3. How to install

Mandyoc installation is very simple and it consists of installing both PETSc and *Mandyoc*.

> **Warning**
>
> The following installation steps work for both Linux and macOS machines **only** and no tests were made to install *Mandyoc* on Windows machines yet.

3.1. Dependencies

- PETSc
- gcc
- make
- git

Optional dependencies:

- gfortran
- pytest
- numpy
- os

3.2. PETSc Installation

Mandyoc requires the PETSc library to run. The first step is to **download** the latest release of PETSc from PETSc website or **clone** the repository into your machine:

```
git clone -b release https://gitlab.com/petsc/petsc.git $HOME/petsc
```

By default, we will download/clone in `~/petsc`.

Second, **configure the PETSc build** and set up the installation directory. By default, we will install PETSc in `~/petsc`.

```
cd $HOME/petsc
./configure \
  PETSC_DIR=$HOME/petsc \
  PETSC_ARCH=arch-label-optimized \
  --with-debugging=0 \
  --with-cc=gcc \
  --with-cxx=g++ \
  --download-fblaslapack \
  --download-mpich \
  --download-hdf5 \
  --download-superlu_dist \
  --download-metis \
  --download-parmetis \
  --download-mumps \
  --download-scalapack \
  --download-cmake \
  COPTFLAGS='-O3 -march=native -mtune=native' \
  CXXOPTFLAGS='-O3 -march=native -mtune=native'
```

Note

If using `gfortran` optional dependency add the options `--with-fc=gfortran` and `FOPTFLAGS='-O3 -march=native -mtune=native'` to the PETSc build configuration above.

Note

If you are build a development version of *Mandyoc* you can build a **debug version** of PETSc by setting `--with-debugging=1` and removing the `COPTFLAGS`, `CXXOPTFLAGS` (and `FOPTFLAGS`) flags. In this case, you may set `PETSC_ARCH=arch-label-debug`.

Check the installation with:

```
make all check
```

Or follow the instructions that pop up on the terminal.

For further information about the PETSc library, check the PETSc website.

3.3. *Mandyoc* Installation

To install the *Mandyoc* in your machine, you need to **clone or download the latest release** of the code from the Mandyoc repository page.

To clone the repository, navigate to the directory you wish to install *Mandyoc* and type:

```
git clone https://github.com/ggciag/mandyoc
```

Next, **build and install** *Mandyoc* by running:

```
make all
```

Note

To print *Mandyoc* runtime options, run mandyoc with *-flags* command line argument.

Check Mandyoc installation with:

```
make test_mandyoc
```

3.4. Examples

The benchmarks and other experiments are located in the examples folder of the Mandyoc repository.

Inside each example folder, you find a `README.md` file with detailed explanation and instrutions on how to run the experiment. First, you need to run the python script file named `generate_input_files.py` to generate the input files needed by Mandyoc. Then, you may execute *mandyoc* directly from a terminal command or update the bash script `run.sh` accordingly to your setup and execute it to run the experiment.