janpeter19 /
BPL_TEST2_Fedbatch

<> **Code**   Issues   Pull requests   Actions   Projects   Wiki   Security

main   **BPL_TEST2_Fedbatch** / **BPL_TEST2_Fedbatch_colab.ipynb**

janpeter19 Created using Colab   60913ae · now

3276 lines (3276 loc) · 356 KB

Preview   Code   Blame   Raw

CO Open in Colab

BPL_TEST2_Fedbatch script with PyFMI

The key library PyFMI is installed.

After the installation a small application BPL_TEST2_Fedbatch is loaded and run.
You can continue with this example if you like.

In [ ]:
```
!lsb_release -a # Actual VM Ubuntu version used by Google
```

```
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 22.04.3 LTS
Release:        22.04
Codename:       jammy
```

In [ ]:
```
%env PYTHONPATH=
```

```
env: PYTHONPATH=
```

In [ ]:
```
!wget https://repo.anaconda.com/miniconda/Miniconda3-py310_23.1.0-1-Lin
!chmod +x Miniconda3-py310_23.1.0-1-Linux-x86_64.sh
!bash ./Miniconda3-py310_23.1.0-1-Linux-x86_64.sh -b -f -p /usr/local
import sys
sys.path.append('/usr/local/lib/python3.10/site-packages/')
```

```
--2024-10-02 07:35:34--  https://repo.anaconda.com/miniconda/Miniconda3-
py310_23.1.0-1-Linux-x86_64.sh
Resolving repo.anaconda.com (repo.anaconda.com)... 104.16.32.241, 104.1
6.191.158, 2606:4700::6810:20f1, ...
Connecting to repo.anaconda.com (repo.anaconda.com)|104.16.32.241|:44
3... connected.
HTTP request sent, awaiting response... 200 OK
Length: 74403966 (71M) [application/x-sh]
Saving to: 'Miniconda3-py310_23.1.0-1-Linux-x86_64.sh'

Miniconda3-py310_23 100%[===================>]  70.96M   141MB/s    in
0.5s

2024-10-02 07:35:35 (141 MB/s) - 'Miniconda3-py310_23.1.0-1-Linux-x86_6
4.sh' saved [74403966/74403966]

PREFIX=/usr/local
Unpacking payload ...

Installing base environment...


Downloading and Extracting Packages


Downloading and Extracting Packages

Preparing transaction: - \ | / - \ done
Executing transaction: / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | /
- \ | / - \ | / - \ | / - \ | / - \ | / - \ done
```

installation finished.

In [ ]:
```
!conda update –n base –c defaults conda ––yes
```

Collecting package metadata (current_repodata.json): – \ | / – \ | / – \
| / – \ | / – \ | / – \ | / – \ | / – \ | / – \ | / – \ | / – \ | / – \
| / – \ | / – \ | / done
Solving environment: \ | / – \ | / – \ | / – \ | / – \ | / – \ | / – \ |
/ – \ | / – \ | / – \ | / – done

==> WARNING: A newer version of conda exists. <==
  current version: 23.1.0
  latest version: 24.9.0

Please update conda by running

    $ conda update –n base –c defaults conda

Or to minimize the number of packages updated during conda update use

     conda install conda=24.9.0

Package Plan

  environment location: /usr/local

  added / updated specs:
    – conda

The following packages will be downloaded:

package	build
brotli-python-1.0.9	py310h6a678d5_8 356 KB
bzip2-1.0.8	h5eee18b_6 262 KB
ca-certificates-2024.9.24	h06a4308_0 130 KB
certifi-2024.8.30	py310h06a4308_0 162 KB
cffi-1.17.1	py310h1fdaa30_0 255 KB
charset-normalizer-3.3.2	pyhd3eb1b0_0 44 KB
conda-package-handling-2.3.0| py310h06a4308_0   270 KB
conda-package-streaming-0.10.0| py310h06a4308_0   27 KB
cryptography-43.0.0	py310hdda0065_0 2.2 MB
idna-3.7	py310h06a4308_0 130 KB
ld_impl_linux-64-2.40	h12ee557_0 710 KB
libffi-3.4.4	h6a678d5_1 141 KB
lz4-c-1.9.4	h6a678d5_1 156 KB
openssl-3.0.15	h5eee18b_0 5.2 MB
pycosat-0.6.6	py310h5eee18b_1 93 KB
pyopenssl-24.2.1	py310h06a4308_0 97 KB
python-3.10.14	h955ad1f_1 26.8 MB
requests-2.32.3	py310h06a4308_0 100 KB
ruamel.yaml.clib-0.2.8	py310h5eee18b_0 157 KB
sqlite-3.45.3	h5eee18b_0 1.2 MB
tk-8.6.14	h39e8969_0 3.4 MB
tqdm-4.66.5	py310h2f386ee_0 134 KB
tzdata-2024a	h04d1e81_0 116 KB
urllib3-2.2.3	py310h06a4308_0 183 KB
xz-5.4.6	h5eee18b_1 643 KB
zlib-1.2.13	h5eee18b_1 111 KB
zstandard-0.22.0	py310h2c38b39_0 427 KB

```
  zstd-1.5.5                   |       hc292b87_2         643 KB
  ------------------------------------------------------------
                                          Total:        44.1 MB

The following NEW packages will be INSTALLED:

  brotli-python      pkgs/main/linux-64::brotli-python-1.0.9-py310h6a678
d5_8
  lz4-c              pkgs/main/linux-64::lz4-c-1.9.4-h6a678d5_1
  zstd               pkgs/main/linux-64::zstd-1.5.5-hc292b87_2

The following packages will be REMOVED:

  brotlipy-0.7.0-py310h7f8727e_1002

The following packages will be UPDATED:

  bzip2                           1.0.8-h7b6447c_0  --> 1.0.8-h5
eee18b_6
  ca-certificates            2023.01.10-h06a4308_0  --> 2024.9.2
4-h06a4308_0
  certifi                 2022.12.7-py310h06a4308_0  --> 2024.8.3
0-py310h06a4308_0
  cffi                       1.15.1-py310h5eee18b_3  --> 1.17.1-p
y310h1fdaa30_0
  charset-normalizer          2.0.4-pyhd3eb1b0_0  --> 3.3.2-py
hd3eb1b0_0
  conda-package-han~       2.0.2-py310h06a4308_0  --> 2.3.0-py
310h06a4308_0
  conda-package-str~       0.7.0-py310h06a4308_0  --> 0.10.0-p
y310h06a4308_0
  cryptography              38.0.4-py310h9ce1e76_0  --> 43.0.0-p
y310hdda0065_0
  idna                        3.4-py310h06a4308_0  --> 3.7-py31
0h06a4308_0
  ld_impl_linux-64            2.38-h1181459_1  --> 2.40-h12
ee557_0
  libffi                      3.4.2-h6a678d5_6  --> 3.4.4-h6
a678d5_1
  openssl                     1.1.1s-h7f8727e_0  --> 3.0.15-h
5eee18b_0
  pycosat                    0.6.4-py310h5eee18b_0  --> 0.6.6-py
310h5eee18b_1
  pyopenssl          pkgs/main/noarch::pyopenssl-22.0.0-py~  --> pkgs/mai
n/linux-64::pyopenssl-24.2.1-py310h06a4308_0
  python                     3.10.9-h7a1cb2a_0  --> 3.10.14-
h955ad1f_1
  requests                  2.28.1-py310h06a4308_0  --> 2.32.3-p
y310h06a4308_0
  ruamel.yaml.clib           0.2.6-py310h5eee18b_1  --> 0.2.8-py
310h5eee18b_0
  sqlite                     3.40.1-h5082296_0  --> 3.45.3-h
5eee18b_0
  tk                         8.6.12-h1ccaba5_0  --> 8.6.14-h
39e8969_0
  tqdm                      4.64.1-py310h06a4308_0  --> 4.66.5-p
y310h2f386ee_0
  tzdata                     2022g-h04d1e81_0  --> 2024a-h0
4d1e81_0
  urllib3                  1.26.14-py310h06a4308_0  --> 2.2.3-py
310h06a4308_0
  xz                         5.2.10-h5eee18b_1  --> 5.4.6-h5
eee18b_1
  zlib                       1.2.13-h5eee18b_0  --> 1.2.13-h
```

```
5eee18b_1
  zstandard                                   0.18.0-py310h5eee18b_0 --> 0.22.0-p
y310h2c38b39_0



Downloading and Extracting Packages
tzdata-2024a          | 116 KB    | :    0% 0/1 [00:00<?, ?it/s]
ld_impl_linux-64-2.4  | 710 KB    | :    0% 0/1 [00:00<?, ?it/s]

ruamel.yaml.clib-0.2  | 157 KB    | :    0% 0/1 [00:00<?, ?it/s]


certifi-2024.8.30     | 162 KB    | :    0% 0/1 [00:00<?, ?it/s]



ca-certificates-2024  | 130 KB    | :    0% 0/1 [00:00<?, ?it/s]




tk-8.6.14             | 3.4 MB    | :    0% 0/1 [00:00<?, ?it/s]




zstandard-0.22.0      | 427 KB    | :    0% 0/1 [00:00<?, ?it/s]





conda-package-stream  | 27 KB     | :    0% 0/1 [00:00<?, ?it/s]






idna-3.7              | 130 KB    | :    0% 0/1 [00:00<?, ?it/s]







openssl-3.0.15        | 5.2 MB    | :    0% 0/1 [00:00<?, ?it/s]







brotli-python-1.0.9   | 356 KB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
urllib3-2.2.3          | 183 KB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
pyopenssl-24.2.1       | 97 KB     | :    0% 0/1 [00:00<?, ?it/s]
```

```
conda-package-handli   | 270 KB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
sqlite-3.45.3          | 1.2 MB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
zstd-1.5.5             | 643 KB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
cryptography-43.0.0  | 2.2 MB    | :   0% 0/1 [00:00<?, ?it/s]
```

```
xz-5.4.6             | 643 KB    | :   0% 0/1 [00:00<?, ?it/s]
```

```
cffi-1.17.1          | 255 KB    | :   0% 0/1 [00:00<?, ?it/s]
```

```
    tzdata-2024a        | 116 KB    | :    28% 0.27520177376143246/1 [00:00<0
0:00,  2.63it/s]

    ruamel.yaml.clib-0.2 | 157 KB   | :    10% 0.10168565825078821/1 [00:00<0
0:01,  1.28s/it]



    ca-certificates-2024 | 130 KB   | :    12% 0.12323429860849944/1 [00:00<0
0:00,  1.03s/it]
    ld_impl_linux-64-2.4 | 710 KB   | :     2% 0.022543831405604585/1 [00:00<
00:06,  6.25s/it]



    certifi-2024.8.30   | 162 KB    | :    10% 0.09853141049542344/1 [00:00<0
0:01,  1.36s/it]




    tk-8.6.14           | 3.4 MB    | :     0% 0.004570887819074975/1 [00:00<
00:29, 29.28s/it]




    conda-package-stream | 27 KB    | :    59% 0.5925497287522604/1 [00:00<0
0:00,  2.97it/s]




    zstandard-0.22.0    | 427 KB    | :     4% 0.03749954224191599/1 [00:00<0
0:05,  5.51s/it]




    idna-3.7            | 130 KB    | :    12% 0.12352324731036875/1 [00:00<0
0:01,  1.68s/it]




    openssl-3.0.15      | 5.2 MB    | :     0% 0.0030007460830410892/1 [00:00<
01:18, 78.43s/it]




    tk-8.6.14           | 3.4 MB    | :    38% 0.37938368898322294/1 [00:00<0
0:00,  1.88it/s]
```

```
0:00,  1.88it/s]



urllib3-2.2.3       | 183 KB    | :   9% 0.08740743902178784/1 [00:00<0
0:02,  2.89s/it]



brotli-python-1.0.9 | 356 KB    | :   4% 0.0449029259255199/1 [00:00<0
0:05,  5.96s/it]



pyopenssl-24.2.1    | 97 KB     | :  16% 0.16497668938989637/1 [00:00<0
0:01,  1.73s/it]



conda-package-handli | 270 KB   | :   6% 0.059350061762607/1 [00:00<00:
04,  5.22s/it]



openssl-3.0.15      | 5.2 MB    | :  19% 0.19247749314629709/1 [00:00<0
0:01,  1.38s/it]
```

```
tk-8.6.14             | 3.4 MB    | :  69% 0.6947749484993962/1 [00:00<0
0:00,  2.35it/s]

ruamel.yaml.clib-0.2 | 157 KB    | : 100% 1.0/1 [00:00<00:00,  3.00it/s]

ruamel.yaml.clib-0.2 | 157 KB    | : 100% 1.0/1 [00:00<00:00,  3.00it/s]
```

```
zstd-1.5.5            | 643 KB    | :   2% 0.024900036626640788/1 [00:00<
00:13, 13.92s/it]
```

```
sqlite-3.45.3         | 1.2 MB    | :   1% 0.012744531418334731/1 [00:00<
00:26, 27.05s/it]
```

```
cryptography-43.0.0   | 2.2 MB    | :   1% 0.0071148352827044015/1 [00:00
<00:55, 55.62s/it]
```

```
xz-5.4.6             | 643 KB    | :   2% 0.02486413806395413/1 [00:00<0
0:17, 17.44s/it]




openssl-3.0.15       | 5.2 MB    | :  41% 0.40600721210547036/1 [00:00<0
0:00,  1.17it/s]


ca-certificates-2024 | 130 KB    | : 100% 1.0/1 [00:00<00:00,  2.12it/s]


ca-certificates-2024 | 130 KB    | : 100% 1.0/1 [00:00<00:00,  2.12it/s]




cffi-1.17.1          | 255 KB    | :   6% 0.06285413957271155/1 [00:00<0
0:07,  7.75s/it]




  ... (more hidden) ...
```

```
cryptography-43.0.0  | 2.2 MB   | :  71% 0.7114835282704401/1 [00:00<0
0:00,  1.86it/s]
```

```
openssl-3.0.15       | 5.2 MB   | :  62% 0.6225443918950546/1 [00:00<0
0:00,  1.47it/s]
```

```
openssl-3.0.15       | 5.2 MB   | :  88% 0.8781785624799804/1 [00:00<0
0:00,  1.80it/s]
```

```
certifi-2024.8.30    | 162 KB   | : 100% 1.0/1 [00:00<00:00,  1.53it/s]
```

```
certifi-2024.8.30    | 162 KB   | : 100% 1.0/1 [00:00<00:00,  1.53it/s]
ld_impl_linux-64-2.4 | 710 KB   | : 100% 1.0/1 [00:00<00:00,  1.26it/s]
ld_impl_linux-64-2.4 | 710 KB   | : 100% 1.0/1 [00:00<00:00,  1.26it/s]
```

```
conda-package-stream | 27 KB    | : 100% 1.0/1 [00:00<00:00,  1.04s/it]
```

```
conda-package-stream | 27 KB    | : 100% 1.0/1 [00:00<00:00,  1.04s/it]
```

```
idna-3.7            | 130 KB     | : 100% 1.0/1 [00:00<00:00,  1.05it/s]




idna-3.7            | 130 KB     | : 100% 1.0/1 [00:00<00:00,  1.05it/s]




zstandard-0.22.0    | 427 KB     | : 100% 1.0/1 [00:01<00:00,  1.02s/it]




zstandard-0.22.0    | 427 KB     | : 100% 1.0/1 [00:01<00:00,  1.02s/it]




urllib3-2.2.3       | 183 KB     | : 100% 1.0/1 [00:01<00:00,  1.18s/it]




urllib3-2.2.3       | 183 KB     | : 100% 1.0/1 [00:01<00:00,  1.18s/it]




brotli-python-1.0.9 | 356 KB     | : 100% 1.0/1 [00:01<00:00,  1.28s/it]




brotli-python-1.0.9 | 356 KB     | : 100% 1.0/1 [00:01<00:00,  1.28s/it]
```

```
pyopenssl-24.2.1     | 97 KB     | : 100% 1.0/1 [00:01<00:00,  1.40s/it]



tzdata-2024a         | 116 KB    | : 100% 1.0/1 [00:01<00:00,  1.56s/it]



conda-package-handli | 270 KB    | : 100% 1.0/1 [00:01<00:00,  1.44s/it]



conda-package-handli | 270 KB    | : 100% 1.0/1 [00:01<00:00,  1.44s/it]



zstd-1.5.5           | 643 KB    | : 100% 1.0/1 [00:01<00:00,  1.47s/it]
```

```
zstd-1.5.5           | 643 KB   | : 100% 1.0/1 [00:01<00:00,  1.47s/it]
```

```
sqlite-3.45.3        | 1.2 MB   | : 100% 1.0/1 [00:01<00:00,  1.50s/it]
```

```
sqlite-3.45.3        | 1.2 MB   | : 100% 1.0/1 [00:01<00:00,  1.50s/it]
```

```
xz-5.4.6             | 643 KB   | : 100% 1.0/1 [00:01<00:00,  1.78s/it]
```

```
xz-5.4.6              | 643 KB    | : 100% 1.0/1 [00:01<00:00,  1.78s/it]
```

... (more hidden) ...

... (more hidden) ...

```
        cffi-1.17.1         | 255 KB    | : 100% 1.0/1 [00:02<00:00,  1.95s/it]
```

```
        cffi-1.17.1         | 255 KB    | : 100% 1.0/1 [00:02<00:00,  1.95s/it]
```

```
        tk-8.6.14           | 3.4 MB    | : 100% 1.0/1 [00:02<00:00,  2.96s/it]
```

```
        tk-8.6.14           | 3.4 MB    | : 100% 1.0/1 [00:02<00:00,  2.96s/it]
```

```
        cryptography-43.0.0 | 2.2 MB    | : 100% 1.0/1 [00:02<00:00,  1.86it/s]
```

```
        openssl-3.0.15      | 5.2 MB    | : 100% 1.0/1 [00:03<00:00,  1.80it/s]
```

```
Preparing transaction: | / done
Verifying transaction: \ | / - \ | / - \ | / - done
Executing transaction: | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ |
done
```

In [ ]:

```
!conda --version
!python --version
```

```
conda 23.1.0
Python 3.10.14
```

In [ ]:

```
!conda install -c conda-forge pyfmi --yes # Install the key package
```

```
Collecting package metadata (current_repodata.json): - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \
| / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ done
Solving environment: / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
```

```
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / - \ | / -
\ | / - \ | / - \ | / - \ | / - \ | / - \ | / - done


    ==> WARNING: A newer version of conda exists. <==
      current version: 23.1.0
      latest version: 24.9.0

    Please update conda by running

        $ conda update -n base -c defaults conda

    Or to minimize the number of packages updated during conda update use

         conda install conda=24.9.0



    ## Package Plan ##

      environment location: /usr/local

      added / updated specs:
        - pyfmi


    The following packages will be downloaded:

        package                    |                build
        ---------------------------|-----------------
        _libgcc_mutex-0.1          |          conda_forge           3 KB   conda-
    forge
        _openmp_mutex-4.5          |            2_kmp_llvm           6 KB   conda-
    forge
        assimulo-3.5.2             |      py310h9eb1050_1          2.1 MB   conda-
    forge
        ca-certificates-2024.8.30  |          hbcca054_0           155 KB   conda-
    forge
        certifi-2024.8.30          |         pyhd8ed1ab_0          160 KB   conda-
    forge
        fmilib-2.4.1               |            hac33072_1          383 KB   conda-
    forge
        gmp-6.3.0                  |            hac33072_2          449 KB   conda-
    forge
        icu-73.2                   |            h59595ed_0         11.5 MB   conda-
    forge
        libblas-3.9.0              |24_linux64_openblas            15 KB   cond
    a-forge
        libcblas-3.9.0             |24_linux64_openblas            15 KB   cond
    a-forge
        libgcc-14.1.0              |            h77fa898_1          827 KB   conda-
    forge
        libgcc-ng-14.1.0           |            h69a702a_1           51 KB   conda-
    forge
        libgfortran-14.1.0         |            h69a702a_1           51 KB   conda-
    forge
        libgfortran-ng-14.1.0      |            h69a702a_1           51 KB   conda-
    forge
        libgfortran5-14.1.0        |            hc5f4f2c_1          1.4 MB   conda-
    forge
        libhwloc-2.11.1            |default_hecaa2ac_1000           2.3 MB   co
    nda-forge
        liblapack-3.9.0            |24_linux64_openblas            15 KB   cond
    a-forge
        libopenblas-0.3.27         |pthreads_hac2b453_1            5.3 MB   cond
```

```
a-forge
    libstdcxx-14.1.0              |        hc0a3c3a_1         3.7 MB    conda-
forge
    libstdcxx-ng-14.1.0          |        h4852527_1          51 KB    conda-
forge
    libxml2-2.13.1               |        hfdd30dd_2         739 KB
    llvm-openmp-19.1.0           |        h84d6215_0         3.1 MB    conda-
forge
    metis-5.1.0                  |      h59595ed_1007        3.7 MB    conda-
forge
    mpfr-4.2.1                   |        h90cbb55_3         620 KB    conda-
forge
    numpy-2.1.1                  |     py310hd6e36ab_0       7.4 MB    conda-
forge
    openssl-3.3.2                |        hb9d3cd8_0         2.8 MB    conda-
forge
    pyfmi-2.14.0                 |     py310hf462985_1      12.0 MB    conda-
forge
    python_abi-3.10              |         2_cp310            4 KB    conda-
forge
    scipy-1.14.1                 |     py310ha3fb0e1_0      16.1 MB    conda-
forge
    suitesparse-7.8.2            |        hb42a789_0         1.8 MB    conda-
forge
    sundials-7.1.1               |        ha52427a_0         907 KB    conda-
forge
    tbb-2021.13.0                |        h84d6215_0         172 KB    conda-
forge
    ------------------------------------------------------------
                                            Total:          77.7 MB

The following NEW packages will be INSTALLED:

  assimulo          conda-forge/linux-64::assimulo-3.5.2-py310h9eb1050_
1
  fmilib            conda-forge/linux-64::fmilib-2.4.1-hac33072_1
  gmp               conda-forge/linux-64::gmp-6.3.0-hac33072_2
  icu               conda-forge/linux-64::icu-73.2-h59595ed_0
  libblas           conda-forge/linux-64::libblas-3.9.0-24_linux64_open
blas
  libcblas          conda-forge/linux-64::libcblas-3.9.0-24_linux64_ope
nblas
  libgcc            conda-forge/linux-64::libgcc-14.1.0-h77fa898_1
  libgfortran       conda-forge/linux-64::libgfortran-14.1.0-h69a702a_1
  libgfortran-ng    conda-forge/linux-64::libgfortran-ng-14.1.0-h69a702
a_1
  libgfortran5      conda-forge/linux-64::libgfortran5-14.1.0-hc5f4f2c_
1
  libhwloc          conda-forge/linux-64::libhwloc-2.11.1-default_hecaa
2ac_1000
  liblapack         conda-forge/linux-64::liblapack-3.9.0-24_linux64_op
enblas
  libopenblas       conda-forge/linux-64::libopenblas-0.3.27-pthreads_h
ac2b453_1
  libstdcxx         conda-forge/linux-64::libstdcxx-14.1.0-hc0a3c3a_1
  libxml2           pkgs/main/linux-64::libxml2-2.13.1-hfdd30dd_2
  llvm-openmp       conda-forge/linux-64::llvm-openmp-19.1.0-h84d6215_0
  metis             conda-forge/linux-64::metis-5.1.0-h59595ed_1007
  mpfr              conda-forge/linux-64::mpfr-4.2.1-h90cbb55_3
  numpy             conda-forge/linux-64::numpy-2.1.1-py310hd6e36ab_0
  pyfmi             conda-forge/linux-64::pyfmi-2.14.0-py310hf462985_1
  python_abi        conda-forge/linux-64::python_abi-3.10-2_cp310
  scipy             conda-forge/linux-64::scipy-1.14.1-py310ha3fb0e1_0
  suitesparse       conda-forge/linux-64::suitesparse-7.8.2-hb42a789_0
  sundials          conda-forge/linux-64::sundials-7.1.1-ha52427a_0
```

```
sundials              conda-forge/linux-64::sundials-7.1.1-ha52427a_0
tbb                   conda-forge/linux-64::tbb-2021.13.0-h84d6215_0

The following packages will be REMOVED:

  libgomp-11.2.0-h1234567_1

The following packages will be UPDATED:

  libgcc-ng           pkgs/main::libgcc-ng-11.2.0-h1234567_1 --> conda-fo
rge::libgcc-ng-14.1.0-h69a702a_1
  libstdcxx-ng        pkgs/main::libstdcxx-ng-11.2.0-h12345~ --> conda-fo
rge::libstdcxx-ng-14.1.0-h4852527_1
  openssl             pkgs/main::openssl-3.0.15-h5eee18b_0 --> conda-fo
rge::openssl-3.3.2-hb9d3cd8_0

The following packages will be SUPERSEDED by a higher-priority channel:

  _libgcc_mutex        pkgs/main::_libgcc_mutex-0.1-main --> conda-fo
rge::_libgcc_mutex-0.1-conda_forge
  _openmp_mutex        pkgs/main::_openmp_mutex-5.1-1_gnu --> conda-fo
rge::_openmp_mutex-4.5-2_kmp_llvm
  ca-certificates     pkgs/main::ca-certificates-2024.9.24-~ --> conda-fo
rge::ca-certificates-2024.8.30-hbcca054_0
  certifi             pkgs/main/linux-64::certifi-2024.8.30~ --> conda-fo
rge/noarch::certifi-2024.8.30-pyhd8ed1ab_0


Downloading and Extracting Packages
libblas-3.9.0        | 15 KB     | :    0% 0/1 [00:00<?, ?it/s]
mpfr-4.2.1           | 620 KB    | :    0% 0/1 [00:00<?, ?it/s]

libopenblas-0.3.27   | 5.3 MB    | :    0% 0/1 [00:00<?, ?it/s]

tbb-2021.13.0        | 172 KB    | :    0% 0/1 [00:00<?, ?it/s]

sundials-7.1.1       | 907 KB    | :    0% 0/1 [00:00<?, ?it/s]

libgcc-ng-14.1.0     | 51 KB     | :    0% 0/1 [00:00<?, ?it/s]

_openmp_mutex-4.5    | 6 KB      | :    0% 0/1 [00:00<?, ?it/s]

numpy-2.1.1          | 7.4 MB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
libstdcxx-14.1.0    | 3.7 MB    | :    0% 0/1 [00:00<?, ?it/s]




metis-5.1.0         | 3.7 MB    | :    0% 0/1 [00:00<?, ?it/s]




assimulo-3.5.2      | 2.1 MB    | :    0% 0/1 [00:00<?, ?it/s]




libgfortran5-14.1.0 | 1.4 MB    | :    0% 0/1 [00:00<?, ?it/s]




icu-73.2            | 11.5 MB   | :    0% 0/1 [00:00<?, ?it/s]




libgfortran-ng-14.1. | 51 KB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
libgfortran-14.1.0   | 51 KB      | :     0% 0/1 [00:00<?, ?it/s]
```

```
scipy-1.14.1         | 16.1 MB    | :     0% 0/1 [00:00<?, ?it/s]
```

```
libhwloc-2.11.1      | 2.3 MB     | :     0% 0/1 [00:00<?, ?it/s]
```

```
ca-certificates-2024 | 155 KB     | :     0% 0/1 [00:00<?, ?it/s]
```

```
libgcc-14.1.0        | 827 KB    | :    0% 0/1 [00:00<?, ?it/s]
```

```
 ... (more hidden) ...
mpfr-4.2.1           | 620 KB    | :    3% 0.025811696239942908/1 [00:00<
00:03,  4.04s/it]

libopenblas-0.3.27   | 5.3 MB    | :    1% 0.0088354362253963679/1 [00:00<
00:11, 11.32s/it]


libblas-3.9.0        | 15 KB     | : 100% 1.0/1 [00:00<00:00,  7.89it/s]


sundials-7.1.1       | 907 KB    | :    2% 0.01763373830085844/1 [00:00<0
0:06,  7.11s/it]


libgcc-ng-14.1.0     | 51 KB     | :   31% 0.31405022043319913/1 [00:00<0
0:00,  2.51it/s]


_openmp_mutex-4.5    | 6 KB      | : 100% 1.0/1 [00:00<00:00,  5.91it/s]
libopenblas-0.3.27   | 5.3 MB    | :   20% 0.19732474236718578/1 [00:00<0
0:00,  1.14it/s]


libstdcxx-14.1.0     | 3.7 MB    | :    0% 0.004208816267855808/1 [00:00<
00:47, 47.25s/it]
```

```
numpy-2.1.1          | 7.4 MB    | :   0% 0.0020979917337793958/1 [00:00
<01:36, 96.23s/it]

tbb-2021.13.0        | 172 KB    | : 100% 1.0/1 [00:00<00:00,  4.78it/s]

tbb-2021.13.0        | 172 KB    | : 100% 1.0/1 [00:00<00:00,  4.78it/s]




assimulo-3.5.2       | 2.1 MB    | :   1% 0.007504628556614049/1 [00:00<
00:32, 32.56s/it]




metis-5.1.0          | 3.7 MB    | :   0% 0.004211540453691692/1 [00:00<
01:02, 62.95s/it]

libopenblas-0.3.27   | 5.3 MB    | :  45% 0.45355239290368077/1 [00:00<0
0:00,  1.78it/s]




numpy-2.1.1          | 7.4 MB    | :  14% 0.1405654461632195/1 [00:00<0
0:01,  1.74s/it]




libstdcxx-14.1.0     | 3.7 MB    | :  45% 0.45034334066057147/1 [00:00<0
0:00,  1.81it/s]




assimulo-3.5.2       | 2.1 MB    | :  69% 0.6904258272084925/1 [00:00<0
```

```
0:00,  2.48it/s]
```

```
metis-5.1.0          | 3.7 MB   | :   28% 0.2779616699436516/1 [00:00<0
0:00,  1.03s/it]

libopenblas-0.3.27   | 5.3 MB   | :   70% 0.6979994618063139/1 [00:00<0
0:00,  2.04it/s]

numpy-2.1.1          | 7.4 MB   | :   33% 0.3314826939371445/1 [00:00<0
0:00,  1.06it/s]

libstdcxx-14.1.0     | 3.7 MB   | :   79% 0.7870486420890361/1 [00:00<0
0:00,  2.38it/s]

libgfortran5-14.1.0  | 1.4 MB   | :    1% 0.011222386688758914/1 [00:00<
00:39, 39.44s/it]

metis-5.1.0          | 3.7 MB   | :   65% 0.6485772298685205/1 [00:00<0
0:00,  1.88it/s]

libopenblas-0.3.27   | 5.3 MB   | :   95% 0.9542271123428089/1 [00:00<0
0:00,  2.23it/s]
```

```
icu-73.2              | 11.5 MB    | :    0% 0.0013552648449229267/1 [00:00
<06:09, 370.23s/it]
```

```
numpy-2.1.1           | 7.4 MB     | :   54% 0.5391838755813047/1 [00:00<0
0:00,  1.41it/s]
```

```
metis-5.1.0           | 3.7 MB     | :  100% 0.9981350875249309/1 [00:00<0
0:00,  2.39it/s]
```

```
libgcc-ng-14.1.0      | 51 KB      | :  100% 1.0/1 [00:00<00:00,  1.68it/s]
```

```
libgcc-ng-14.1.0      | 51 KB      | :  100% 1.0/1 [00:00<00:00,  1.68it/s]
```

```
libgfortran-ng-14.1.  | 51 KB      | :   31% 0.3137975944227381/1 [00:00<0
0:01,  1.85s/it]
```

```
libgfortran-14.1.0    | 51 KB      | :   31% 0.31421886387173487/1 [00:00<0
0:01,  1.86s/it]
mpfr-4.2.1            | 620 KB     | :  100% 1.0/1 [00:00<00:00,  1.71it/s]
mpfr-4.2.1            | 620 KB     | :  100% 1.0/1 [00:00<00:00,  1.71it/s]
```

```
icu-73.2              | 11.5 MB   | :   12% 0.12061857119814048/1 [00:00<0
0:03,  3.76s/it]
```

```
numpy-2.1.1           | 7.4 MB    | :   77% 0.774158949764597/1 [00:00<00:
00,  1.71it/s]
```

```
scipy-1.14.1          | 16.1 MB   | :    0% 0.0009690655514526549/1 [00:00
<10:29, 630.17s/it]
```

```
libhwloc-2.11.1       | 2.3 MB    | :    1% 0.006775948690716653/1 [00:00<
01:32, 93.10s/it]
```

```
ca-certificates-2024 | 155 KB   | :  10% 0.10304208096702577/1 [00:00<0
0:05,  6.13s/it]
```

```
_openmp_mutex-4.5    | 6 KB     | : 100% 1.0/1 [00:00<00:00,  5.91it/s]
```

```
icu-73.2             | 11.5 MB  | :  22% 0.22090816972243707/1 [00:00<0
0:01,  2.27s/it]
```

```
libgcc-14.1.0        | 827 KB   | :   2% 0.019357735296202265/1 [00:00<0
0:35, 36.32s/it]
```

```
numpy-2.1.1          | 7.4 MB   | :  96% 0.9608802140709631/1 [00:00<0
0:00,  1.74it/s]
```

```
scipy-1.14.1          | 16.1 MB   | :    7% 0.06783458860168584/1 [00:00<0
0:07,  7.82s/it]
```

```
libhwloc-2.11.1       | 2.3 MB    | :   68% 0.6775948690716652/1 [00:00<0
0:00,  1.25it/s]
```

```
  ... (more hidden) ...
```

```
icu-73.2              | 11.5 MB   | :   37% 0.37134256750888195/1 [00:00<0
0:00,  1.41s/it]
```

```
scipy−1.14.1          | 16.1 MB   | :  14% 0.14245263606354028/1 [00:00<0
0:03,  3.86s/it]
```

```
 ... (more hidden) ...
```

```
icu−73.2              | 11.5 MB   | :  48% 0.481119019947639/1 [00:00<00:
00,  1.25s/it]
```

```
scipy−1.14.1          | 16.1 MB   | :  21% 0.21319442131958408/1 [00:00<0
0:02,  2.76s/it]
```

```
 ... (more hidden) ...




        scipy-1.14.1           | 16.1 MB   | :  27% 0.2742455510611013/1 [00:01<0
        0:01,  2.45s/it]




        icu-73.2               | 11.5 MB   | :  59% 0.5881849426965502/1 [00:01<0
        0:00,  1.28s/it]




        scipy-1.14.1           | 16.1 MB   | :  34% 0.3440182707656925/1 [00:01<0
        0:01,  2.11s/it]




        icu-73.2               | 11.5 MB   | :  68% 0.684408746686078/1 [00:01<00:
        00,  1.30s/it]
```

```
scipy-1.14.1          | 16.1 MB   | :   42% 0.41863631822754693/1 [00:01<0
0:01,  1.87s/it]
```

```
icu-73.2              | 11.5 MB   | :   78% 0.7846983452103746/1 [00:01<0
0:00,  1.21s/it]
```

```
scipy-1.14.1          | 16.1 MB   | :   50% 0.5000378245495699/1 [00:01<0
0:00,  1.66s/it]
```

```
icu-73.2              | 11.5 MB   | :   88% 0.8768563546651336/1 [00:01<0
0:00,  1.18s/it]
```

```
scipy-1.14.1         | 16.1 MB   | :  59% 0.5862846586288563/1 [00:01<0
0:00,  1.58s/it]
```

```
icu-73.2             | 11.5 MB   | :  98% 0.9825670125691219/1 [00:01<0
0:00,  1.12s/it]
```

```
scipy-1.14.1         | 16.1 MB   | :  71% 0.7083869181118908/1 [00:01<0
0:00,  1.31s/it]
```

```
sundials-7.1.1       | 907 KB    | : 100% 1.0/1 [00:01<00:00,  1.65s/it]
```

```
sundials-7.1.1       | 907 KB    | : 100% 1.0/1 [00:01<00:00,  1.65s/it]
```

```
scipy-1.14.1         | 16.1 MB   | :  85% 0.8459942264181678/1 [00:01<0
0:00,  1.11s/it]
```

```
scipy-1.14.1          | 16.1 MB    | :   97% 0.9748799447613709/1 [00:01<0
0:00,  1.00it/s]
```

```
assimulo-3.5.2        | 2.1 MB     | : 100% 1.0/1 [00:01<00:00,  2.48it/s]
```

```
libstdcxx-14.1.0      | 3.7 MB     | : 100% 1.0/1 [00:02<00:00,  2.38it/s]
```

```
libgfortran5-14.1.0   | 1.4 MB     | : 100% 1.0/1 [00:02<00:00,  2.31s/it]
```

```
libgfortran5-14.1.0   | 1.4 MB     | : 100% 1.0/1 [00:02<00:00,  2.31s/it]
libopenblas-0.3.27    | 5.3 MB     | : 100% 1.0/1 [00:02<00:00,  2.23it/s]
```

```
libgfortran-ng-14.1. | 51 KB    | : 100% 1.0/1 [00:02<00:00,  2.68s/it]
```

```
libgfortran-ng-14.1. | 51 KB    | : 100% 1.0/1 [00:02<00:00,  2.68s/it]
```

```
metis-5.1.0          | 3.7 MB   | : 100% 1.0/1 [00:02<00:00,  2.39it/s]
```

```
libgfortran-14.1.0   | 51 KB    | : 100% 1.0/1 [00:02<00:00,  2.79s/it]
```

```
libgfortran-14.1.0   | 51 KB    | : 100% 1.0/1 [00:02<00:00,  2.79s/it]
```

```
ca-certificates-2024 | 155 KB    | : 100% 1.0/1 [00:02<00:00,  2.61s/it]
```

```
ca-certificates-2024 | 155 KB    | : 100% 1.0/1 [00:02<00:00,  2.61s/it]
```

```
libgcc-14.1.0        | 827 KB    | : 100% 1.0/1 [00:02<00:00,  2.70s/it]
```

```
libgcc-14.1.0        | 827 KB    | : 100% 1.0/1 [00:02<00:00,  2.70s/it]
```

```
libhwloc-2.11.1      | 2.3 MB    | : 100% 1.0/1 [00:03<00:00,  1.25it/s]



numpy-2.1.1          | 7.4 MB    | : 100% 1.0/1 [00:04<00:00,  1.74it/s]




   ... (more hidden) ...




icu-73.2             | 11.5 MB   | : 100% 1.0/1 [00:05<00:00,  1.12s/it]




scipy-1.14.1         | 16.1 MB   | : 100% 1.0/1 [00:06<00:00,  1.00it/s]
```

```
Preparing transaction: | / done
Verifying transaction: \ | / - \ | done
Executing transaction: - \ | / - \ | / - \ | / - \ | / - \ | / - \ | don
e
```

BPL_TEST2_Fedbatch setup

Now specific installation and the run simulations. Start with connecting to Github.
Then upload the two files:

- FMU - BPL_TEST2_Fedbatch_linux_om_me.fmu
- Setup-file - BPL_TEST2_Fedbatch_explore.me.py

In [ ]:
```bash
%%bash
git clone https://github.com/janpeter19/BPL_TEST2_Fedbatch
```

```
Cloning into 'BPL_TEST2_Fedbatch'...
```

In [ ]:
```
%cd BPL_TEST2_Fedbatch
```

```
/content/BPL_TEST2_Fedbatch
```

In [ ]:
```
run -i BPL_TEST2_Fedbatch_explore.py
```

```
Linux - run FMU pre-comiled OpenModelica

Model for bioreactor has been setup. Key commands:
 - par()       - change of parameters and initial values
 - init()      - change initial values only
 - simu()      - simulate and plot
 - newplot()   - make a new plot
 - show()      - show plot from previous simulation
 - disp()      - display parameters and initial values from the last sim
ulation
 - describe()  - describe culture, broth, parameters, variables with val
ues/units

Note that both disp() and describe() takes values from the last simulati
on
and the command process_diagram() brings up the main configuration

Brief information about a command by help(), eg help(simu)
Key system information is listed with the command system_info()
```

In [ ]:
```
%matplotlib inline
plt.rcParams['figure.figsize'] = [25/2.54, 20/2.54]
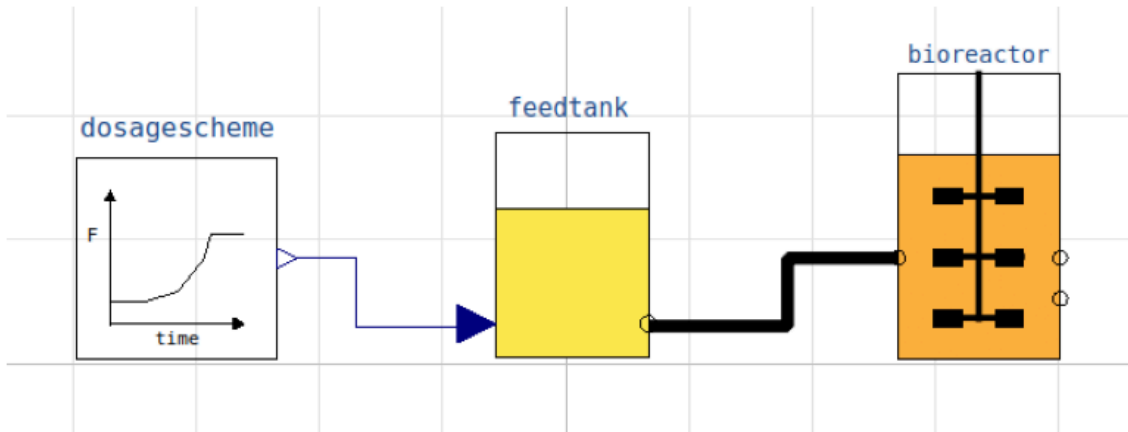```

In [ ]:
```
import warnings
```

```
import warnings
warnings.filterwarnings("ignore")
```

BPL_TEST2_Fedbatch - demo
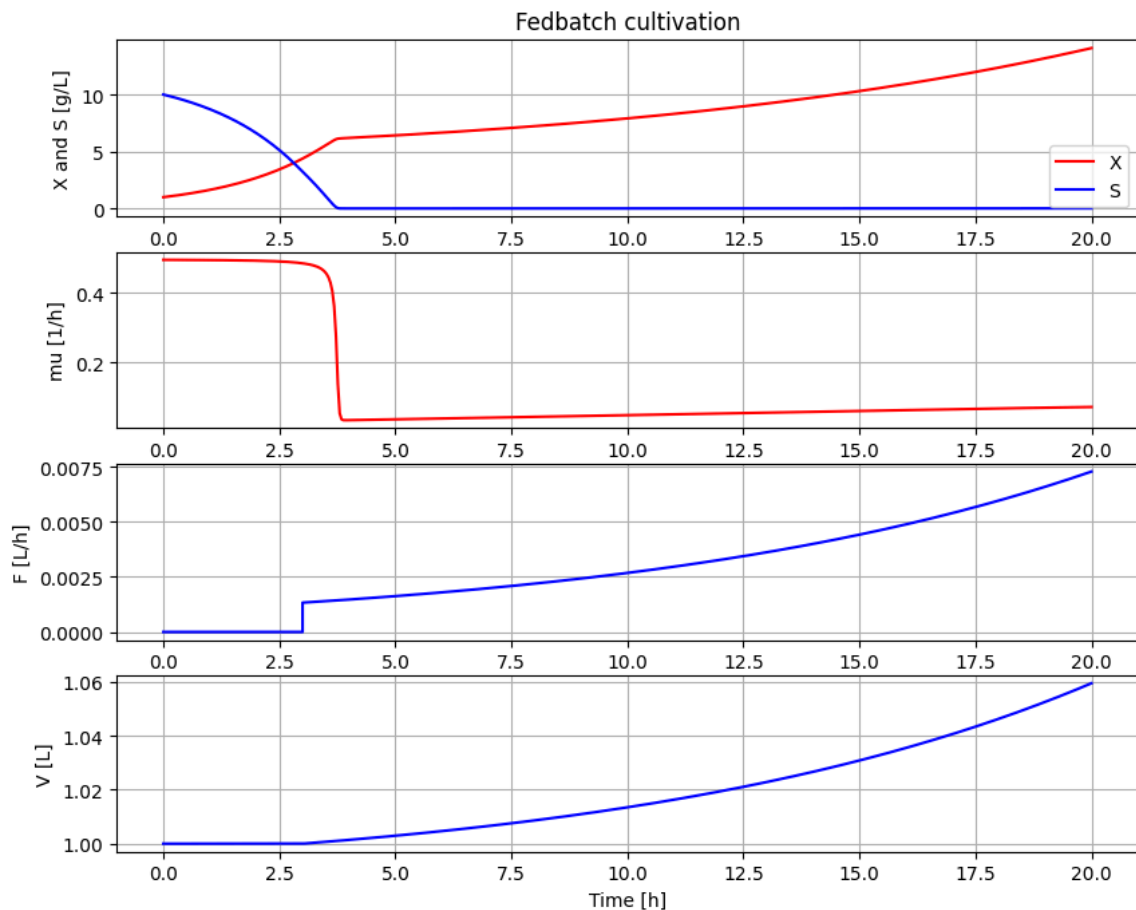
In [ ]:
```
process_diagram()
```

No processDiagram.png file in the FMU, but try the file on disk.

In [ ]:
```
describe('culture'); print(); #describe('liquidphase')
```

Simplified text book model — only substrate S and cell concentration X

In [ ]:
```
# Simulation with default values of the process
newplot(plotType='TimeSeries')
simu(20)
```

```
In [ ]:   disp(mode='long')
```