# Preface

An environment must be set up to prepare the contents of the class. You can also install the python dependencies with Ubuntu and Mac by yourself. Windows-Users may will have problems with Atari-gym and Tensorboard. Moreover, commands and important hints are written in **bold**.

## Python Dependencies

- Python 3.5.5
- numpy==1.14.3
- opencv-python==3.4.0.12
- tensorflow==1.5.0
- pandas==0.22.0
- matplotlib==2.2.2
- gym==0.10.5 (for Atari installation see here)
- gym-retro==0.5.4 (.sha files in data folder of site-packages must be renamed to .md or .ai, see here for more information)

# Environment (Windows 10 Home)

This approach uses VirtualBox. You should have 15 GB free disk space. Datasets are already downloaded and eclipse is already configured.

## Step 1: Install VirtualBox

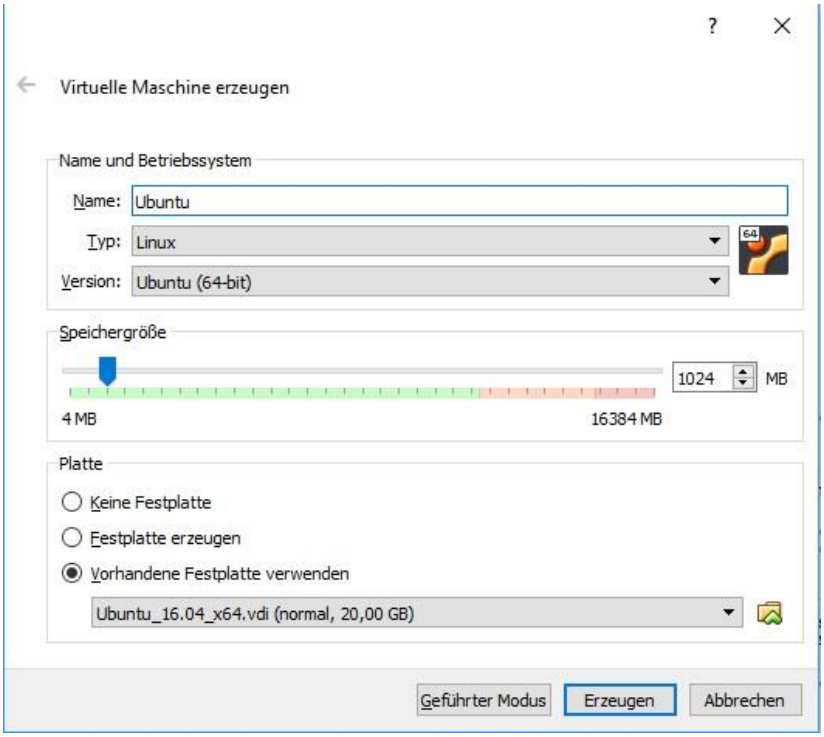
- Windows, Mac, Linux
- Ensure Hyper-V is disabled (Windows 10 Professional only)
- Ensure Hardware virtualization is enabled in the BIOS

## Step 2: Download VirtualBox-Image (.vdi file)

- Download .vdi-file from here and place it to any appropriate place

## Step 3: Import Image

- Click New-Button
- Type an appropriate name for the image
- Setup Typ Linux and Version Ubuntu (64 Bit)
- Choose Use an existing virtual hard drive file
- Click on the folder button and browse for the .vdi file which you downloaded in step 2
- Click Create

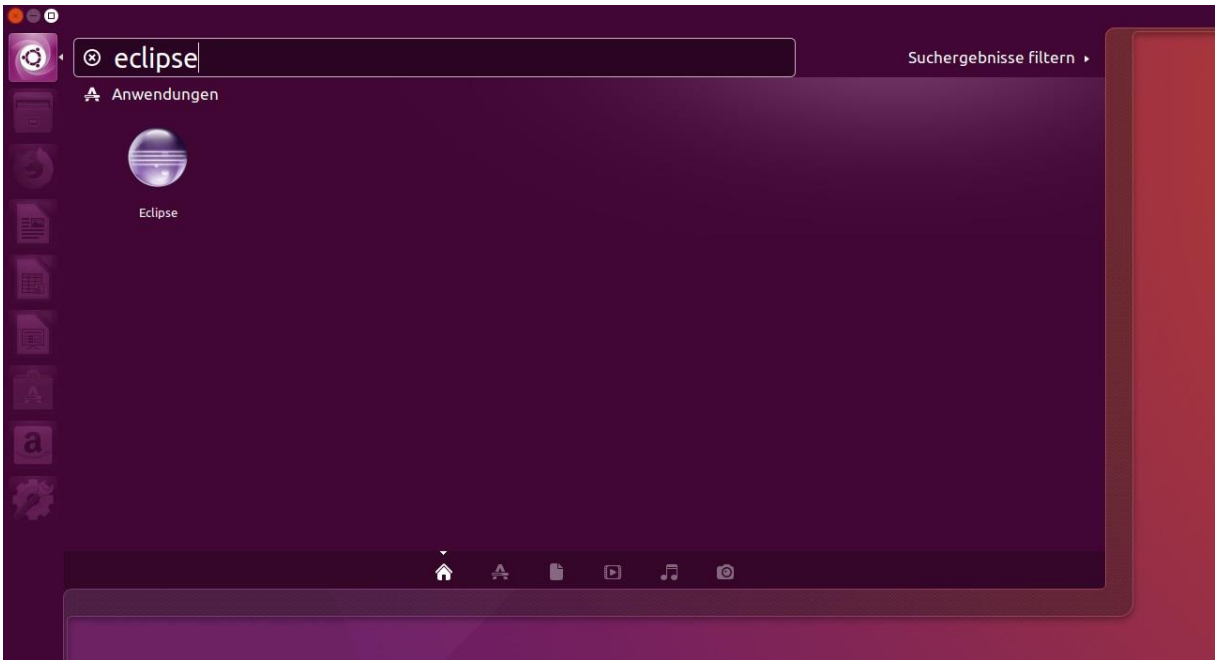



## Step 4: Start Image

- Double-Click on new created image
- Login as **modalg** with password **12345678**

## Step 5: Start eclipse

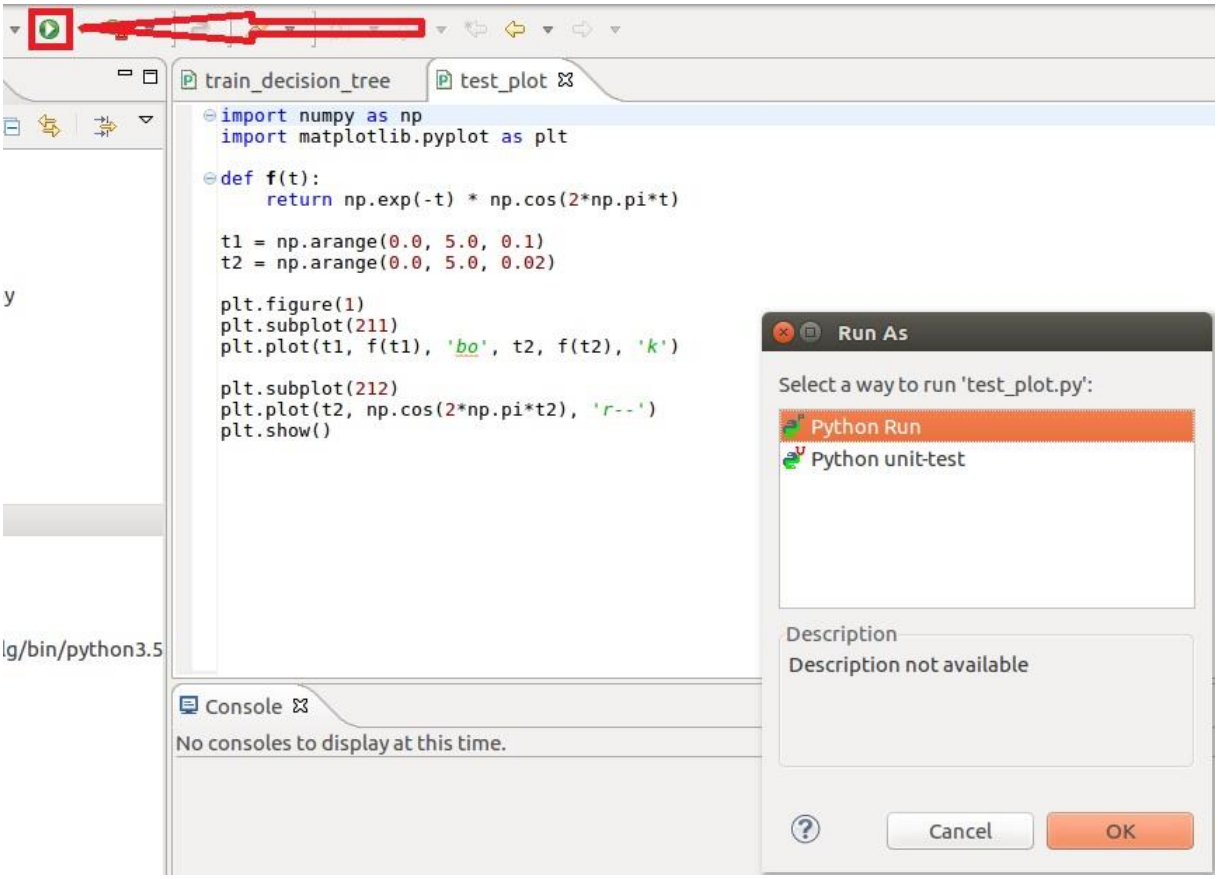
- Click on Ubuntu-Button and search for **eclipse**
- Execute eclipse
- Click ok when workspace dialog appears




## Step 6: Run Test Project

- Open **test** folder in **modalg181**-Project
- Double click on any of the files

- Execute file with click on run button (run as **Python Run**)




## Environment (Windows 10 Professional, Ubuntu, Mac)

Docker, Git and Real VNC Viewer are mainly used. You should have 8 GB free disk space.

### Step 1: Install Docker

- Windows & Mac
- Ubuntu
- Location of docker files and memory usage can be configured (Windows, Mac, Ubuntu)

### Step 2: Create Docker-Hub Account

- Sign in here

### Step 3: Pull Docker Image

- Open Command Prompt (Windows, Ubuntu, Mac)
- Type **docker login** and press enter
  - If any error occur – restart Docker!
- Type **docker pull mati3230/modalg181**

### Step 4: Check Image

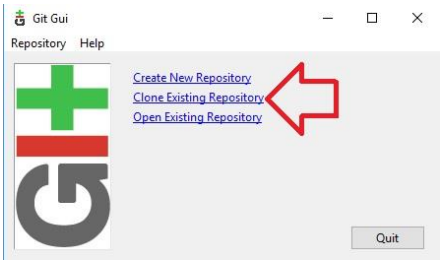
- Type **docker images**
- Type **docker run --rm -it --name test_container mati3230/modalg181 python --version**
- Output: Python 3.5.5

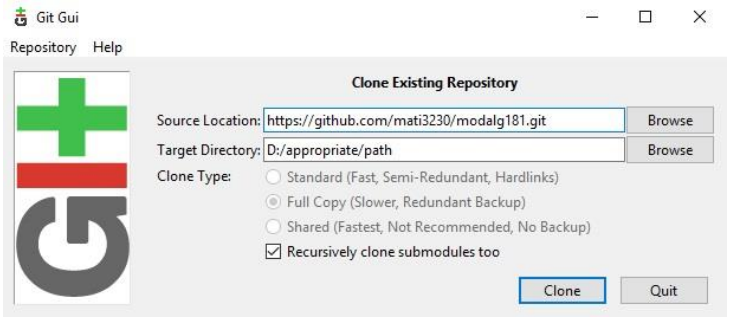
## Step 5: Install Git

- All operating systems
- More information on how to install git

## Step 6: Clone Repository

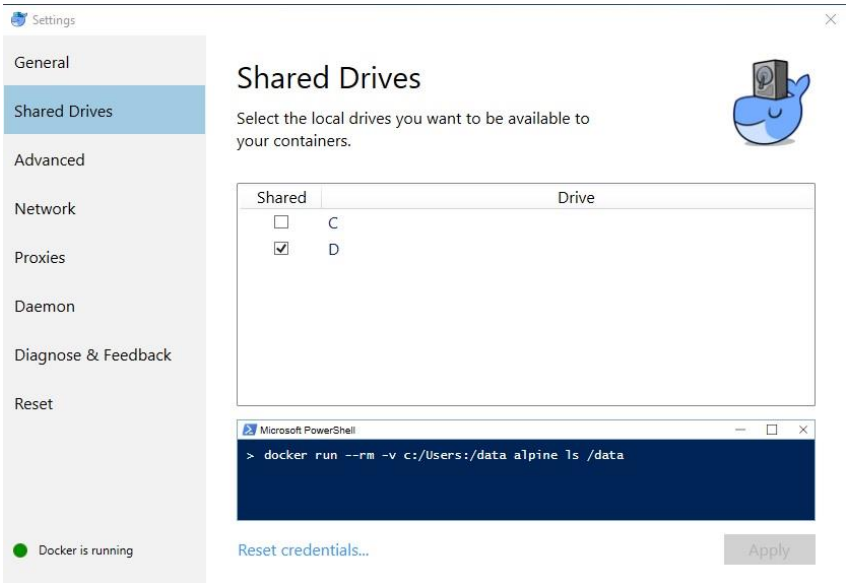
- Clone using Git Bash
    - Open Command Prompt (Windows, Ubuntu, Mac)
    - Navigate to appropriate folder with - example: **cd D:/appropriate/path** (this example path will be used later in this document)
    - Type **git clone https://github.com/mati3230/modalg181.git**
- Clone using Git GUI




## Step 7: Setup Docker

- The drive of D:/appropriate/path should be shared (Ubuntu, Mac)



## Step 8: Check Repository

- Open Command Prompt (Windows, Ubuntu, Mac)
- Type **docker run --rm -it --name test_container -v D:/appropriate/path/modalg181:/modalg181 mati3230/modalg181 python /modalg181/test/test_docker_devel.py**
- Output:

test

test2

test3

- Type **docker run --rm -it --name test_container -v D:/appropriate/path/modalg181:/modalg181 mati3230/modalg181 python /modalg181/test/test_tensorflow.py**
- Output:

Tensor("Const:0", shape=(), dtype=float32) Tensor("Const_1:0", shape=(), dtype=float32)

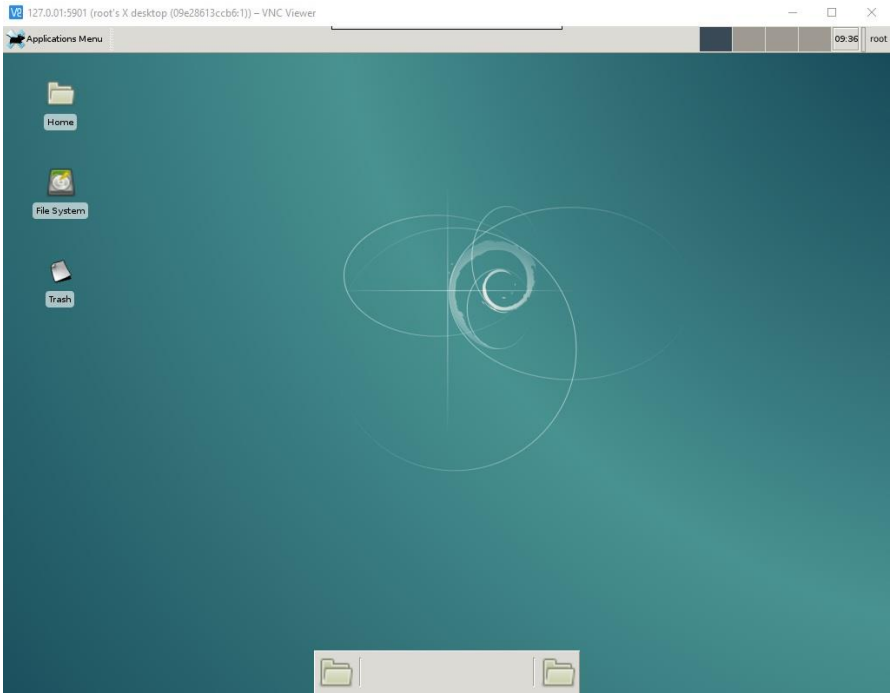
## Step 9: Install VNC-Viewer

- About VNC
- Install Real VNC Viewer

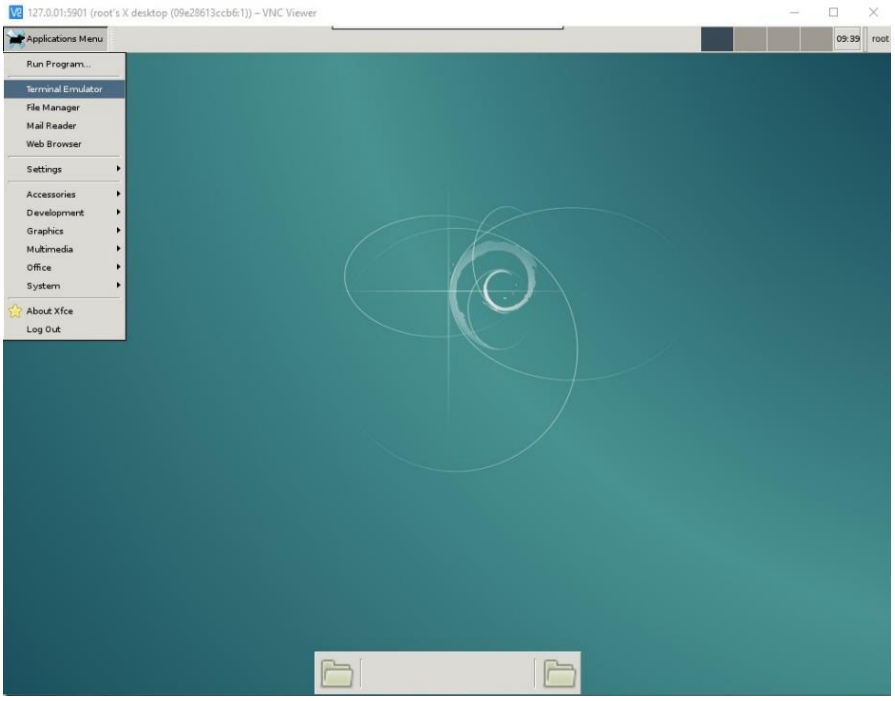
## Step 10: Check UI of Docker Image

- Type **docker run --rm -it --name test_container -p 5901:5901 -v D:/appropriate/path/modalg181:/modalg181 mati3230/modalg181 bash**
- Type **vncserver**
- Start the Real VNC Viewer installed in Step 8
- Type in VNC-Server-Address **127.0.0.1:5901** and press enter
- Press continue in case of a warning
- Type password **12345678**

- Output:

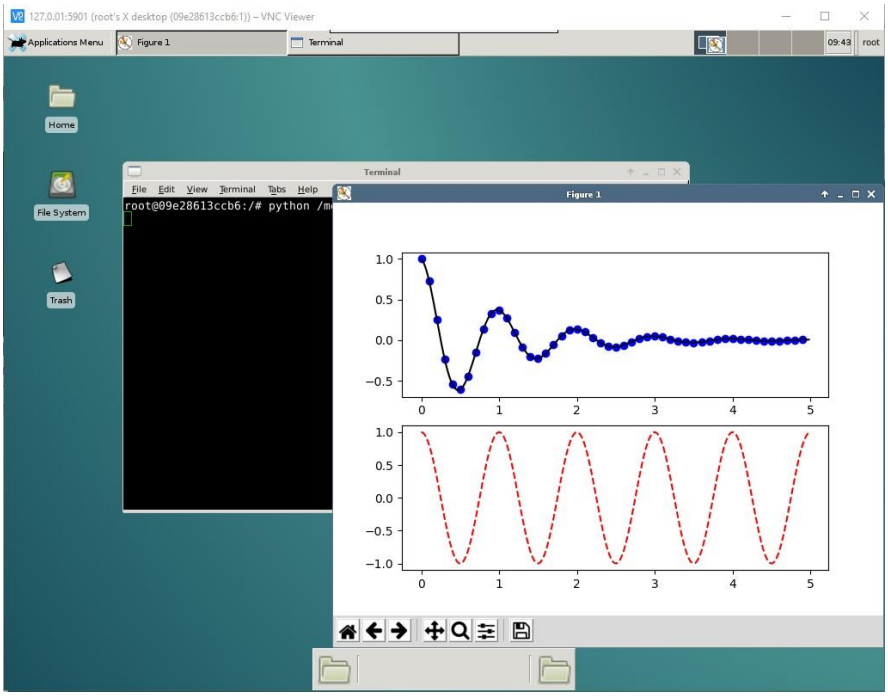



- Open Terminal:

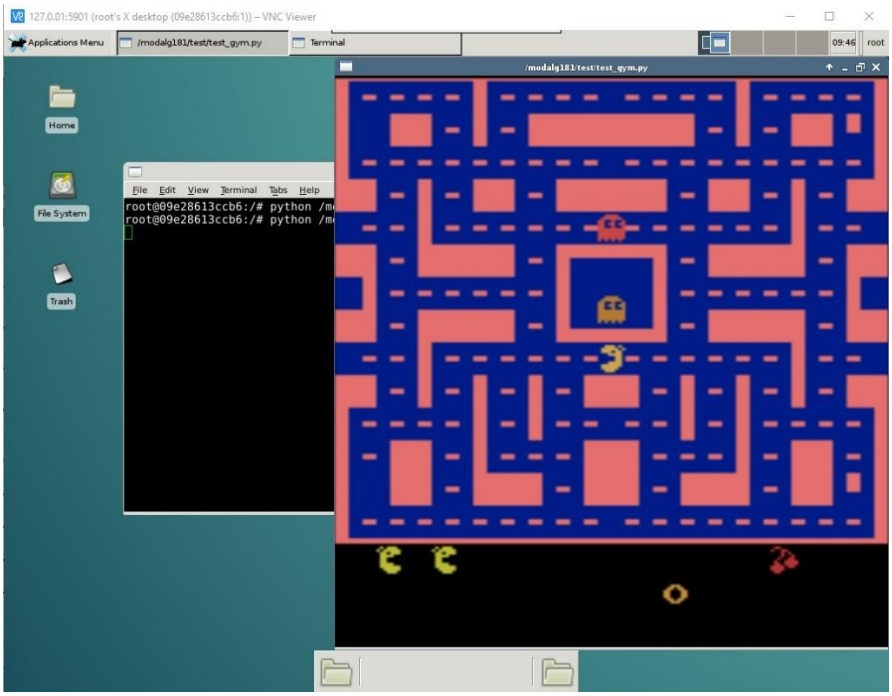



- Type: **python /modalg181/test/test_plot.py**

- Output:



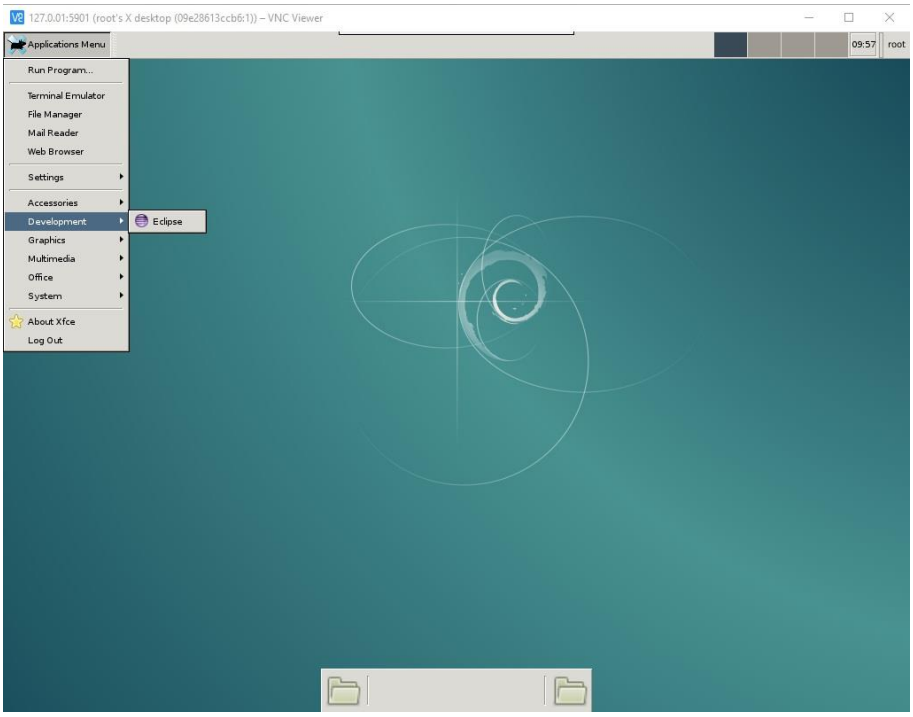

- Close the plot window
- Type **python /modalg181/test/test_gym.py**
- Output:



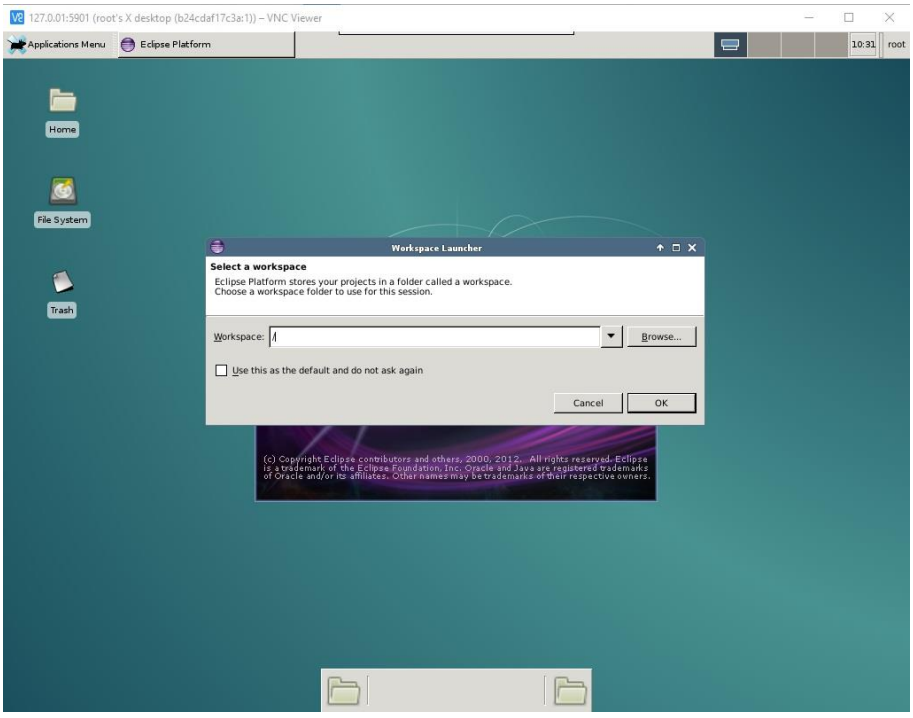

- Close the Real VNC Viewer window
- Type in the bash of first step under Step 10 **vncserver -kill :1**
- Type **vncpasswd** to change the password
    - Answer “Would you like to enter a view-only password (y/n)?” with **n**
- Type **exit** to close the bash

## Step 11: Start the IDE

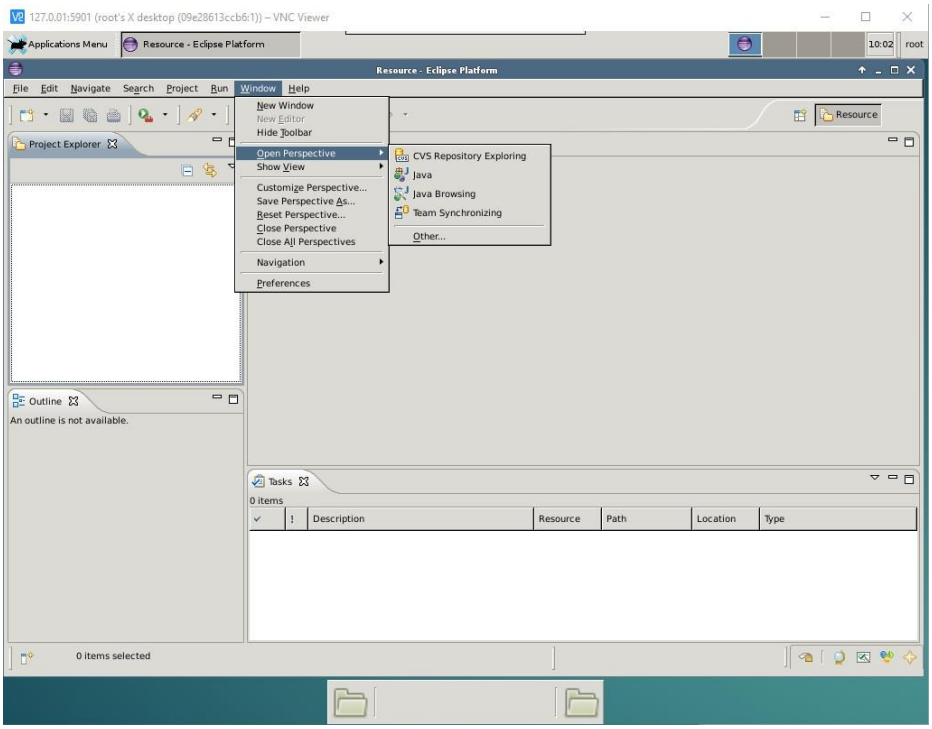
- Bring up the UI with steps described under Step 10
- Start eclipse



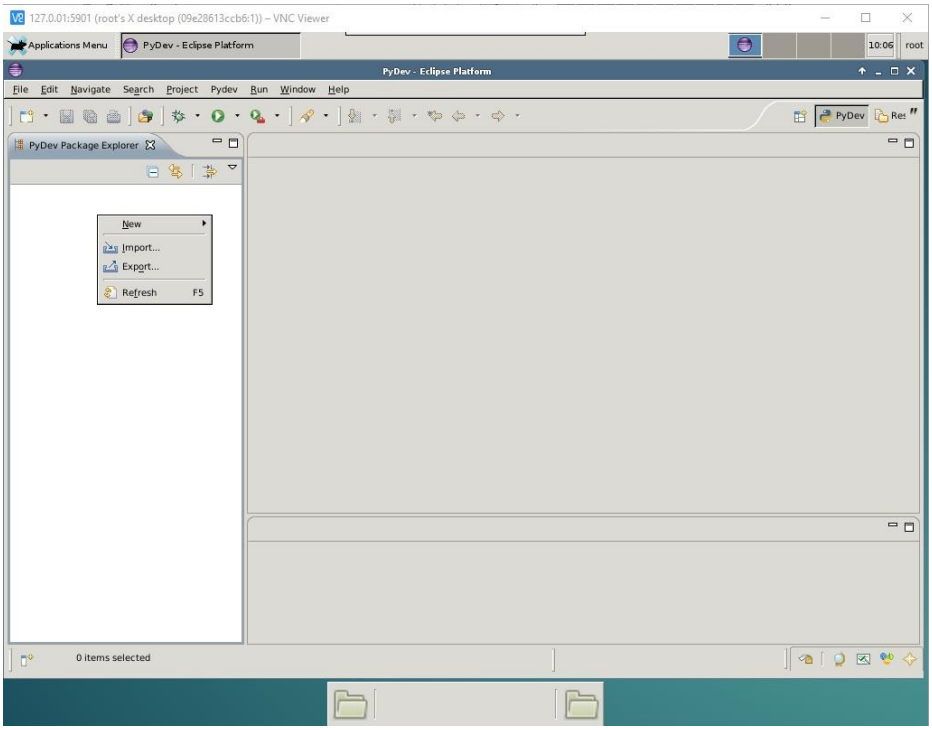

- Set Workspace to **/**



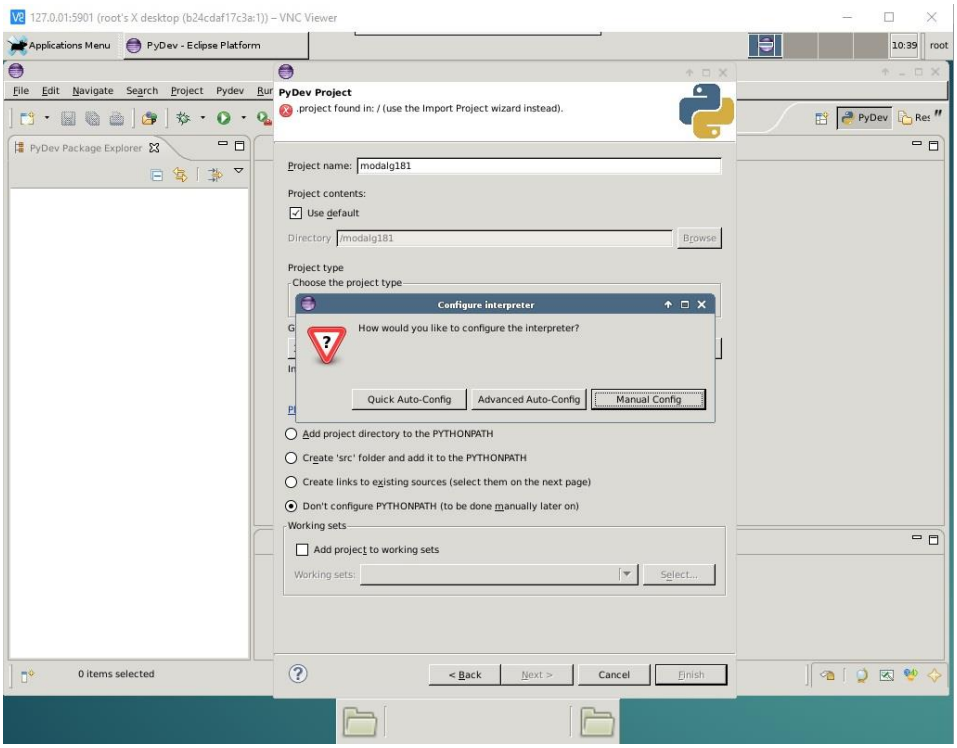
- Press **OK**
- Click on **Workbench**
- Go to **Window/Open Perspective/Other…** under menu bar




- Select **PyDev** and click **OK**
- Click with right mouse button in **PyDev Package Explorer** and click **New/Project…**
- Select **PyDev/PyDev Project** and click **Next >**

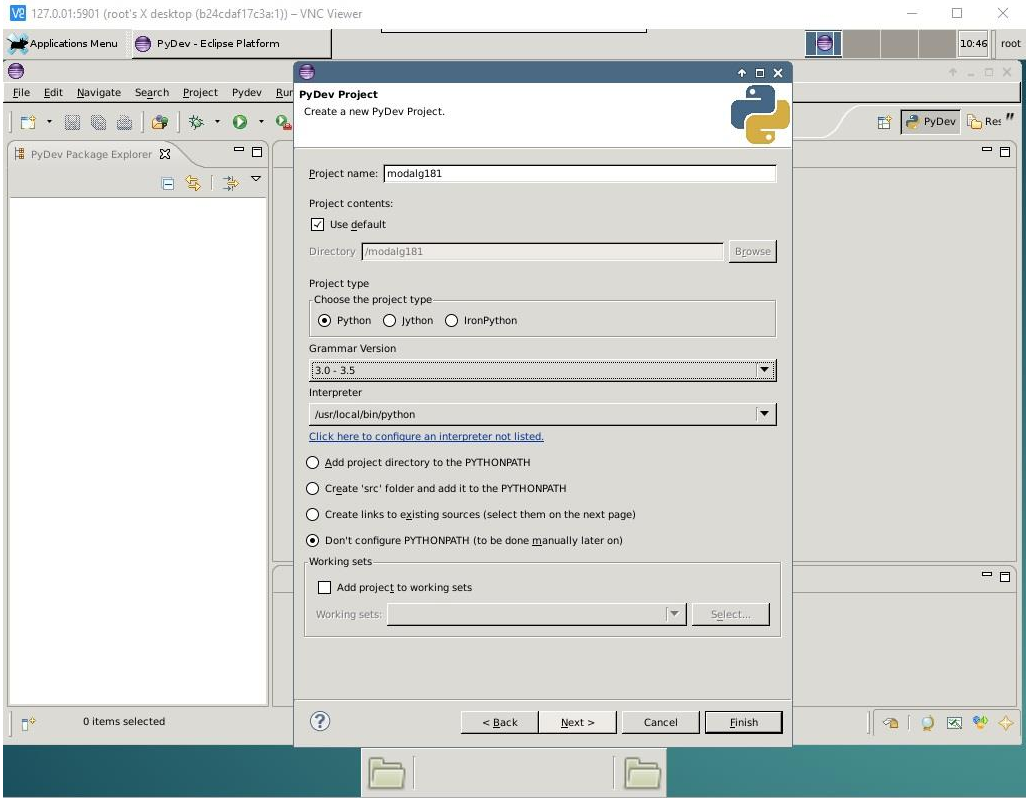


- Type Project name: **modalg181**
- Select **Gammar Version 3.0 – 3.5**
- Select Checkbox **Don’t configure PYTHONPATH (to be done manually later on)**
- Click **Please configure an interpreter before proceeding** and click on button **Manual Config**

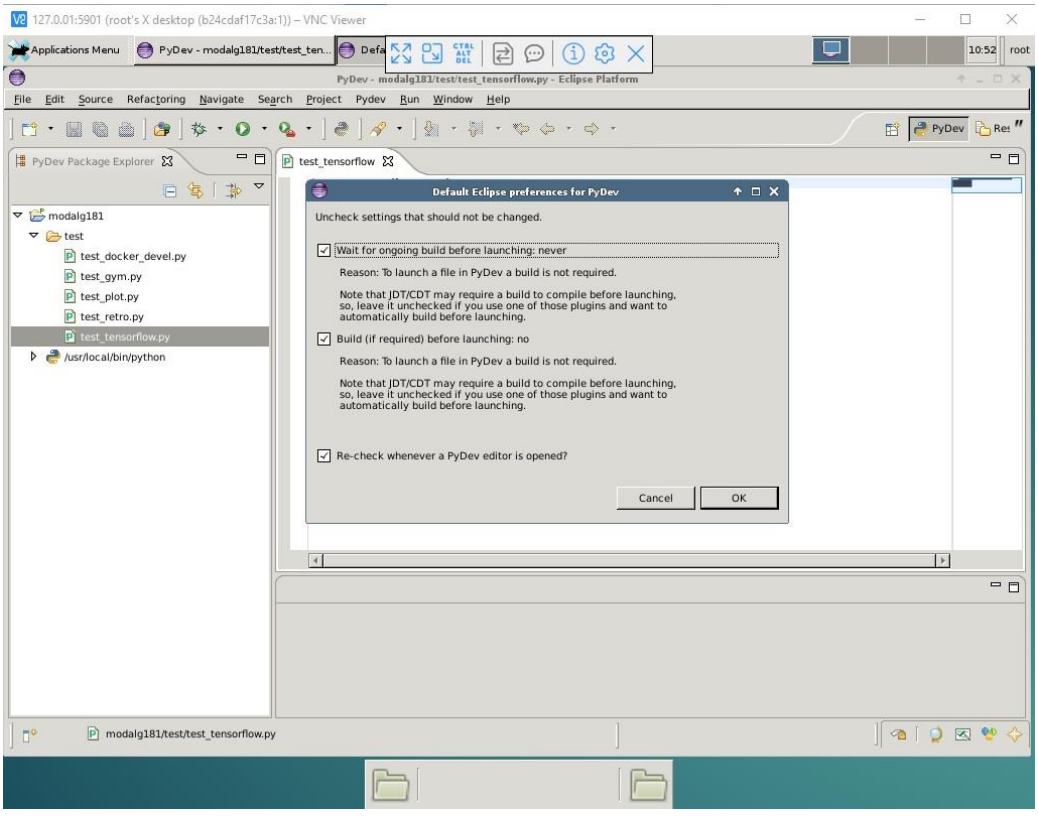



- Click on button **New…**
- Type in box Interpreter Name: **/usr/local/bin/python**
- Type in box Interpreter Executable: **/usr/local/bin/python**
- Click button **Select All** and **OK**
- Click button **Apply** and **OK**

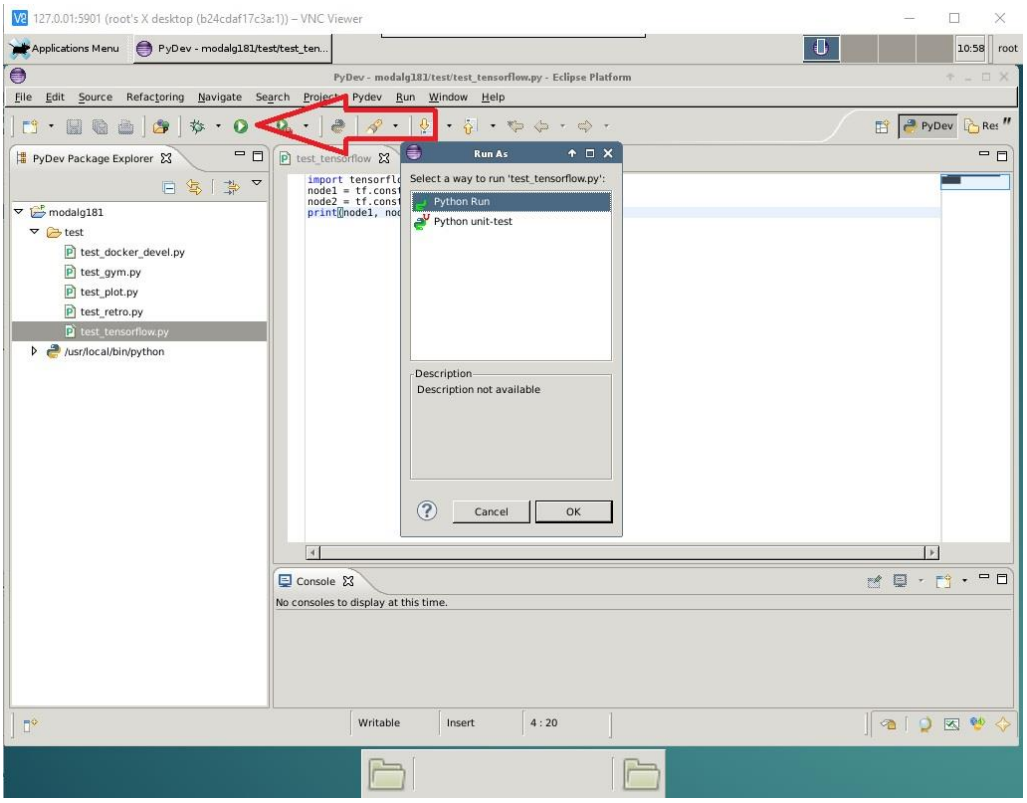
- Your configuration should look like this:




- Click button **Finish**
- Double-Click **modalg181/test/test_tensorflow.py** in PyDev Package Explorer, skip news message and apply Default Eclipse preferences for PyDev with **OK**



- Go to **Window/Show View** in menu bar and click **Console**
- Click in test_tensorflow code view and press **Run As…** button
- Select **Python Run** and click **OK**




- The Console should print:

Tensor("Const:0", shape=(), dtype=float32) Tensor("Const_1:0", shape=(), dtype=float32)

- Close eclipse
- Close Real VNC Viewer
- Type in bash **vncserver -kill :1**
- Press **STRG+p+q** to open terminal
- Type **docker commit test_container my_modalg**
- Type **docker attach test_container** and press two times enter
- Type exit

## Step 12: Check your own Configuration

- Type **docker run --rm -it --name test_container -p 5901:5901 -v D:/appropriate/path/modalg181:/modalg181 my_modalg bash**
- You successfully saved an image with your own configuration
- If you now start eclipse with workspace **/** then project will be saved
- Close again VNC and **exit** container

## Step 13: Download Datasets

- Download datasets from [Nextcloud]


- Unzip to get example path **D:/appropriate/path/datasets/stars_from_google_images**