

MATLAB

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MATLAB

Overview Getting Started Features & Capabilities Support Packages For Students

Math. Graphics. Programming.

MATLAB is a programming and numeric computing platform used by millions of engineers and scientists to analyze data, develop algorithms, and create models.

Get MATLAB

What Is MATLAB?

Designed for the way you think and the work you do.

MATLAB combines a desktop environment tuned for iterative analysis and design processes with a programming language that expresses matrix and array mathematics directly. It includes the Live Editor for creating scripts that combine code, output, and

Professionally Built

MATLAB toolboxes are professionally developed, rigorously tested, and fully documented.

With Interactive Apps

1- Sign in. You will need to use your EPFL email.

MathWorks®

Sign In

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By signing in you agree to our [privacy policy](#).

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What Is MATLAB?

4- Proceed to install MATLAB and choose the R2020b version.

Select Release
R2020b

I Want To:
Install Products

Get MATLAB and Simulink Products

Download for Windows
(295 MB)

Includes R2024a Update 5
Released: 12 Jul 2024

5- Follow the normal procedure and make sure you don't download the **Text Analytics Toolbox** when installing MATLAB.

IBM ILOG CPLEX:

- 1- Access the [IBM website](#) and register for an academic account.



Enter your academic institution issued email to begin

Only the students and faculty of participating academic institutions are eligible to access this website. Please enter your academic institution issued email below to register.

Your academic institution issued email

Find answers in our [frequently asked questions](#)

Submit

- 2- After finishing registration, you will be redirected to the [products site](#). Choose Data Science then ILOG CPLEX Optimization studio and press download.

IBM SkillsBuild Software Downloads

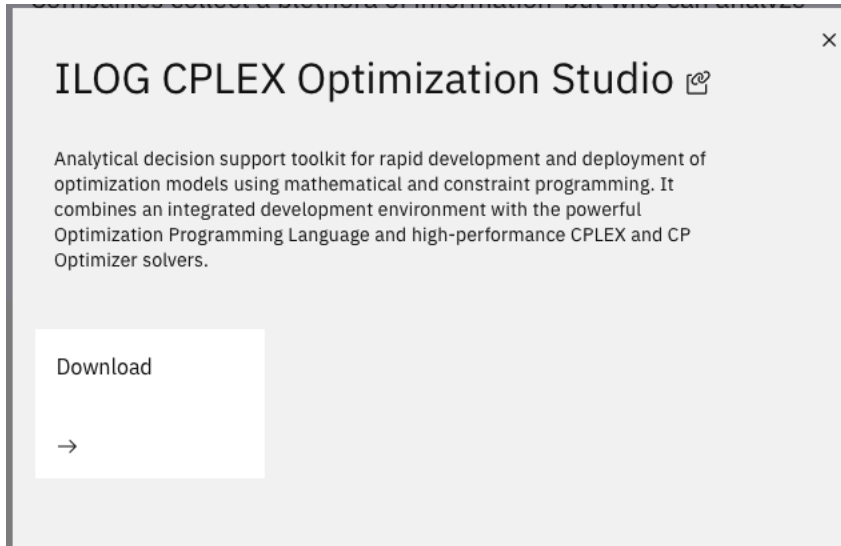
- All technologies
- Artificial Intelligence
- Capstone
- Data Science**
- IBM Automation
- IBM Cloud
- IBM Engineering
- IBM Security
- IBM Z
- Power Systems
- Quantum Computing
- Red Hat Academy

Data Science

Companies collect a plethora of information-but who can analyze and activate it? Data science experts can investigate trends, recommend actions, and help companies innovate. Build your expertise in this critical field with data science tools and softwares.

Software

ILOG CPLEX Optimization Studio	SPSS Modeler Premium	Cognos Analytics on Cloud
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You will be redirected to the [software download site](#). Type CJ6BPML in the part numbers field and choose HTTP then click search.

Search options

Text Brand **Part number**

Find by part number

Part numbers

CJ6BPML

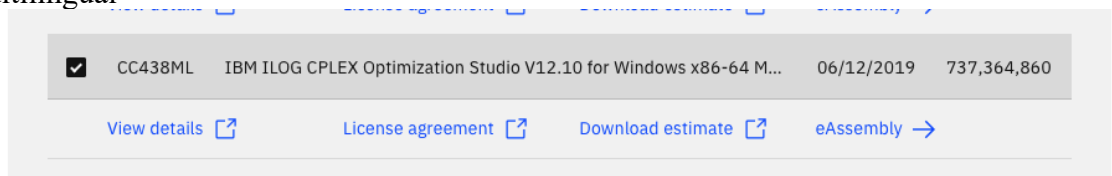
Enter single or multiple part numbers (separated by commas) and click Search. Example: CRPQ4EN, C47EHML.

Download method ⓘ

Download Director HTTP

Search

- 3- choose “IBM ILOG CPLEX Optimization Studio V12.10 for Windows x86-64 Multilingual”



- 4- Follow the installation instructions.

Note for Python users

- 1- Choose “IBM ILOG CPLEX Optimization Studio latest version
- 2- In the setup mode, follow the python instructions (See below for more details)

Gurobi solver

1- Access this website:

<https://www.gurobi.com/academia/academic-program-and-licenses/>

2- Get a Named-User License

The image shows three license options for Gurobi, each presented in a card format. The first card is for a 'Named-User License', which is 'FREE' and includes features like local installation, individual user design, and support for multiple models. The second card is for a 'Web License Service', also 'FREE' and marked as 'MOST FLEXIBLE', offering internet access, multi-machine use, and scalability. The third card is for a 'Site License*', which is 'FREE' and designed for large institutions, allowing deployment across all networked computers and consistent configuration. Each card has a red button to get the license or submit a ticket.

3- Follow Gurobi Instructions (Be sure to register with your EPFL email:

The image displays the instructions for obtaining a free Academic Named-User License. It starts with a note to get a free, unlimited-use Gurobi Optimizer license for a single person on a single machine. The instructions are as follows:

1. Register for a free Gurobi account as an academic and log in.
2. Visit the [Download Gurobi Optimizer](#) page and download the version you need, as well as the README.txt.
3. Follow the instructions in README.txt to install the software.
4. Once installed, visit the [Gurobi User Portal](#) to request your free Named-User License.
5. Next, run grbgetkey using the argument provided on the Academic License Detail page (ex: grbgetkey ae36ac20-16e6-acd2-f242-4da6e765fa0a). The grbgetkey program will prompt you to store the license file on your machine.

4- For Matlab Version 9.5.2 is needed

Gurobi Optimizer v9.5.2 [v9.5.2 Release Notes](#)

v9.5.2	Installer	md5 Checksum
x64 Windows	Gurobi-9.5.2-win64.msi	841be37f51c9e8333148530494281f0a
x64 Linux	gurobi9.5.2_linux64.tar.gz	6ea20f2f21a1779c2c2701a16030ed89
macOS Universal2	gurobi9.5.2_macos_universal2.pkg	a5ae480604065ad45615a68e9af3666a
x64 AIX	gurobi9.5.2_power64.tar.gz	b5546b4c3b492517bc003414d6412084
arm64 Linux	gurobi9.5.2_armlinux64.tar.gz	fefdb164bf5f9398ea8a11c31f6eaa80

Note: For Python users, Download the latest version

matTFA:

```
git clone https://github.com/EPFL-LCSB/matTFA.git
```

Adding paths in MATLAB:

```
First open MATLAB
Edit startup.m
Then Type this in the startup file
addpath(genpath('PathToYourCPLEX'))
addpath(genpath('PathToYourmatTFA'))
changeCobraSolver('cplexlp', 'LP')
```

Python Setup

Important Note: Primary Platform Support

This entire course is built around MATLAB packages and exercises. **Please follow the MATLAB installation tutorial first**, as this is our primary and fully supported platform. All course materials, examples, and exercises are designed for MATLAB, and we provide comprehensive support for MATLAB-related issues.

Python Alternative (Optional)

Some of the packages we use in this course are also available in Python. The Python installation tutorial provided below is offered as an **optional resource** for students who wish to:

- Reproduce course experiments in Python for learning purposes
- Explore Python implementations of the algorithms we cover
- Consider Python for their final project (only after confirming that all required libraries are available and compatible)

Python Exercise Versions

When feasible, we may provide Python versions of selected exercises alongside the main MATLAB versions. However, this will depend on library availability and compatibility for each specific exercise.

Recommendation

We strongly recommend starting with MATLAB to ensure you can fully participate in all course activities.

Recommended version: Python 3.10 with PIP as package manager or Anaconda

How to install Python: <https://realpython.com/installing-python/>

How to install PIP: <https://packaging.python.org/en/latest/tutorials/installing-packages/>

Install the following basic packages in your virtual environment:

- numpy
- pandas
- matplotlib
- seaborn
- scipy
- cobrapy (<https://github.com/opencobra/cobrapy>)
- pytfa (<https://github.com/EPFL-LCSB/pytfa>)

Gurobi solver installation: (pip is suggested) <https://support.gurobi.com/hc/en-us/articles/360044290292-How-do-I-install-Gurobi-for-Python>

Installing CPLEX solver:

Linux

1. Create a virtual env called venv

```
python -m venv venv
```

2. Activate venv

```
source venv/bin/activate
```

3. PIP installation (if not installed)

```
python -m pip install --upgrade pip
```

4. Install the following library

```
pip install python-libsmbml-experimental --only-binary :all:
```

5. Download cplex_studio2211.linux_x86_64 file and extract it if necessary

6. Run `sudo chmod +x ./yourPath/cplex_studio2211.linux_x86_64.bin &&`

```
sudo ./yourPath/cplex_studio2211.linux_x86_64.bin -DLICENSE_ACCEPTED=TRUE
```

7. Activate venv (if not)

```
source venv/bin/activate
```

8. Copy CPLEX installation to non-forbidden folders because of right-related issues when operating from virtual env

```
cp -r /opt/ibm/ILOG/CPLEX_Studio2211 /home/something/CPLEX_Studio2211
```

9. Install CPLEX in your venv

```
python /home/something/CPLEX_Studio2211/python/setup.py install
```

Windows and MAX

Similar pipeline, but you should install the .exe or .osx.bin version of CPLEX 2211 from the IBM website. (**See IBM ILOG Cplex section for more details**)