



Installing Keras in R

Handbook Guide

September 2022



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Python Installation

Installing Python using *Anaconda*

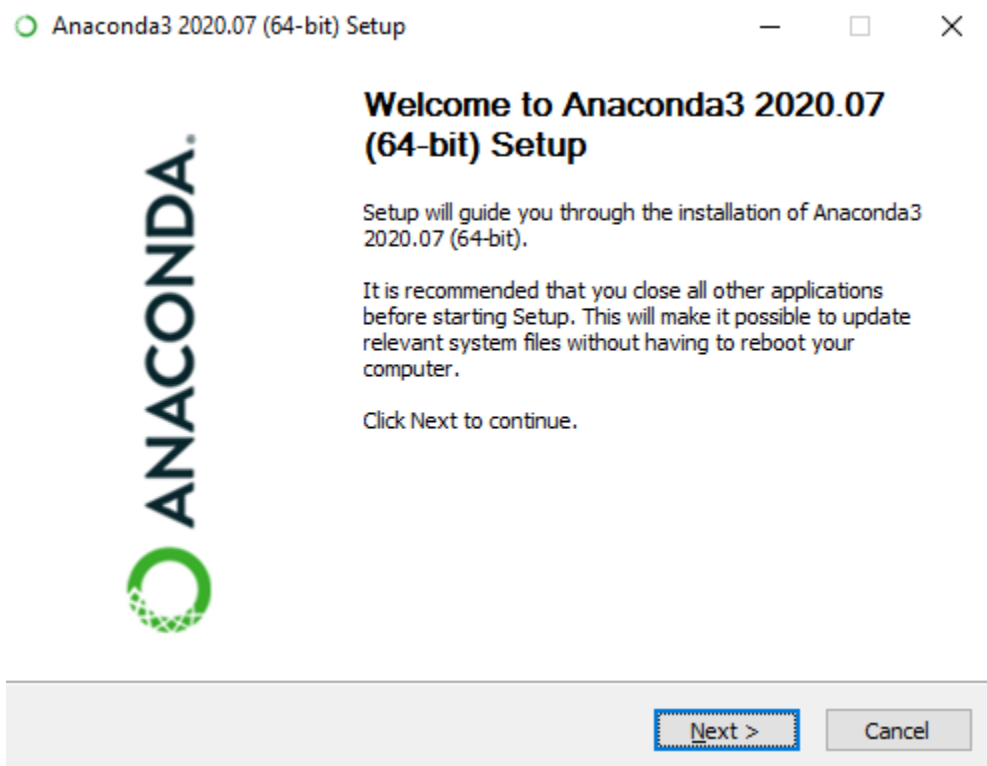
For our Python installation, we will be using and installing a package manager named **Anaconda**. With *Anaconda*, users will not only have Python installed but also will have the necessary packages (i.e. numpy, pandas) utilized in our workshops. Also, *Anaconda* would have included the installation of **Jupyter** - an open-source web application that allows you to create and share Python code. Once opening the link below, **please choose Python version 3.8 for installation.**

Use this link: <https://www.anaconda.com/download>

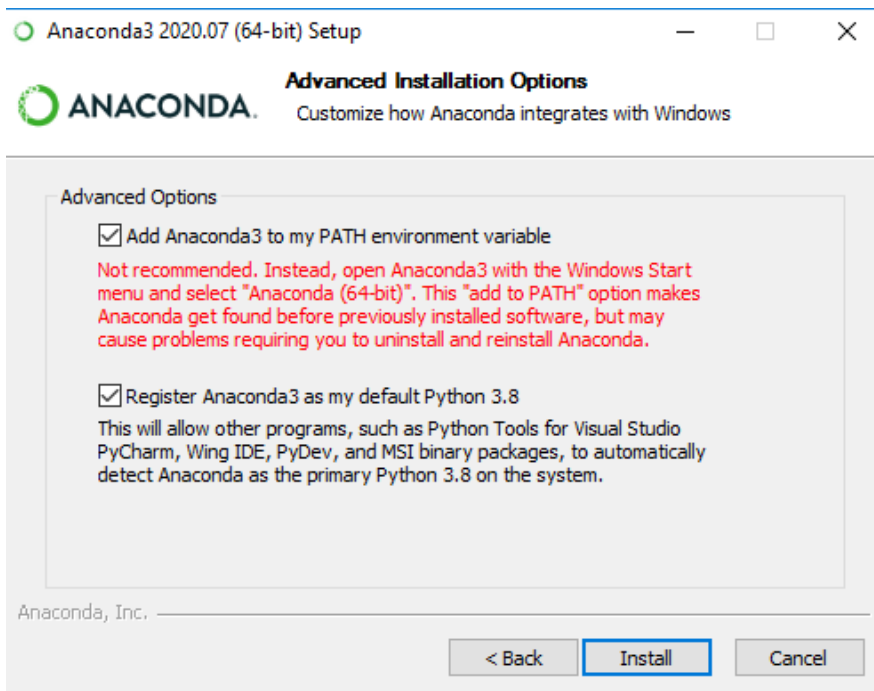
- Choose your appropriate Operating System, make sure you choose the version that is compatible with your pc's bit-rate



- Install **Anaconda**



- For **windows** users make sure you **check Add Anaconda to my PATH to the environment** and then wait until the installation finished.



More info on *Anaconda*:

<https://docs.continuum.io/anaconda/#anaconda-navigator-or-conda>

Warning: For Windows operating systems, if you can't find the conda command from your Command Prompt please add the **C:\User\Anaconda3** and the **C:\User\Anaconda3\Scripts** to the environment variable as shown here:

<https://superuser.com/questions/949560/how-do-i-set-system-environment-variables-in-windows-10>

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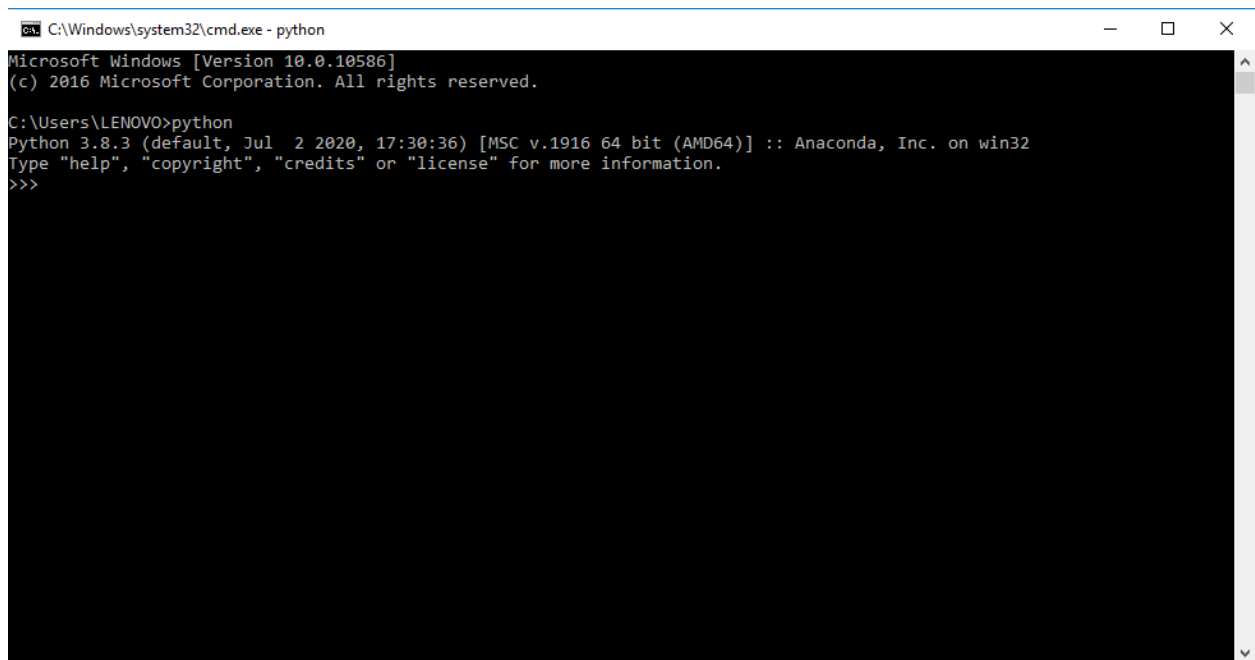
- **For Mac OS X and Linux-based OS:** Open “*Terminal*”
- **For Windows:** Open “*Command Prompt*”

Verify Python Installation:

1. Type the command `python`
2. If the installation was completed successfully, there should be a response which includes information on which Python version was installed as shown below. In this case, it appears the user installed Python version 2.7.13. But make sure yours is 3.8
3. To exit, enter the command `quit()` or use Ctrl-D

```
[Matthews-MacBook-Pro:~ matthewhamdani$ python
Python 2.7.13 [Anaconda 4.4.0 (x86_64)] (default, Dec 20 2016, 23:05:08)
[GCC 4.2.1 Compatible Apple LLVM 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
Anaconda is brought to you by Continuum Analytics.
Please check out: http://continuum.io/thanks and https://anaconda.org
>>>
```

Figure 1: python Response on Mac OS X Terminal



```
C:\Windows\system32\cmd.exe - python
Microsoft Windows [Version 10.0.10586]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\LENOVO>python
Python 3.8.3 (default, Jul 2 2020, 17:30:36) [MSC v.1916 64 bit (AMD64)] :: Anaconda, Inc. on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
```

Figure 2: python Response on Windows Command Prompt

Verify Anaconda Installation

1. Type the command `conda list` in your “Terminal” or “Command Prompt”.
2. not give any response, please check the **Warning** in the installation section, if the problem still persists please contact our teaching assistants for help.

```

(Matthews-MacBook-Pro:~ matthewhamdani$ conda list
# packages in environment at /Users/matthewhamdani/anaconda2:
#
_license                1.1                      py27_1
alabaster                0.7.10                  py27_0
anaconda                 4.4.0                   np112py27_0
anaconda-client          1.6.3                   py27_0
anaconda-navigator       1.6.2                   py27_0
anaconda-project         0.6.0                   py27_0
appnope                  0.1.0                   py27_0
appscript                1.0.1                   py27_0
asn1crypto               0.22.0                  py27_0
astroid                  1.4.9                   py27_0
astropy                  1.3.2                   np112py27_0
babel                    2.4.0                   py27_0
backports                1.0                     py27_0
backports_abc            0.5                     py27_0
beautifulsoup4           4.6.0                   py27_0
bitarray                 0.8.1                   py27_0
blaze                    0.10.1                  py27_0
bleach                   1.5.0                   py27_0
bokeh                    0.12.5                  py27_1
boto                     2.46.1                  py27_0
bottleneck               1.2.1                   np112py27_0

```

Figure 3: conda list Response on Mac OS X Terminal

```
Command Prompt
(c) 2017 Microsoft Corporation. All rights reserved.

C:\Users\Wilson>conda list
# packages in environment at C:\Users\Wilson\Miniconda3:
#
asn1crypto          0.22.0          py36_0
cffi                 1.10.0          py36_0
conda                4.3.21          py36_0
conda-env            2.6.0           0
console_shortcut     0.1.1           py36_1
cryptography         1.8.1           py36_0
idna                 2.5             py36_0
menuinst             1.4.7           py36_0
openssl              1.0.21          vc14_0 [vc14]
packaging            16.8            py36_0
pip                  9.0.1           py36_1
pycosat              0.6.2           py36_0
pycparser             2.17            py36_0
pyopenssl            17.0.0          py36_0
pyparsing            2.1.4           py36_0
python               3.6.1           2
pywin32              220             py36_2
requests             2.14.2          py36_0
ruamel_yaml          0.11.14         py36_1
setuptools            27.2.0          py36_1
six                  1.10.0          py36_0
vs2015_runtime        14.0.25123      0
wheel                 0.29.0          py36_0
```

Figure 4: conda list Response on Windows Command Prompt

`keras` Installation

Installing `keras` in R

- Open your R or Rstudio and you can run:

1. Install `keras` package you can use your UI or type `install.packages("keras")`

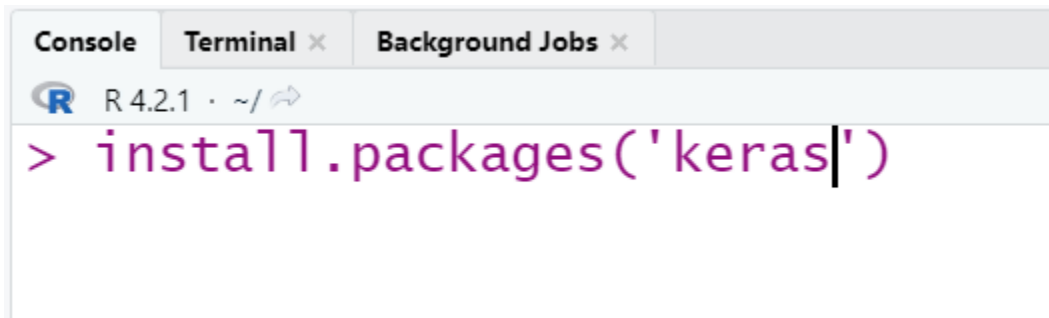


Figure 5 : Installing keras in rstudio console

2. Go to the anaconda prompt if you are windows user or terminal if you are linux/mac user.
3. Type `conda create -n r-tensorflow python=3.7`

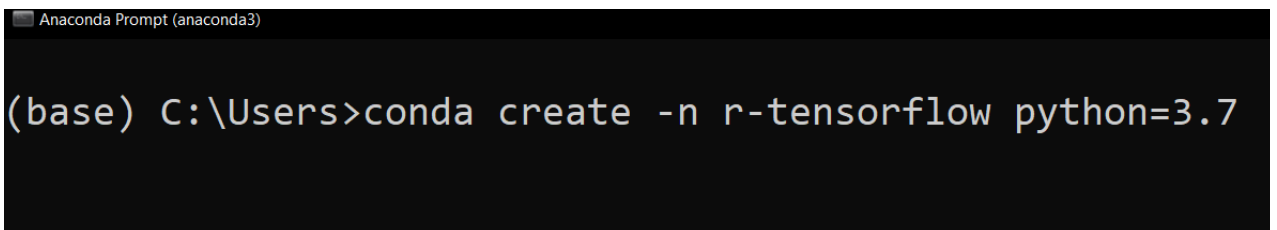


Figure 6 : creating new conda environment

4. Type `y`
5. Type `Conda activate r-tensorflow`

6. Installing tensorflow 2.0. Type `pip install tensorflow==2.0`

```
(base) C:\Users>conda activate r-tensorflow  
(r-tensorflow) C:\Users>pip install tensorflow==2.0
```

Figure 7 : Installing Tensorflow library version 2.0

7. Install protobuf 3.20. Type `pip install protobuf==3.20`.

```
(r-tensorflow) C:\Users>pip install protobuf==3.20
```

Figure 8 : Installing protobuf version 3.20

8. Back to your Rstudio and Restart your R.

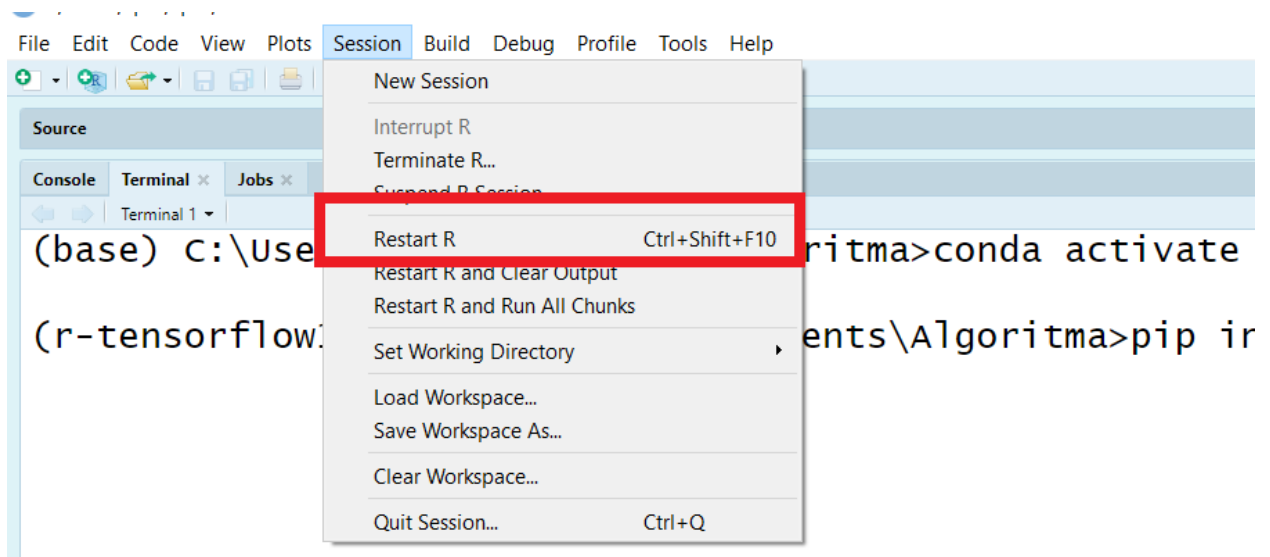


Figure 9: Restarting your R

9. Setting up your conda environment to rstudio

- Go to tools choose global option > python > conda environment

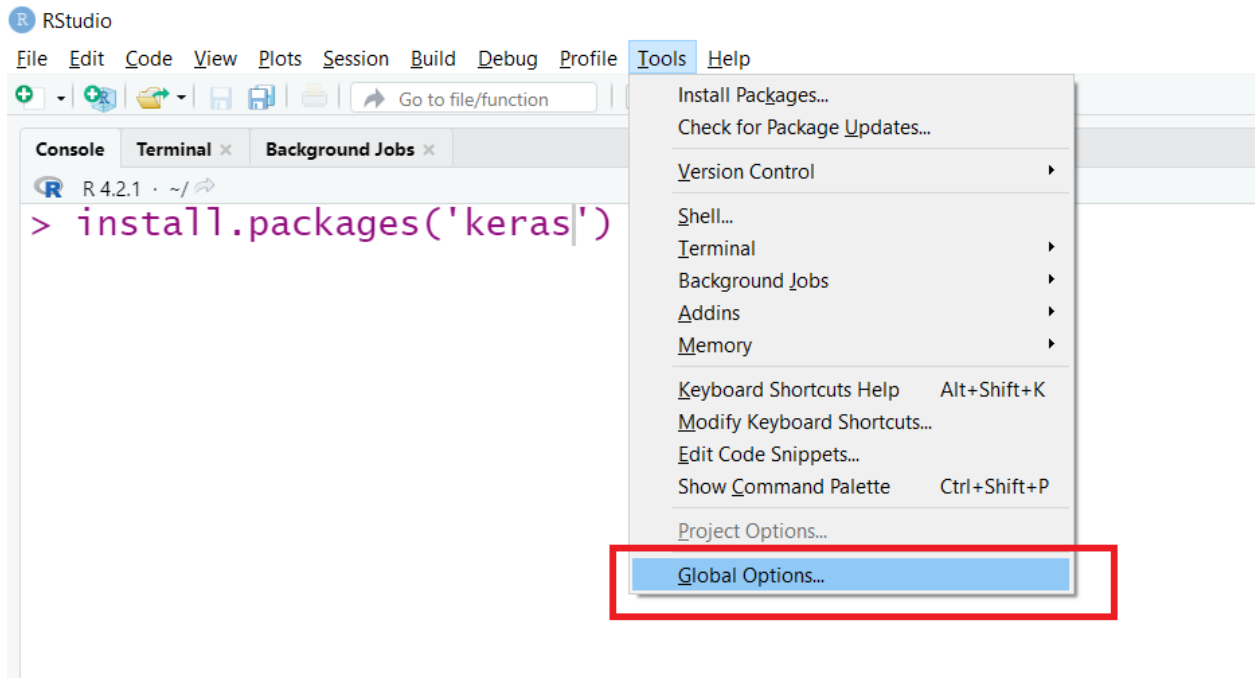


Figure 10: Going to global option

- Choose python then click select

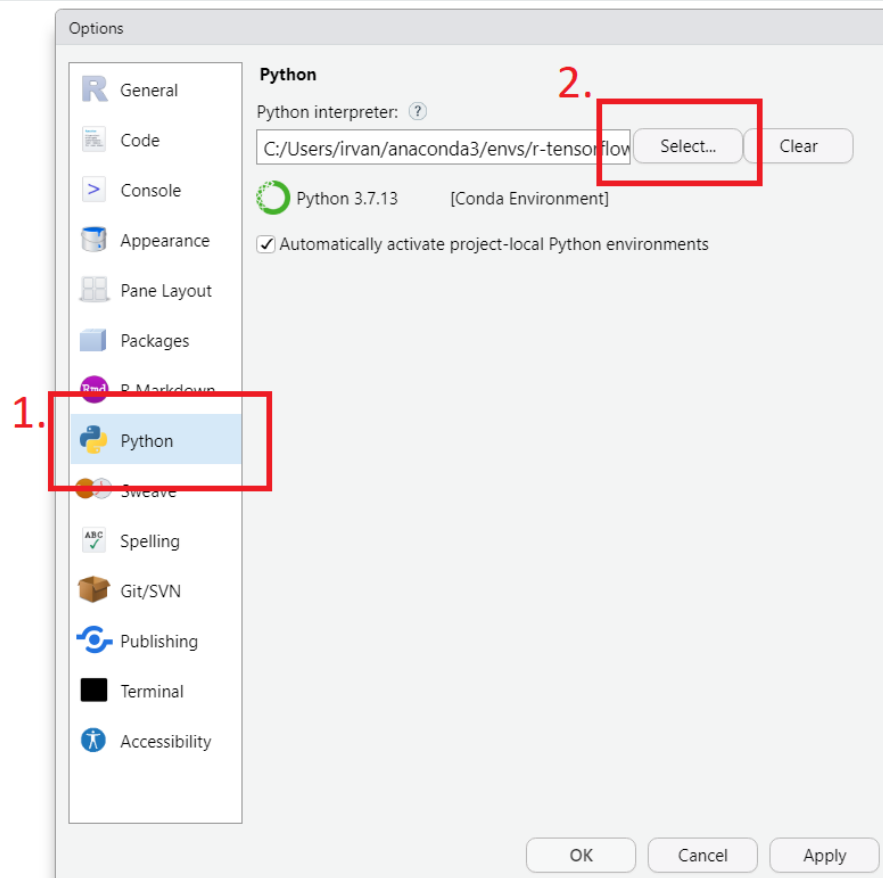


Figure 11: Going to python option

- Choose the conda environment, then choose the 'r-tensorflow' environment you installed earlier. Then press select.

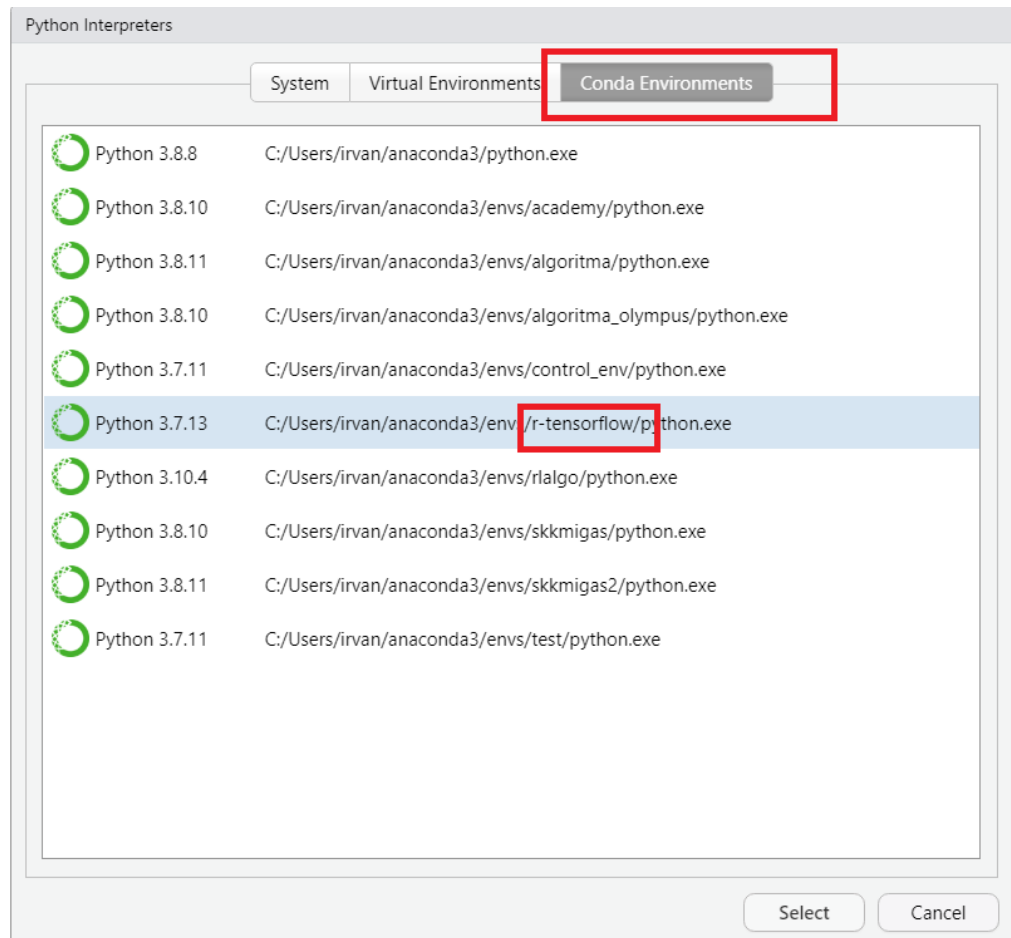


Figure 12: Choosing "r-tensorflow" environment

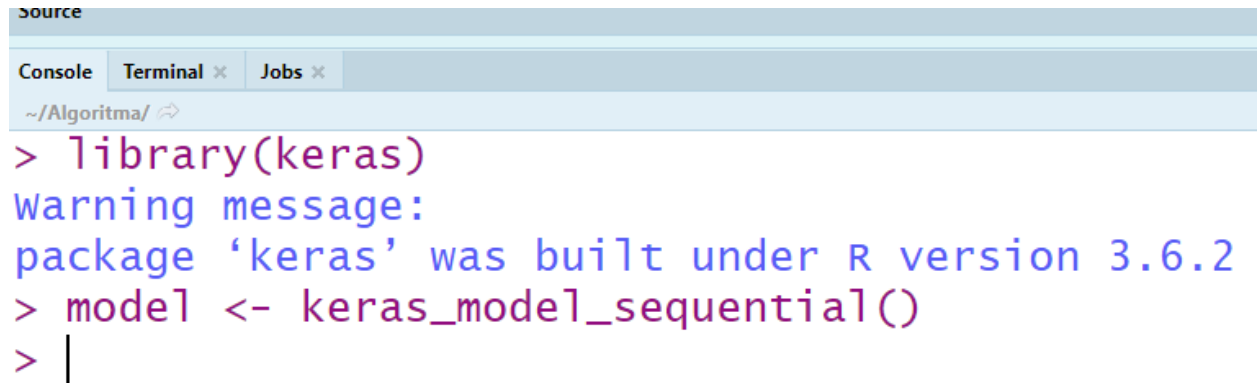
- Press apply then restart your R again.

Verify 'keras' Installation:

1. In your console type `library(keras)`

2. To check if keras is ready, load keras library in R then try:

```
`model <- keras_model_sequential()`
```



The screenshot shows an R console window with the following content:

```
Source  
Console Terminal x Jobs x  
~/Algoritma/ ↵  
> library(keras)  
Warning message:  
package 'keras' was built under R version 3.6.2  
> model <- keras_model_sequential()  
> |
```

Figure 13 : Verifying your `keras` installation

3. If there is no error, then it is ready to use

Common Installation Error Solution

Note: Usually, the installation process ends here. But some users might find problems when they run `keras_model_sequential()`. It's because R use python version 3.8 as default python to run reticulate (package to use python and its environment in R). If you have problem as the picture below, please continue this additional step.

```
> library(keras)
Warning message:
package 'keras' was built under R version 4.0.2
> model <- keras_model_sequential()
Error: Installation of TensorFlow not found.

Python environments searched for 'tensorflow' package:
C:\Users\A S U S\anaconda3\envs\r-tensorflow\python.exe
C:\Users\A S U S\anaconda3\python.exe

You can install TensorFlow using the install_tensorflow() function.
> reticulate::use_python('C:/Users/A S U S/anaconda3/envs/r-tensorflow/python.exe', required = TRUE)
ERROR: The requested version of Python ('C:/Users/A S U S/anaconda3/envs/r-tensorflow/python.exe') cannot be used, as another version of Python ('C:/Users/A S U S/anaconda3/python.exe') has already been initialized. Please restart the R session if you need to attach reticulate to a different version of Python.
Error in reticulate::use_python("C:/Users/A S U S/anaconda3/envs/r-tensorflow/python.exe", :
  failed to initialize requested version of Python
> |
```

4. Make sure the tensorflow 2.0 is successfully installed in r-tensorflow environment by using this step
 - a. Open command prompt (windows) or terminal (Mac Os)
 - b. Run “conda activate r-tensorflow” then “conda list”
 - c. The terminal will print default python packages that are installed in the environment. If you found tensorflow version 2.0, then its successfully installed and you can continue to the next step

Windows:

5. Close the command prompt and re-open then run “conda env list”
6. Copy the directory of r-tensorflow like the picture below

```

C:\Users\LENOVO>conda env list
# conda environments:
#
base                  * C:\Users\LENOVO\AppData\Local\Orange
r-tensorflow          C:\Users\LENOVO\AppData\Local\R-MINI~1
                     C:\Users\LENOVO\AppData\Local\R-MINI~1\envs\r-reticulate
                     C:\Users\LENOVO\anaconda3
                     C:\Users\LENOVO\anaconda3\envs\r-tensorflow

C:\Users\LENOVO>
```

7. Open R studio then run this code sequentially. You can run in the console or create new chunk
reticulate::use_python("directory r-tensorflow2",required=TRUE) *note: change \ to/*
library(keras)
Model <- keras_model_sequential

Example:

```

{r}
reticulate::use_python("C:/Users/LENOVO/anaconda3/envs/r-tensorflow",required=TRUE)
library(keras)
Model <- keras_model_sequential()
```

8. If there's no error when running `keras_model_sequential()`, then you good to go

MacOs

1. After you make sure the tensorflow 2.0 is installed in r-tensorflow environment, run this following code sequentially. You can run in the console or create new chunk

```
library(tensorflow)
use_condaenv("r-tensorflow2")
library(keras)
Model <- keras_model_sequential()
```

2. If there's no error when running `keras_model_sequential()`, then you are good to go
