“Running MPI with gcc/g++ on MacOS M1 / ARM based systems” by Durwasa Chakraborty, IIT Madras

By default, MacOS M1 machines come with the clang compiler. Below are the steps to utilize gcc/g++ for MPI on a MacOS M1 machine. It's important to note that the clang `gcc` is located at `/usr/bin/*`. Modifying `/usr/bin/*` is not recommended as it may necessitate disabling SIP (System Integrity Protection). Instead, these steps create symlinks in `/usr/local/bin/*`

Installation Steps:

- Install gcc using Homebrew:
  ```sh
  brew install gcc
  ```
- Check the installation location of the g++ binaries. Start by finding Homebrew's location:
  ```sh
  which brew
  ```
- Then, list the installed g++ versions:
  ```sh
  ll /opt/homebrew/bin/g++-*
  ```
- Create symbolic links to the installed version (assuming the returned version is gcc-13):
  ```sh
  sudo ln -sf /opt/homebrew/bin/gcc-13 /usr/local/bin/gcc
  sudo ln -sf /opt/homebrew/bin/g++-13 /usr/local/bin/g++
  sudo ln -sf /opt/homebrew/bin/c++-13 /usr/local/bin/c++
  sudo ln -sf /opt/homebrew/bin/cpp-13 /usr/local/bin/cpp
  ```

This configuration maintains the original clang's g++ at `/usr/bin` (which can be verified with `/usr/bin/g++ --version`), making the gcc version accessible at `/usr/local/bin/g++`.

After installation, verify the gcc versions:

Ensure `/usr/local/bin/` is in your `PATH`, then execute:
```sh
g++ --version # Should return the GCC variant
```

Running MPI Commands:

For any command referenced in the class (mpicc, mpiexec, etc.), utilize the compiler wrapper flag `OMPI_CXX=gcc` for compiling with gcc. To compile with the clang compiler, use `OMPI_CXX=clang`.