A Manual for installing FASTCORE, COBRA Toolbox V3 & IBM CPLEX 12.9 for Windows 10

Windows version: 10.0.19042 Build 19042

1- Installing MATLAB
Version: 2021b
MATLAB toolboxes are checked during installing:

> Bioinformatics Toolbox (required)
> Curve Fitting Toolbox (required)
> Optimization Toolbox
> Parallel Computing Toolbox
> Signal Processing Toolbox
> SimBiology
> Statistics and Machine Learning Toolbox
> Symbolic Math Toolbox

2- Installing CPLEX Optimization Studio 12.9 :
   1- Downloading CPLEX Optimization Studio 12.9 :
- Go to https://www.ibm.com/academic/topic/data-science
- Register an IBM account with an academic email.
- Go back to https://www.ibm.com/academic/topic/data-science, and sign in with your account.
- Scroll down then click on "Software" on the Left
- Click on the arrow below "ILOG CPLEX Optimization Studio"
- Click on "Download"
- Click on "Search for Software" on the left side.
- Search for "IBM ILOG CPLEX Optimization Studio 12.9.0 for Windows x86-64 Multilingual"
- Click on "HTTP", then click on the checkbox for the Windows version.
- Choose "I agree", then "Download Now"

   2- Install CPLEX pre-requisites:
     a. The latest Git for Windows:
       https://git-scm.com/download/win

     b. Visual Studio for Windows:
       https://visualstudio.microsoft.com/
     c. Oracle Java SDK/JRE/JDK

     For Windows pre-requisites, check: https://www.ibm.com/support/pages/detailed-system-requirements-ibm-ilog-cplex-optimization-studio#1290

   3- Install the CPLEX from the downloaded installer:
     So check the parent folder manually (C:\Program Files\IBM\ILOG\CPLEX_Studio129\cplex\bin\x64_win64), and if the @Cplex folder is missing, Please uninstall, then reinstall Cplex

Then run these lines in MATLAB to add the CPLEX path

```
> addpath(genpath('C:\Program
Files\IBM\ILOG\CPLEX_Studio129\cplex\matlab\x64_win64'))
> setenv('ILOG_CPLEX_PATH','C:\Program
Files\IBM\ILOG\CPLEX_Studio129\cplex\matlab\x64_win64')
```

If CPLEX is correctly installed, you should find "Cplex" command in MATLAB.

4- Installing COBRA Toolbox V3:

4.1. Run MATLAB as administrator

4.2. Double check that the setfield command has only this path
"/Applications/MATLAB_R2020a.app/toolbox/matlab/datatypes/setfield.m" by running:

```
> which -all setfield
```

If there are other paths, remove them such as these examples:

```
> rmpath('C:\Program Files\MATLAB\R2021b\toolbox\finance\ftseries\')
> rmpath('C:\Program Files\MATLAB\R2021b\toolbox\sl3d\sl3d\')
```

4.3. Download COBRA toolbox from https://github.com/opencobra/cobratoolbox either
using Git (Start > open Git Bash) then run
> git clone --depth=1 https://github.com/opencobra/cobratoolbox.git cobratoolbox
Or manually (not recommended):
> from « Code », click on "Download ZIP"

4.4. Add Cobratoolbox folder to paths using
➢ addpath(genpath('/PATH OF THE DOWNLOADED cobratoolbox/'))

4.5. From MATLAB, go to the downloaded "cobratoolbox" folder, then run
➢ initCobraToolbox.m

4.6 Check if CPLEX is correctly installed and detected by the COBRA Toolbox:

by finding this line during installation **"ibm_cplex   active   1   1   1   1"**
And also "changeCobraSolver('IBM_CPLEX')" should return logical 1

4.7. If MATLAB crashes and closes during installation, open MATLAB and run again the
initCobraToolbox.m and you might want to doublecheck that cobratoolbox is still added to
the path using which -all initcobratoolbox. If the command is not found, repeat step
4.4.

4.8 In case of failed installation, you may need to remove *cobratoolbox* and *cplex* paths, and
add them again using
```
% Restoring all default paths, please note this would remove paths for
other non-default MATLAB tools
restoredefaultpath
% Adding the CPLEX path
```

```
addpath(genpath('C:\Program
Files\IBM\ILOG\CPLEX_Studio129\cplex\matlab\x64_win64'))
setenv('ILOG_CPLEX_PATH','C:\Program
Files\IBM\ILOG\CPLEX_Studio129\cplex\matlab\x64_win64')
Cplex % should return Logical 1
% Checking if there is only this path for setfield command:
"/Applications/MATLAB_R2020a.app/toolbox/matlab/datatypes/setfield.m "
which -all setfield
% Saving permanently the new paths
savepath
```

5- Download FASTCORE:
   Either using Git Bash:
   ➢ git clone https://github.com/sysbiolux/rFASTCORMICS
   Or manually:
   from « Code », click on "Download ZIP"

   From MATLAB:
   ```
   addpath(genpath('/PATH OF THE DOWNLOADED rFASTCORMICS/'))
   ```

   If you are able to call the following functions (and more related functions) in the command window of MATLAB then the installation is done.

   - fastcc_fastcore   *(from the fastcore folder)*
   - fastcc_4_fastcormics *(from the fastcormics for microarray data folder)*
   - fastcormics_RNAseq   *(from the fastcormics for RNA-seq data folder)*