CU1CUMWCNK5K
WARNING:tensorflow:From /home/osboxes/.local/lib/python3.8/site-packages/tensorflow/python/autograph/impl/api.py:377: ReplayBuffer.gather_all (from tf_agents.replay_buffers.replay_buffer) is deprecated a
Instructions for updating:
Use `as_dataset(..., single_deterministic_pass=True)` instead.
W0713 17:17:47.717058 140247105517376 api.py:460] From /home/osboxes/.local/lib/python3.8/site-packages/tensorflow/python/autograph/impl/api.py:377: ReplayBuffer.gather_all (from tf_agents.replay_buffers
n a future version.
Instructions for updating:
Use `as_dataset(..., single_deterministic_pass=True)` instead.

------------------------------------------------------------------
ITERATION 0
------------------------------------------------------------------
# Episodes:     1
# Env. Steps:   80
# Train Steps:  5

# Collect time: [54.06]s
# Train time:   [31.23]s
# TOTAL:        [151.83]s

# Saving checkpoint to: logs/Cylinder_Test_improv_single_action_16env_lr_3pm4_tanh_normal_corr_neurons/ckpt/
I0713 17:18:18.773951 140247105517376 common.py:1043] Saved checkpoint: logs/Cylinder_Test_improv_single_action_16env_lr_3pm4_tanh_normal_corr_neurons/ckpt/ckpt-5
17:18:18 osboxes SmartSim[2434] INFO Stopping model orchestrator_0 with job name orchestrator_0-CU1CTI7E4FXZ

==================================================================
Sucessfully finished after: [  176.07]s
==================================================================
osboxes    main   ~   setup-flowcontrol
```