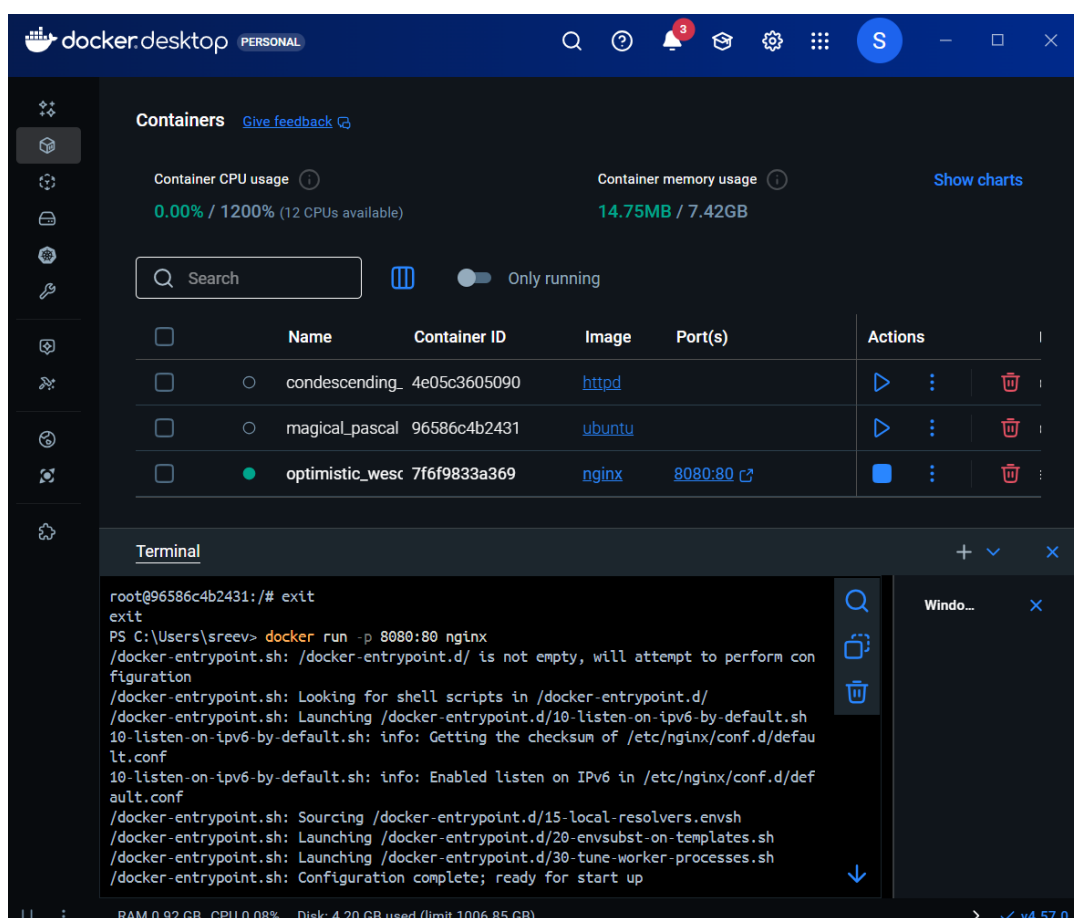


Learnings for lifetime:

1)Port publishing activity

So basically, covered publishing port mechanism, I must say it's just intricately beautiful though it might be very basic it really showed me how powerful docker is even at basic levels, so according to what I understood of it, since containers run in isolated namespaces the ports they use are inaccessible to users outside of it so we publish the port sort of exposing it to outside world by **publishing a port** which is Docker's way of intentionally breaking that isolation in a controlled manner: Docker makes the **host machine listen on a chosen port** and then **forwards all traffic arriving on that host port to the container's internal port**.

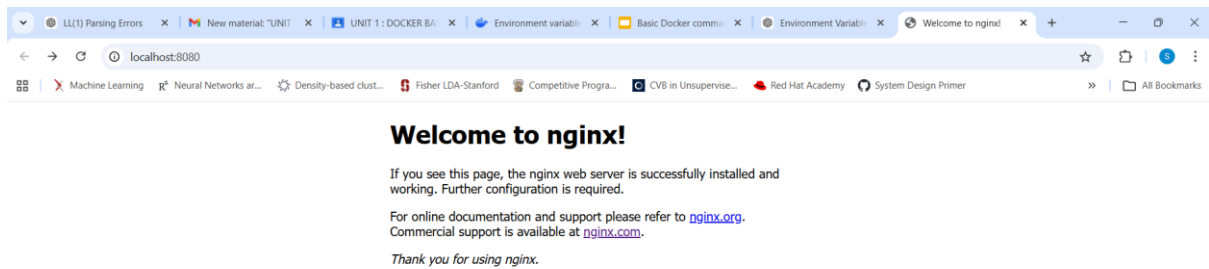
In other words, the container still thinks it is listening privately, but Docker transparently acts as a bridge between the external world and the container, exposing only what we explicitly allow.



The screenshot displays the Docker Desktop application window. The top bar shows the Docker logo, a search icon, a help icon, a notification bell with a red '3', a settings gear, a grid icon, and a user profile 'S'. The main interface is divided into a sidebar on the left with icons for containers, images, volumes, networks, and settings. The central area is titled 'Containers' and includes a 'Give feedback' link. It shows system metrics: 'Container CPU usage' at 0.00% / 1200% (12 CPUs available) and 'Container memory usage' at 14.75MB / 7.42GB, with a 'Show charts' link. Below these is a search bar and a filter toggle for 'Only running'. A table lists three containers:

	Name	Container ID	Image	Port(s)	Actions
<input type="checkbox"/>	condescending_	4e05c3605090	httpd		
<input type="checkbox"/>	magical_pascal	96586c4b2431	ubuntu		
<input checked="" type="checkbox"/>	optimistic_wesc	7f6f9833a369	nginx	8080:80	

Below the table is a 'Terminal' section with a search bar and window controls. It shows a command prompt where the user has run `docker run -p 8080:80 nginx`. The terminal output shows the container's entrypoint scripts being executed, including `/etc/nginx/conf.d/default.conf`, and ends with 'Configuration complete; ready for start up'. At the bottom of the window, system statistics are shown: 'RAM 0.92 GB', 'CPU 0.08%', and 'Disk: 4.20 GB used (limit 1006.85 GB)'. The version 'v4.57.0' is displayed in the bottom right corner.

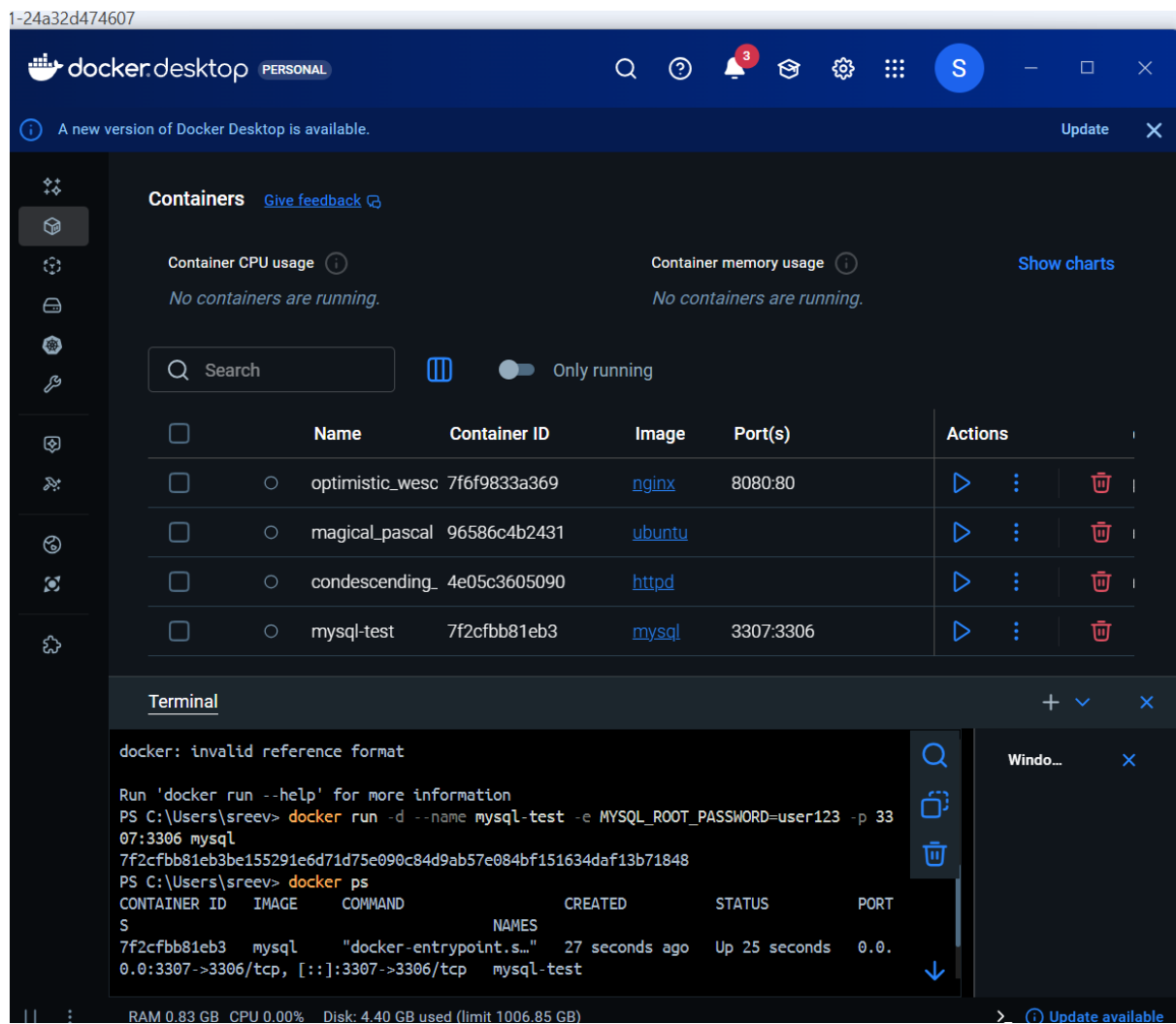


What happens internally?

Browser → localhost:8080 → Docker Host → Container:80 → Nginx

2)Some more interesting stuff ahead: started to work more on port publishing and MySQL container initialization.

Started exploring Docker port publishing and MySQL container initialization in more depth. By running a MySQL container in detached mode and setting the `MYSQL_ROOT_PASSWORD` environment variable, I understood how Docker images use environment variables during initialization to configure services automatically. I also learned that publishing a port (`-p 3307:3306`) does not affect how services work *inside* the container, but instead allows the host machine to access the MySQL server running in the container. Using `docker exec`, I was able to run the MySQL client inside the container without relying on port publishing, which clarified the difference between internal container access and external host access. Overall, this showed how Docker maintains isolation by default while still allowing controlled exposure of services when needed.



```
PS C:\Users\sreev> docker exec -it mysql-test mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 9.6.0 MySQL Community Server - GPL

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
PS C:\Users\sreev> |
```

When I publish a port in Docker, I’m not “opening a port inside the container.” I’m asking Docker to stand at the host’s door, listen on my behalf, and quietly forward anything it hears into the container’s private world. Behind the scenes, Docker sets up all the low-level networking machinery—NAT rules, packet forwarding, and bridge connections—so the container

remains isolated, yet reachable, without me ever touching iptables or firewall configurations.