ME 672 Finite Element Method

Running FEniCS in Docker

October 29, 2025

Overview

This handout explains how to load a prebuilt Docker image for the course and launch a JupyterLab session locally. You do not need to install Python or packages on your machine; everything runs in the container.

Prerequisites

- Install Docker Desktop (Windows/macOS) or Docker Engine (Linux).
- Ensure Docker is running: open a terminal and run `docker version`.

1. Download the image archive

In Lamaku, download the archive: `me-672_linux_amd64.tar.gz`

2. Load the image into Docker

Open a terminal in the folder where you downloaded the file and run:

macOS / Linux

```
docker load -i me-672_linux_amd64.tar.gz
```

Windows (PowerShell)

```
docker load -i .\me-672_linux_amd64.tar.gz
```

After loading, verify the image is present:

```
docker images | findstr me-672   # Windows
docker images | grep me-672      # macOS/Linux
```

You should see a repository name like `me-672` with a tag `amd64`.

3. Start JupyterLab

Run a container that publishes JupyterLab on your machine's port 8888 and mounts the current folder into the container at `/home/me-672/work`.

macOS / Linux

```
docker run --rm -it -p 8888:8888 -e JUPYTER_TOKEN=me672 \
  -v "$PWD":/home/me-672/work me-672:amd64
```

Windows (PowerShell)

```
docker run --rm -it -p 8888:8888 -e JUPYTER_TOKEN=me672 `
  -v "${PWD}:/home/me-672/work" me-672:amd64
```

Notes.

- If port 8888 is already in use, replace the left side with another port, e.g., `-p 8899:8888`, and open the corresponding URL.
- The environment variable `JUPYTER_TOKEN` sets a login token for convenience. You can change it to any short string.
- The `-v` flag mounts your current host directory so your notebooks are saved on your computer.

4. Open JupyterLab in your browser

After the container starts, open:

`http://localhost:8888/lab?token=me672`

Replace `8888` with your chosen host port if you changed it.

5. Stopping the container

Press `Ctrl+C` in the terminal where Docker is running, or close the terminal. The container was started with `-rm`, so it will be removed automatically.

Troubleshooting

- **"port already allocated"**: Try `-p 8899:8888` and use `http://localhost:8899`.
- **"permission denied" on the mounted folder**: On Windows/macOS, ensure Docker Desktop has access to that drive/folder (Settings → Resources → File Sharing).
- **Image not found**: Re-run `docker load -i ...` and then `docker images`.
- **Apple Silicon running AMD64 image**: It will run via emulation; performance is generally fine for this course.