

Installation Manual for Gurobi 9.5 with Python 3.7 and Anaconda/Spyder

Matthias Walter (m.walter@utwente.nl)

February 23, 2022

This manual explains the installation of the optimization software Gurobi 9.5, using Python version 3 as an interface. Python is used to make the integer programming model known to Gurobi, ask it to solve the model, and finally to access the resulting solution. The manual also explains how to install Python version 3 including the distribution Anaconda. We recommend to use the development environment Spyder that is shipped with Anaconda.

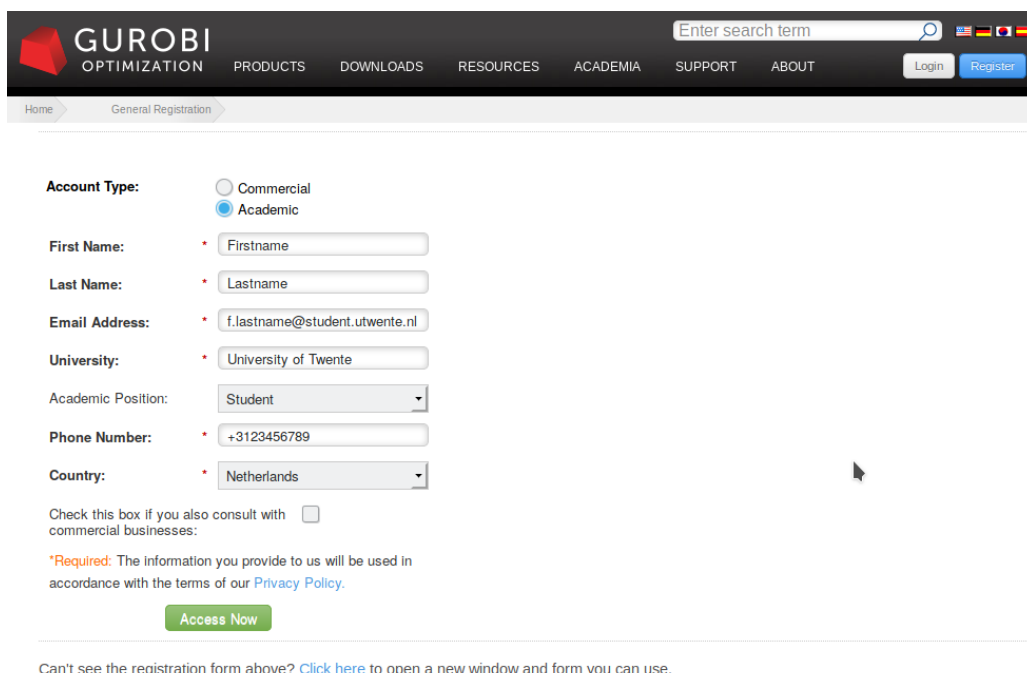
A detailed manual and additional examples can be found in the quickstart guides for the corresponding operating systems [Windows](#), [Linux](#), or [Mac](#).

At the end of this manual you can find information on typical errors.

1 Installing Gurobi

1.1 Obtaining a license

In order to use Gurobi, a license is required. As a student, the license can be obtained for free [here](#). When creating an account, select “academic” and specify your UTwente mail address. Make sure that the mail address is spelled correctly.



The screenshot shows the Gurobi Academic Registration form. The header includes the Gurobi logo, navigation links (PRODUCTS, DOWNLOADS, RESOURCES, ACADEMIA, SUPPORT, ABOUT), a search bar, and flags for language selection. The form itself is titled "General Registration" and includes the following fields:

- Account Type:** Radio buttons for "Commercial" and "Academic" (selected).
- First Name:** Text input field with placeholder "Firstname".
- Last Name:** Text input field with placeholder "Lastname".
- Email Address:** Text input field with placeholder "f.lastname@student.utwente.nl".
- University:** Text input field with placeholder "University of Twente".
- Academic Position:** Dropdown menu with "Student" selected.
- Phone Number:** Text input field with placeholder "+3123456789".
- Country:** Dropdown menu with "Netherlands" selected.

Below the form, there is a checkbox for "Check this box if you also consult with commercial businesses:" and a note: "*Required: The information you provide to us will be used in accordance with the terms of our [Privacy Policy](#)." At the bottom of the form is a green "Access Now" button.

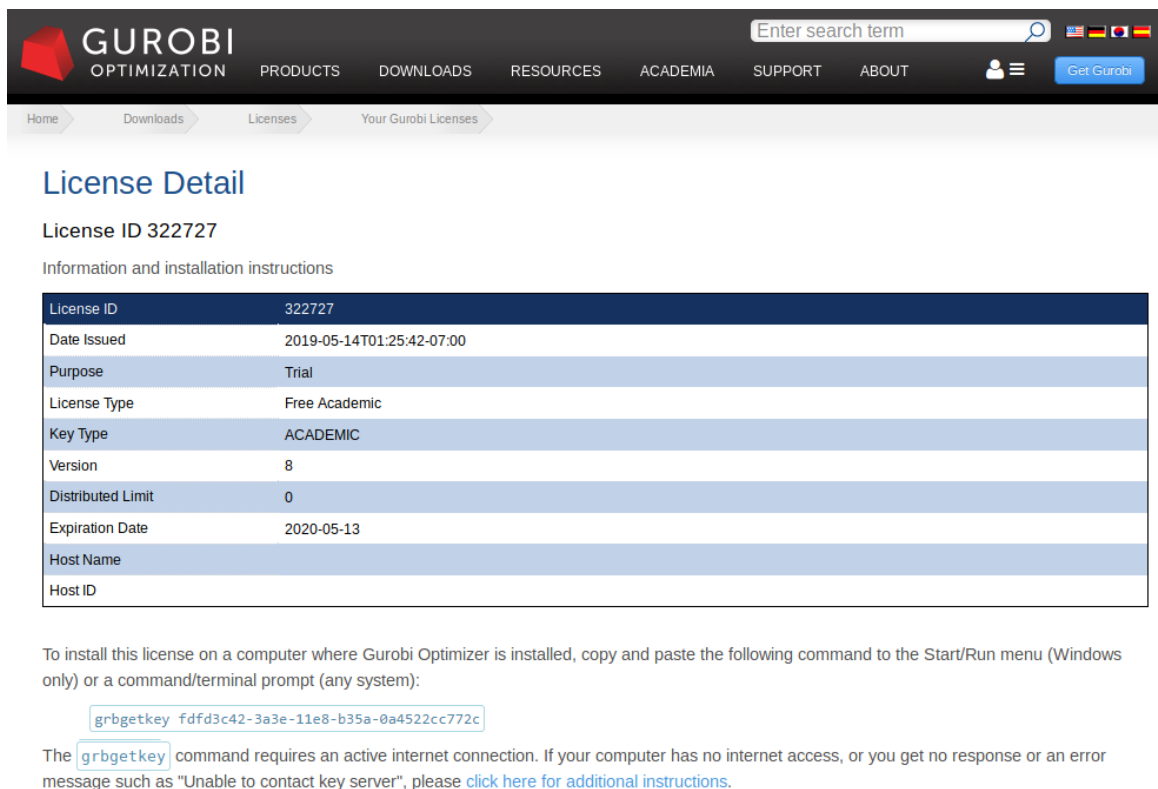
Can't see the registration form above? [Click here](#) to open a new window and form you can use.

1.2 Downloading the software

When logged in, the current Gurobi version for the corresponding operating system can be obtained [here](#). The distinction between 32 und 64 bits is important. If you are unsure which bit number to use, you can find help in this [Manual for Windows](#) or [Manual for Mac](#). Finally, the most recent version of Gurobi should be installed.

1.3 Adding the license to Gurobi

Select the [license](#), copy (as shown below) the `grbgetkey`-command, and execute it in the console. Under Windows, open the start menu and search for `cmd.exe` in the search field. Under Mac or Linux, open a terminal.



The screenshot shows the Gurobi website's 'License Detail' page. The header includes the Gurobi logo and navigation links. The main content area displays the license ID 322727 and a table of details. Below the table, there is a text block explaining how to install the license and a code box containing the `grbgetkey` command.

License ID	322727
Date Issued	2019-05-14T01:25:42-07:00
Purpose	Trial
License Type	Free Academic
Key Type	ACADEMIC
Version	8
Distributed Limit	0
Expiration Date	2020-05-13
Host Name	
Host ID	

To install this license on a computer where Gurobi Optimizer is installed, copy and paste the following command to the Start/Run menu (Windows only) or a command/terminal prompt (any system):

```
grbgetkey fdfd3c42-3a3e-11e8-b35a-0a4522cc772c
```

The `grbgetkey` command requires an active internet connection. If your computer has no internet access, or you get no response or an error message such as "Unable to contact key server", please [click here](#) for additional instructions.

```
Eingabeaufforderung - grbgetkey fdfd3c42-3a3e-11e8-b35a-0a4522cc772c
Microsoft Windows [Version 10.0.16299.309]
(c) 2017 Microsoft Corporation. Alle Rechte vorbehalten.

C:\Users\RaphaelHouben>grbgetkey fdfd3c42-3a3e-11e8-b35a-0a4522cc772c

Gurobi license key client (version 7.5.2)
Copyright (c) 2017, Gurobi Optimization, Inc.

-----
Contacting Gurobi key server...
-----

Key for license ID 232478 was successfully retrieved.
License expires at the end of the day on 2019-04-07.

-----
Saving license key...
-----

In which folder would you like to store the Gurobi license key file?
[hit Enter to store it in C:\Users\RaphaelHouben]:

--> License key saved to file 'C:\Users\RaphaelHouben\gurobi.lic'.

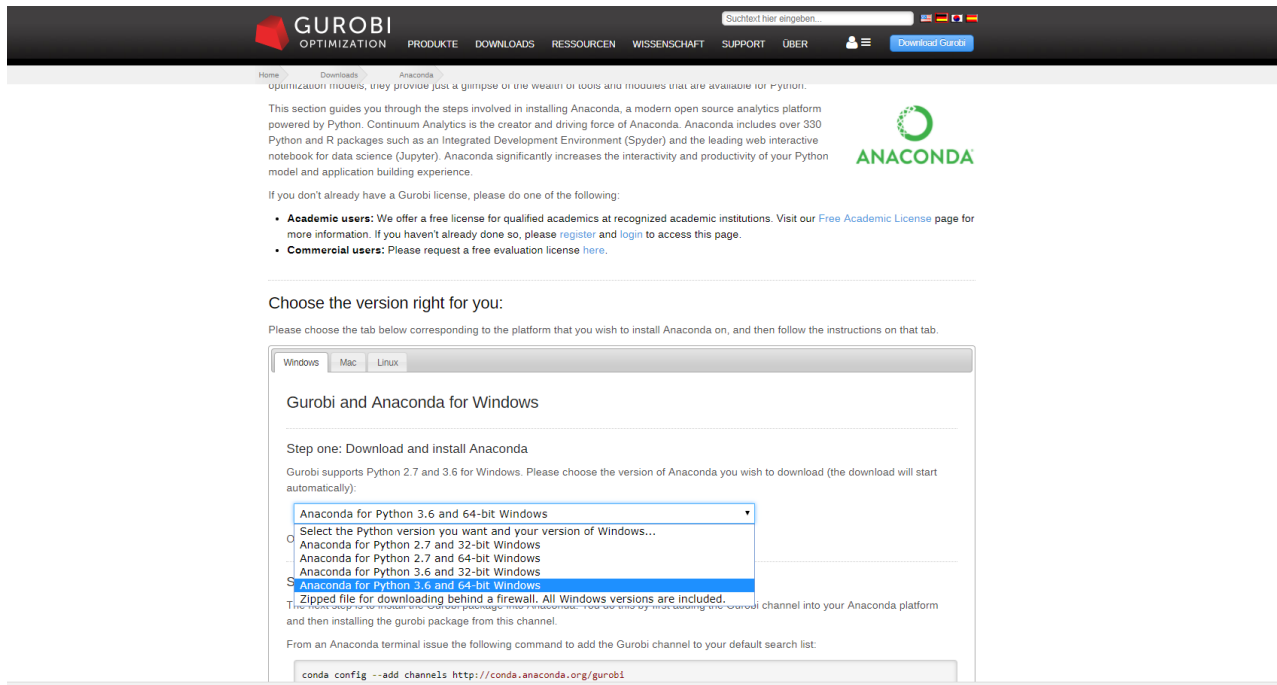
Press [Enter] to exit
```

To avoid problems, use the suggested directory for storing the license file!

2 Installing the Anaconda Python distribution

2.1 Downloading and installing the distribution

Now, the **Anaconda package** can be downloaded and installed; select the Python version 3.7 for the appropriate bit number for your platform.



The screenshot shows the Gurobi website's Anaconda download page. The page is titled "Gurobi and Anaconda for Windows" and provides instructions for installing Anaconda. It includes a dropdown menu to select the Python version and Windows architecture. The selected option is "Anaconda for Python 3.6 and 64-bit Windows". Below the dropdown, there is a text box with the command "conda config --add channels http://conda.anaconda.org/gurobi".

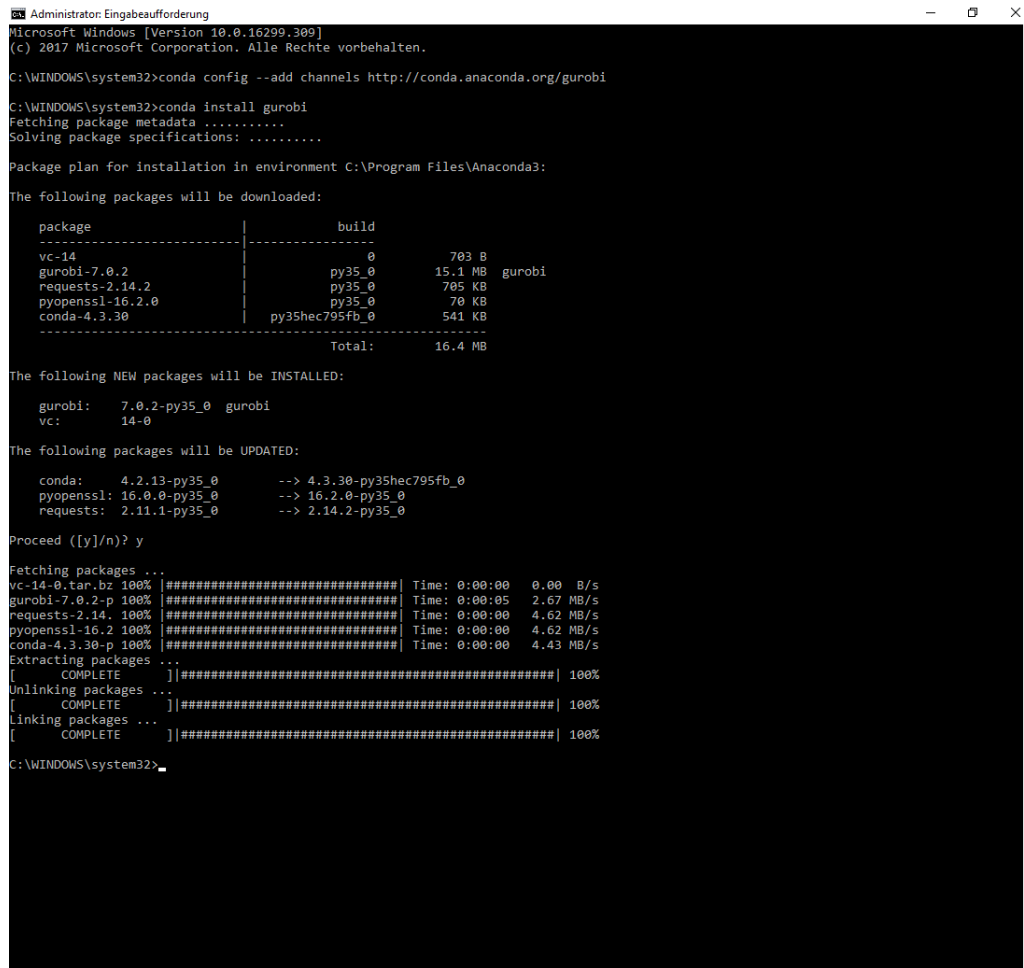
2.2 Downloading and installing the Gurobi module

Finally, the console or terminal has to be opened again to enter the following commands. Under Windows the **Anaconda prompt**, which can be found in the start menu, is recommended.

In the console, type the following:

```
conda config --add channels http://conda.anaconda.org/gurobi [ENTER]
```

```
conda install gurobi [ENTER]
```



```
Administrator: Eingabeaufforderung
Microsoft Windows [Version 10.0.16299.309]
(c) 2017 Microsoft Corporation. Alle Rechte vorbehalten.

C:\WINDOWS\system32>conda config --add channels http://conda.anaconda.org/gurobi

C:\WINDOWS\system32>conda install gurobi
Fetching package metadata .....
Solving package specifications: .....

Package plan for installation in environment C:\Program Files\Anaconda3:

The following packages will be downloaded:

package | build | size |
-----|-----|-----|
vc-14 | 0 | 703 B |
gurobi-7.0.2 | py35_0 | 15.1 MB | gurobi
requests-2.14.2 | py35_0 | 705 KB |
pyopenssl-16.2.0 | py35_0 | 70 KB |
conda-4.3.30 | py35hec795fb_0 | 541 KB |
-----|-----|-----|
Total: | 16.4 MB |

The following NEW packages will be INSTALLED:

gurobi: 7.0.2-py35_0 gurobi
vc: 14-0

The following packages will be UPDATED:

conda: 4.2.13-py35_0 --> 4.3.30-py35hec795fb_0
pyopenssl: 16.0.0-py35_0 --> 16.2.0-py35_0
requests: 2.11.1-py35_0 --> 2.14.2-py35_0

Proceed ([y]/n)? y

Fetching packages ...
vc-14-0.tar.bz2 100% |#####| Time: 0:00:00 0.00 B/s
gurobi-7.0.2-p 100% |#####| Time: 0:00:05 2.67 MB/s
requests-2.14. 100% |#####| Time: 0:00:00 4.62 MB/s
pyopenssl-16.2 100% |#####| Time: 0:00:00 4.62 MB/s
conda-4.3.30-p 100% |#####| Time: 0:00:00 4.43 MB/s
Extracting packages ...
[ COMPLETE ]|#####| 100%
Unlinking packages ...
[ COMPLETE ]|#####| 100%
Linking packages ...
[ COMPLETE ]|#####| 100%

C:\WINDOWS\system32>
```

If, during the second step, you are asked whether a package should be updated, confirm this with **y** [ENTER]

For Windows users:

If the environment variables of Anaconda are not set (a message stating that **"conda"** was not found), enter the two commands in the console of Anaconda (program: **Anaconda Prompt**).

2.3 Testing the installation

In order to test the installation, obtain the file **"gcd.py"** from the course page and open Spyder (by searching for Spyder in the Windows search bar). Finally, open the file, e.g., by dragging it into Spyder (alternatively, open it with a double-click and select Spyder from the list of installed programs, or by choosing **File→Open in Spyder**).

After running the file (green **"play"** symbol in the top bar), you should see the following output:

```

1 from gurobipy import *
2
3 a = 8638
4 b = 42
5
6 # Create (empty) model.
7 model = Model("Integer program for GCD")
8
9 # Add variables.
10 x = model.addVar(name='x', vtype=GRB.INTEGER, lb=GRB.INFINITY, obj=a)
11 y = model.addVar(name='y', vtype=GRB.INTEGER, lb=GRB.INFINITY, obj=b)
12
13 # Always do this after adding variables.
14 model.update()
15
16 # Add constraints
17 model.addConstr( a * x + b * y == 1)
18
19 # Always do this after adding constraints.
20 model.update()
21
22 # Solve the model.
23 model.optimize()
24
25 if model.status == GRB.OPTIMAL:
26     print('Solved to optimality. gcd of %s and %s is %s.' % (a, b, model.objVal))
27 else:
28     print('Could not solve to optimality.')
29

```

```

Python 3.7.3 (default, Mar 27 2019, 22:11:17)
Type "copyright", "credits" or "license()" for more information.
IPython 7.4.0 -- An enhanced Interactive Python.

In [1]: runfile('/home/matthias/uni/teaching/gurobi-python/gcd.py', wdir='/home/
matthias/uni/teaching/gurobi-python')
Academic license - for non-commercial use only
Optimize a model with 1 rows, 2 columns and 2 nonzeros
Variable types: 0 continuous, 2 integer (0 binary)
Coefficient statistics:
  Matrix range [4e+01, 9e+03]
  Objective range [4e+01, 9e+03]
  Bounds range [0e+00, 0e+00]
  RHS range [1e+00, 1e+00]
Found heuristic solution: objective 42.00000000
Presolve time: 0.00s
Presolved: 1 rows, 2 columns, 2 nonzeros
Variable types: 0 continuous, 2 integer (0 binary)
Root relaxation: objective 1.4000000e+01, 1 iterations, 0.00 seconds

Nodes | Current Node | Objective Bounds | Gap | It/Node | Work
Expl Unexpl | Obj Depth IntInf | Incumbent BestBd | Gap | It/Node | Time
0 0 14.000000 0 1 42.000000 14.00000 66.7% - 0s
0 0 14.000000 0 1 42.000000 14.00000 66.7% - 0s
0 2 14.000000 0 1 42.000000 14.00000 66.7% - 0s
H 2 3 28.00000000 14.00000 50.0% 0.5 0s
H 3 1 14.00000000 14.00000 0.00% 0.7 0s

Explored 4 nodes (3 simplex iterations) in 0.01 seconds
Thread count was 4 (of 4 available processors)

Solution count 3: 14 28 42

Optimal solution found (tolerance 1.00e-04)
Best objective 1.4000000000000e+01, best bound 1.4000000000000e+01, gap 0.0000%
Solved to optimality. gcd of 8638 and 42 is 14.0.

In [2]:

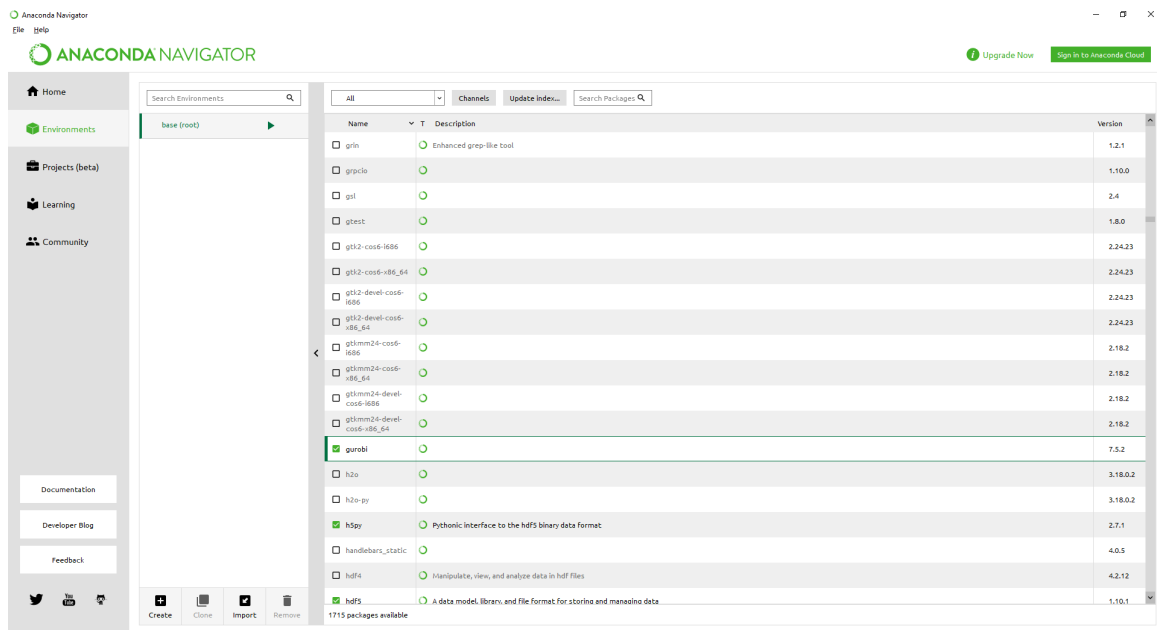
```

3 Frequent errors

- If the test was not successful, please try to do the following:
 1. Open the command prompt, if necessary with administrator privileges.
 2. Navigate, using the `cd` command, into the Gurobi directory; to this end, type `cd` followed by [space] and the file path of the Gurobi directory in quotes (""). The file path can be obtained by opening the Gurobi directory and clicking to an empty position in the navigation/explorer bar (the file path can then be entered manually or pasted into the console via right-click).
 3. In the Gurobi directory, execute the command `python setup.py install`. If you don't have the privileges to execute this command, open the command prompt as an administrator.
 4. Finally, test again.

If the error message `no module named gurobipy` appears you may try to install the package in a different way. To this end, open the **Anaconda-Navigator** and choose the tab **Environments**. In the box stating **Installed** select **All** instead. Now search for the package **gurobi**, mark it and start the installation with **Apply**.

- For MacOS users:
If Spyder states the error message **Kernel died** and the terminal shows **segmentation fault 11**, the combination of Spyder and Python 3.7 will not work for your system.
You can install **PythonIDLE** in the version 3.7.3. Now, only the module **gurobipy** has to be installed for **PythonIDLE**. To this end, open the terminal, and go to the directory containing the `setup.py` file of gurobi. If you did not change the installation path of gurobi, this directory will be `/Library/gurobi752/mac64`. Hence, enter the following commands:



```
cd /Library/gurobi950/mac64 [ENTER]
python3.7 setup.py install [ENTER]
```

- Sometimes, the output of Spyder states the error that the Gurobi license has the wrong version number. This can happen if the Gurobi version is not up to date. Anaconda always installs the most recent version of the Gurobi interface. If the error appears, install the most recent version and request a new license (see above).
- For Windows users:

If the `conda config --add channels` command contained the wrong address (e.g., due to a typo), it must be removed again, since otherwise the installation will fail. The address is stored in `C:\User\[Username]\.condarc`. If not sure, simply remove this file as it will be recreated automatically.

If the user name contains special characters it may happen that the installation of Anaconda fails. An alternative to Anaconda is WinPython. We recommend the **version 3.6.3.0** since the newer versions (3.6.4.x and 3.6.5.x) produced errors. Similar to Anaconda, WinPython contains Python and Spyder. After the installation of WinPython, you have to make Gurobi known to Python. To this end, execute the first steps of this section.

- If also the installation of WinPython fails, Python(x,y) may be used as an alternative or Python and Spyder are installed separately by hand. Both are described under <https://pythonhosted.org/spyder/installation.html>. The manual installation is titled “The hard way”. Similar to WinPython, you have to make Gurobi known to Python.

Please pose potential questions to **m.walter@utwente.nl**. Only contact the Gurobi support if we could not help you!

Good luck with the installation!