AeroAspire - SDE Intern

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Week 5 – Day 2 (October 23)

Questions/Reflections :

1. Explain how a Docker image is built: layers, cache, context.

    - When you build a Docker image, it follows the **Dockerfile** line by line.
      Each line (like FROM, RUN, COPY, etc.) creates a **layer** — a snapshot of changes.
      These layers stack on top of each other to form the final image.
    - **Layers** → Each command adds a layer. If one layer changes, only that layer and the ones after it rebuild.
    - **Cache** → Docker remembers built layers. So if nothing changed in earlier steps, it uses the cached layer to save time.
    - **Context** → The context is basically the folder you run docker build from. Everything inside it is sent to Docker so it can copy files into the image (e.g., with COPY . /app).
    - So — layers = steps, cache = speed boost, context = the folder content Docker can see.

2. What is the difference between CMD and ENTRYPOINT?

Both are used to tell Docker what to run when the container starts — but they behave differently:

- **CMD**: It gives default arguments or commands. You can override it easily when running docker run.
  Example:
- CMD ["python", "app.py"]
  You can change it with:

  docker run myapp bash

- **ENTRYPOINT**: It's like the *main command* that always runs. Even if you pass extra arguments, they get added to it.
  Example:
- ENTRYPOINT ["python"]
- CMD ["app.py"]

  When you run docker run myapp test.py, it actually runs python test.py.

  So — **ENTRYPOINT** is the fixed base command, **CMD** is flexible and can be overridden.

3. How is a Flask server inside a container accessed via browser? What ports need to be exposed?

   - Normally, Flask runs inside the container (like app.run(host="0.0.0.0", port=5000)), but your browser is outside it.
   - To access it, you need to expose and map the port:
   - Inside container → Flask listens on port 5000
   - Outside → You map that port to your system, e.g. docker run -p 5000:5000 flask-app
   - The first 5000 is your computer's port, the second is the container's.
   - Then you can open your browser and go to:
   - http://localhost:5000