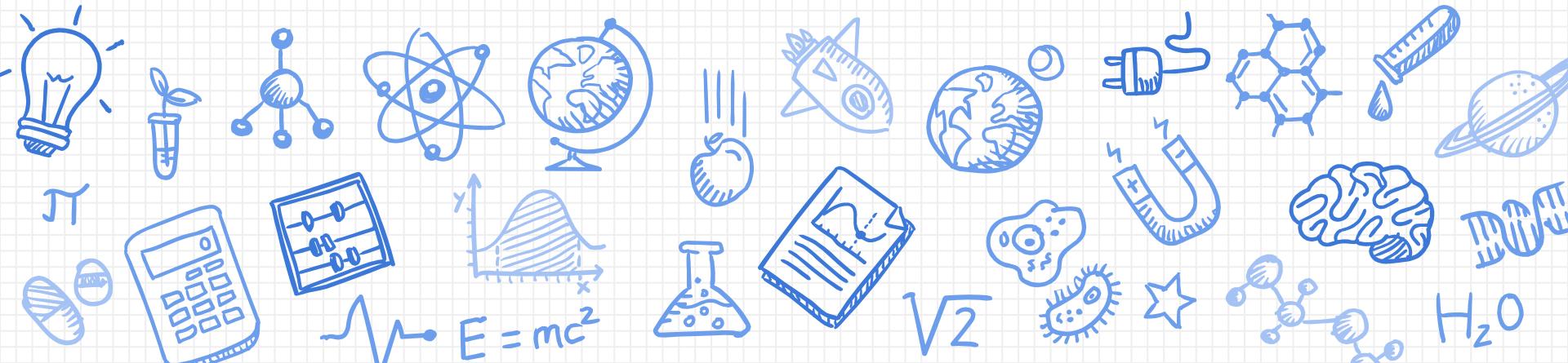


Introduction to Docker





HELLO!

I am Nilesh Jayanandana

Senior Software Engineer at Platformer



twitter.com/nilesh_93



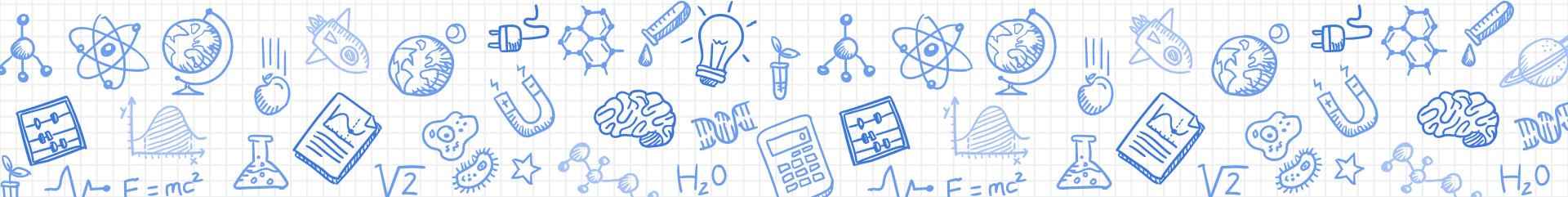
[medium.com/nilesh93.j](https://medium.com/@nilesh93.j)



linkedin.com/in/nilesh93

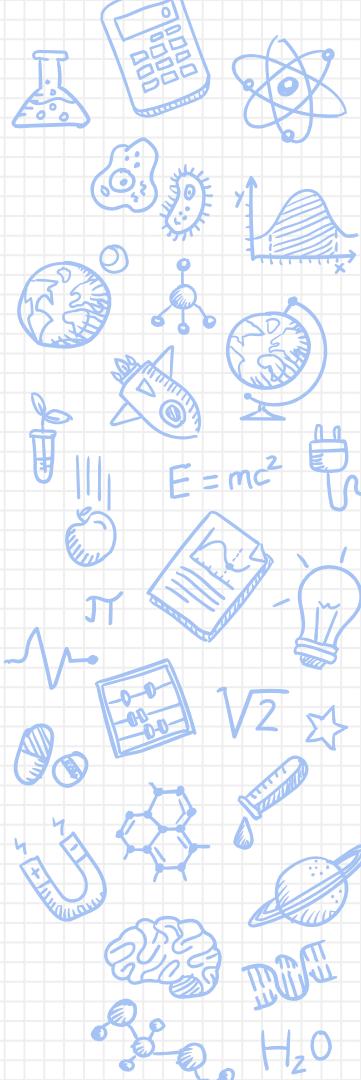
Pre requisites

Couple of concepts you need to be familiar with



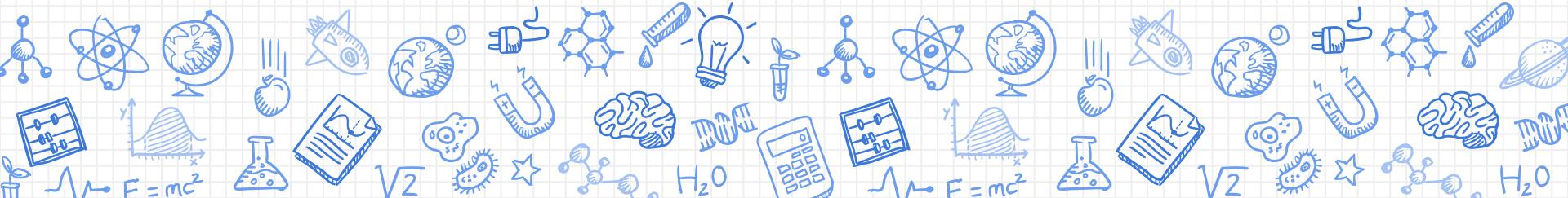
Prerequisite concepts needed to know

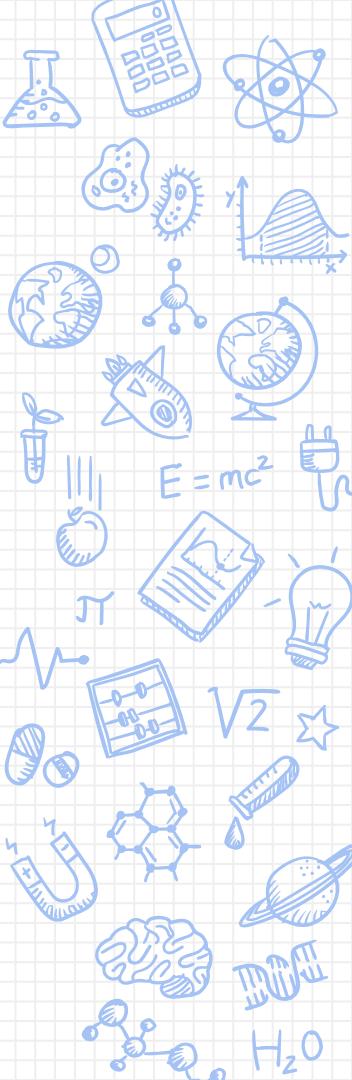
- ✗ How to deploy an application to a server
- ✗ Scaling applications



A history Lesson

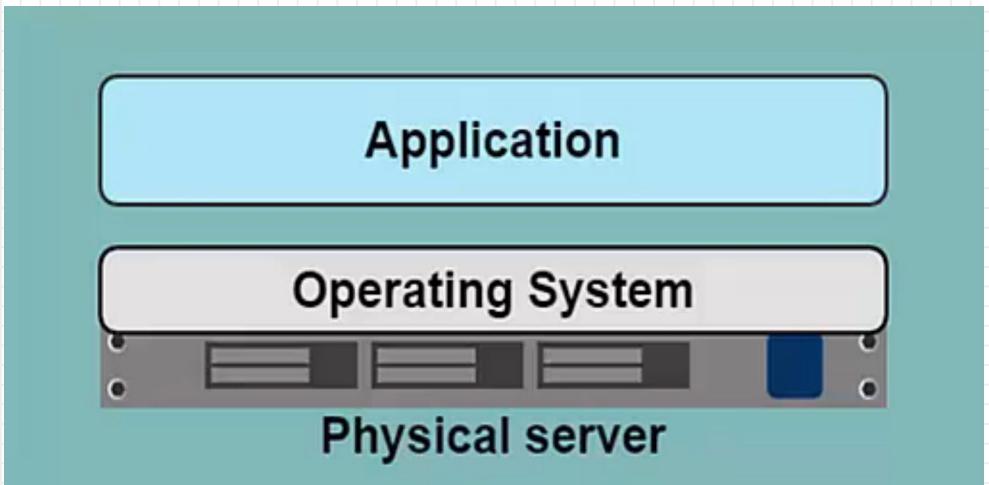
Journey through the evolution of Ops





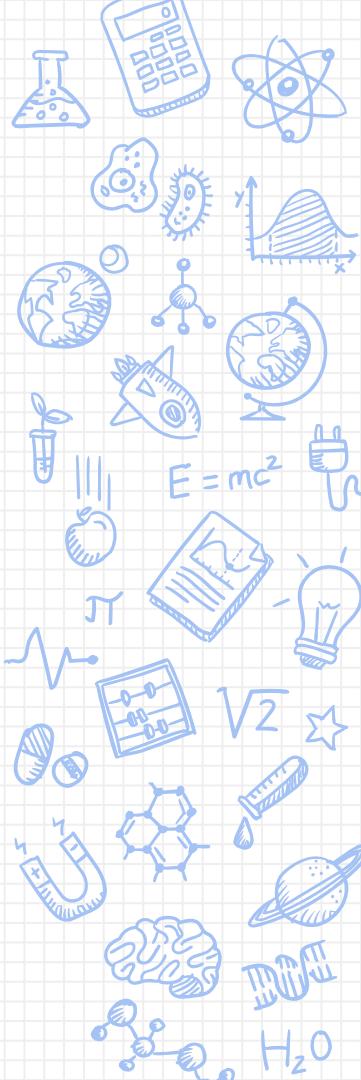
A History Lesson: Dark Ages

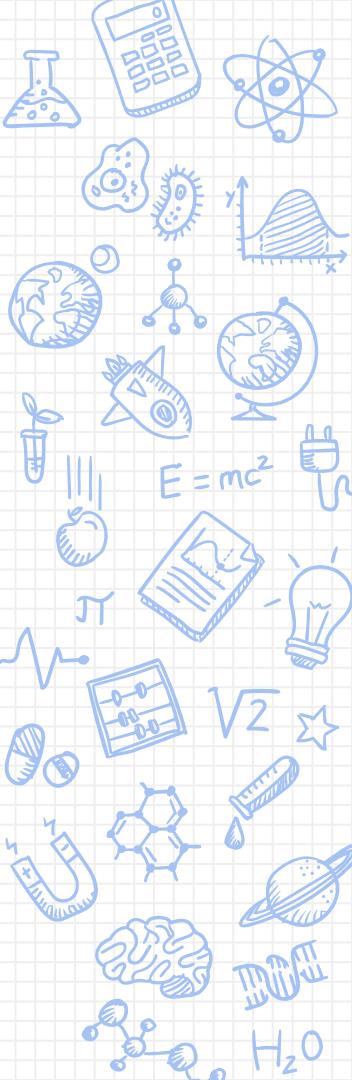
One Physical Server → One Application



Limitations

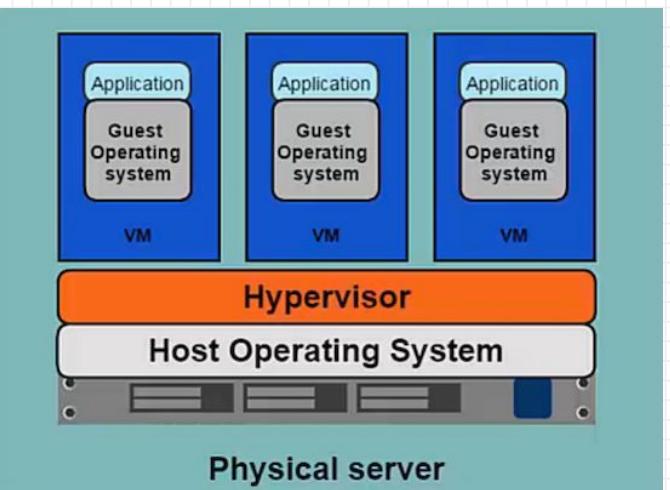
- ✗ Slow deployment times
- ✗ Huge costs
- ✗ Difficult to scale
- ✗ Wasted resources
- ✗ Difficult to migrate





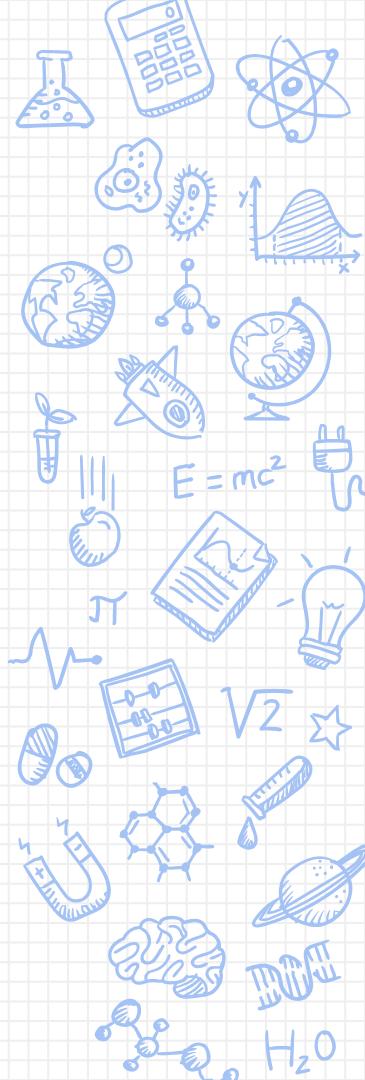
A History Lesson: Hypervisor based Virtualization

- ✗ One physical Server → multiple VMs
- ✗ One VM → One Application



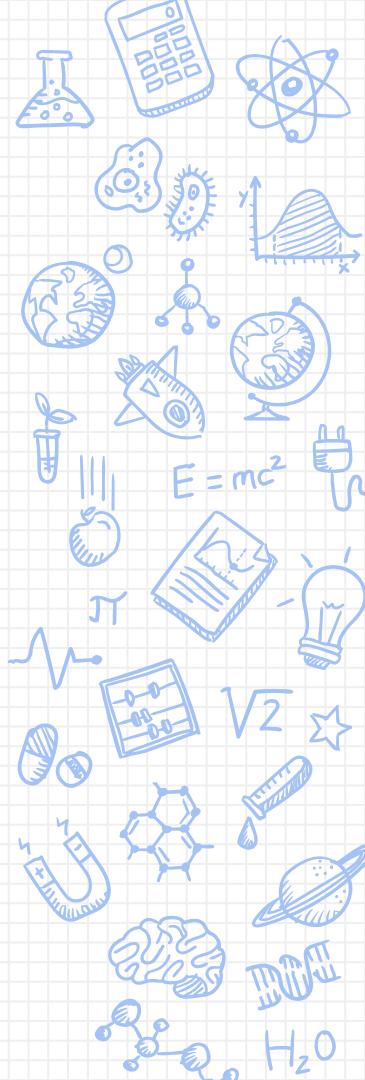
Benefits of VMs

- ✗ Better resource pooling
- ✗ Easier to scale
- ✗ Cloud service providers (AWS, Google, Azure)

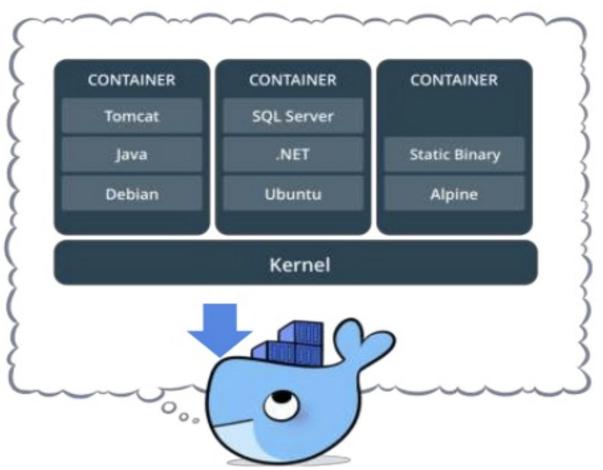


Limitations of VMs

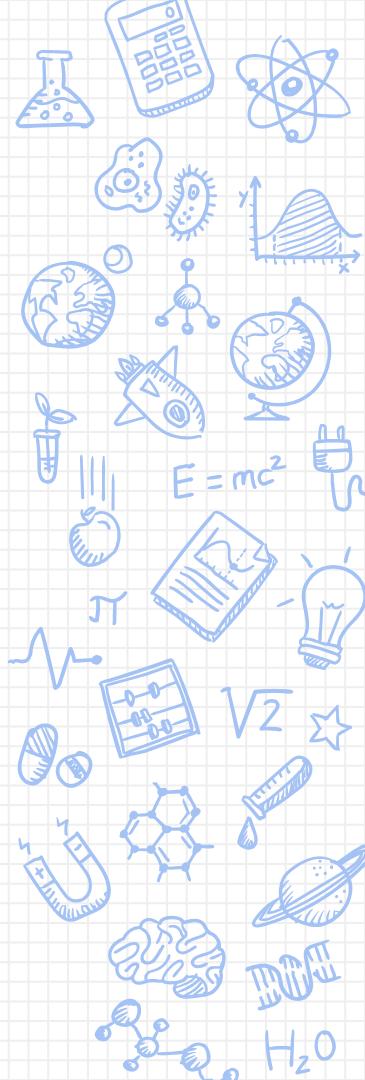
- ✗ Wasted resources for Guest OS
- ✗ Portability not guaranteed
- ✗ More VMs you run, more resources needed.



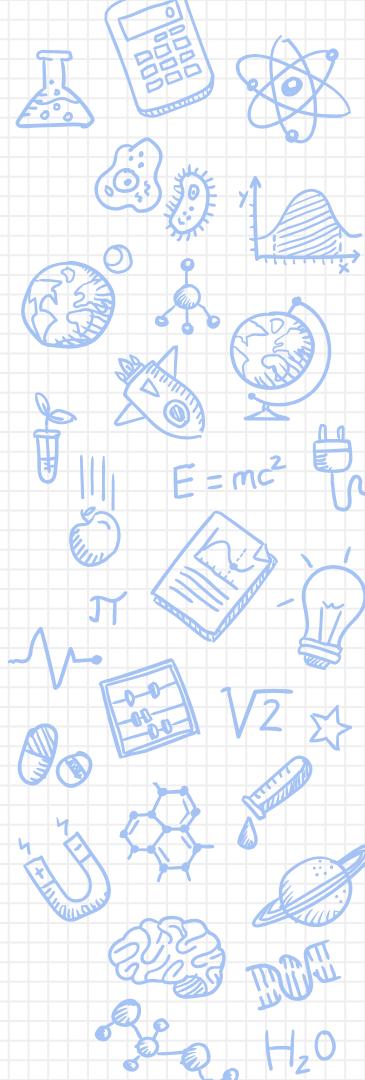
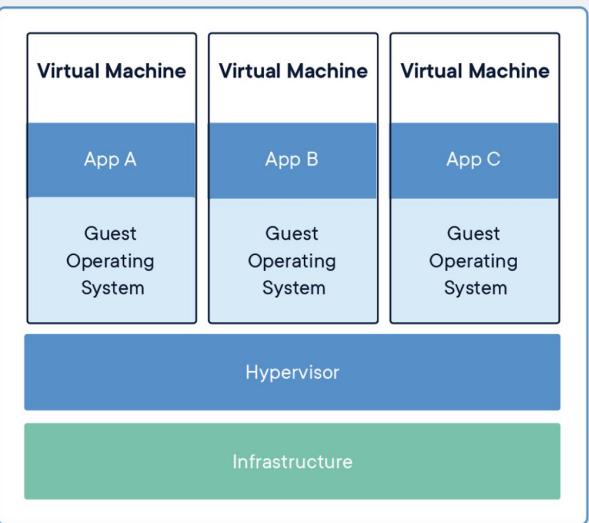
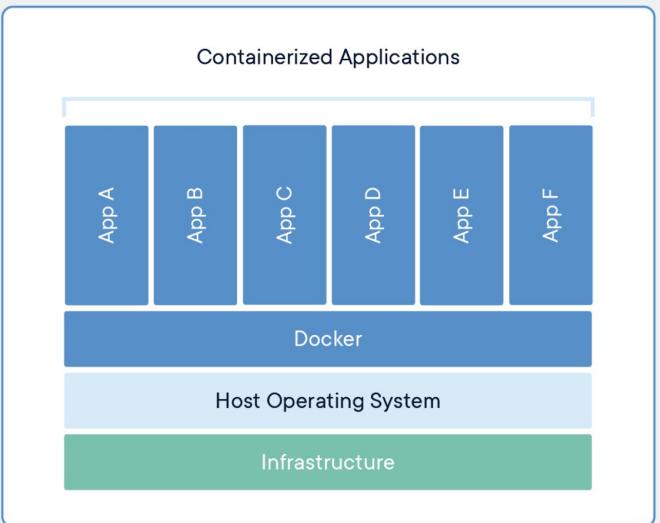
A history lesson: Present Day



Containers are a solution to the problem of how to get software to run reliably when moved from one computing environment to another.

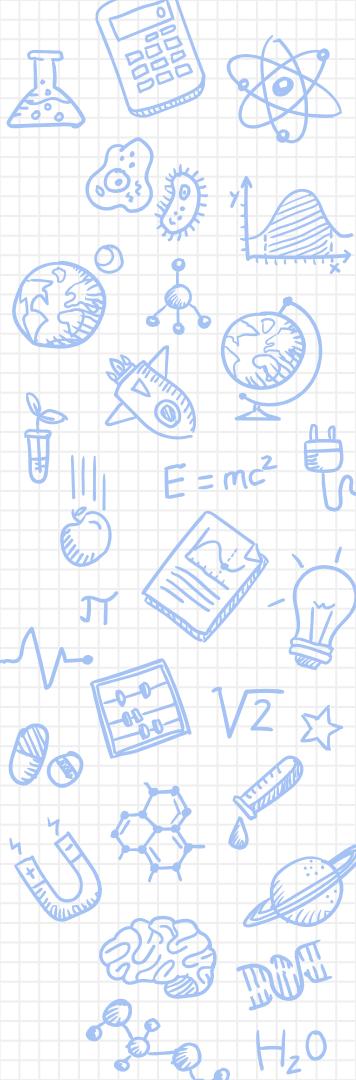


Containers vs VMs

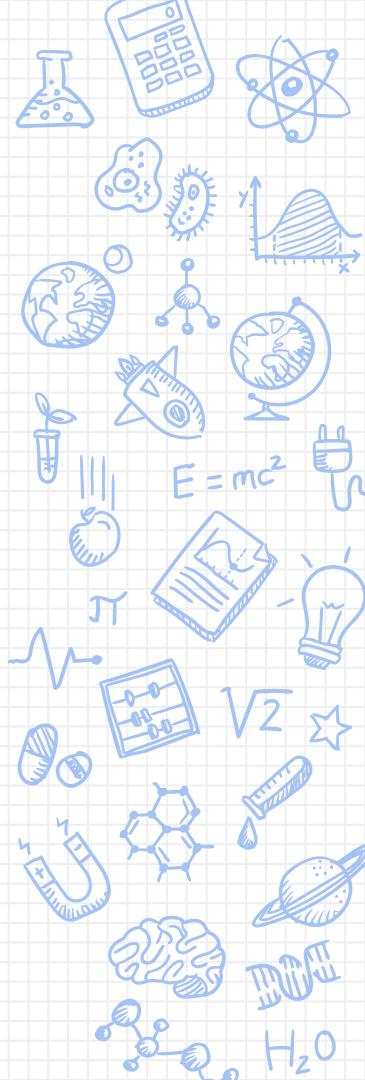
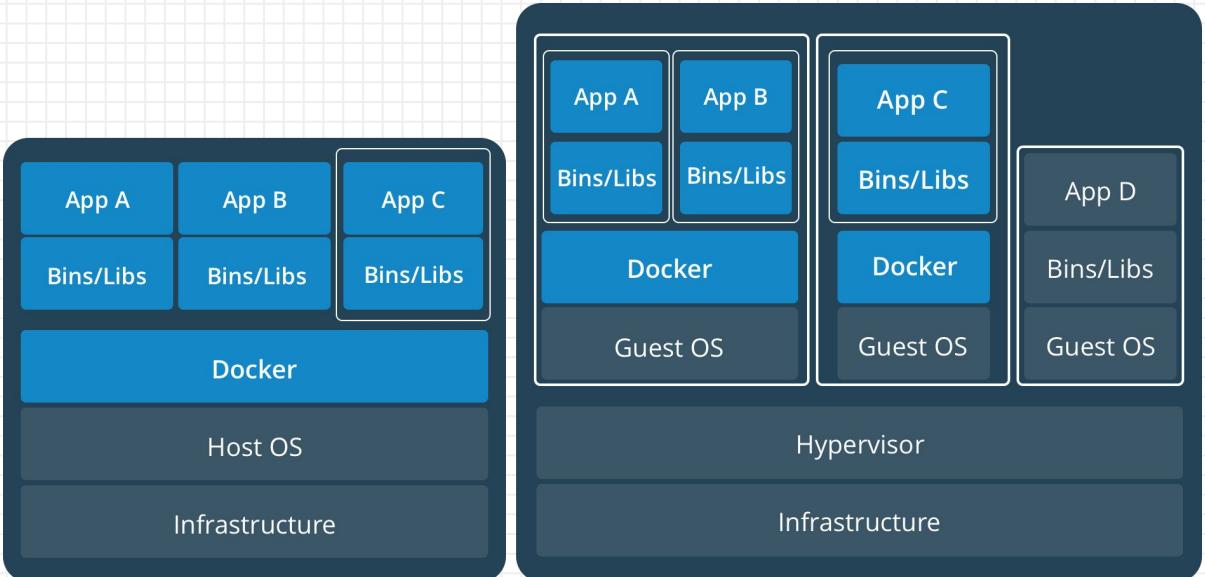


Containers vs VMs

- ✗ Similar resource isolation and allocation benefit.
- ✗ Containers virtualize the operating system instead of hardware.
- ✗ Containers are more portable and efficient.



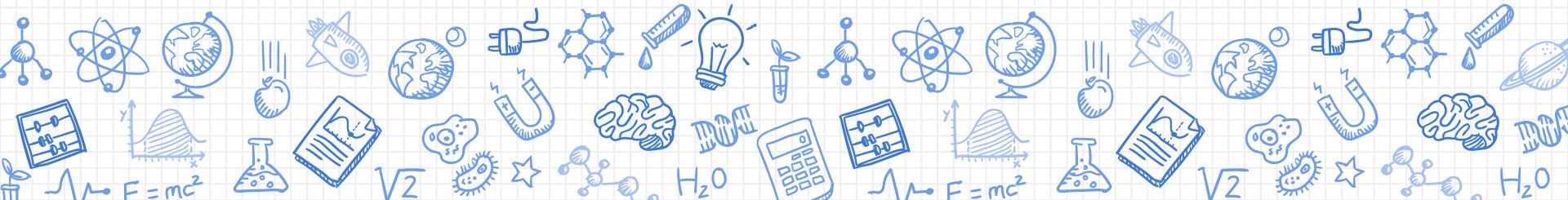
Mixing VMs and Containers together



What is Docker?

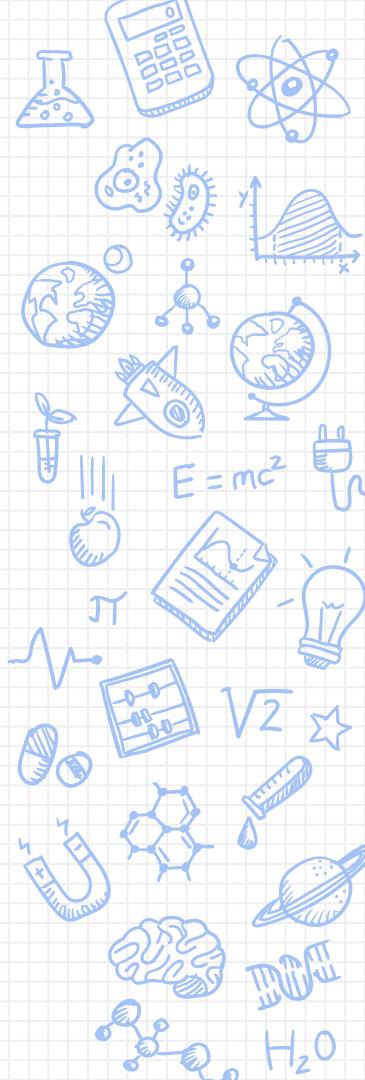
The tool used to containerize applications

<https://www.docker.com/products/docker-desktop>



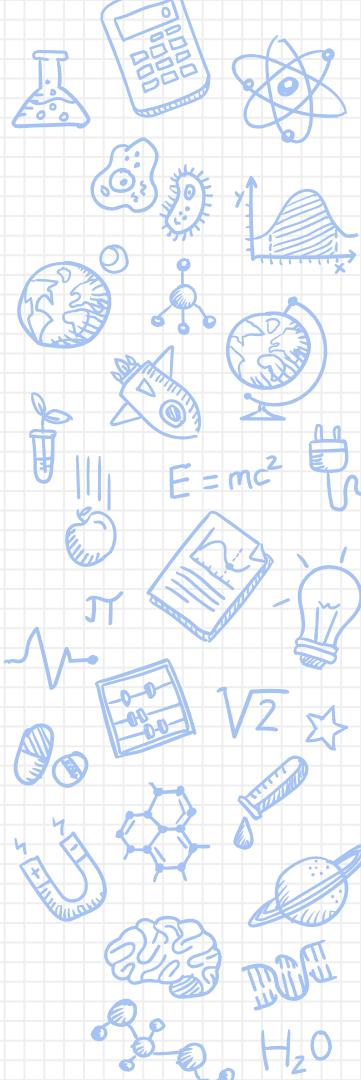
Common problems SLIIT Undergrads Have

- ✗ Unable to setup your application in a friend's machine
- ✗ Cannot run multiple applications configured on same port

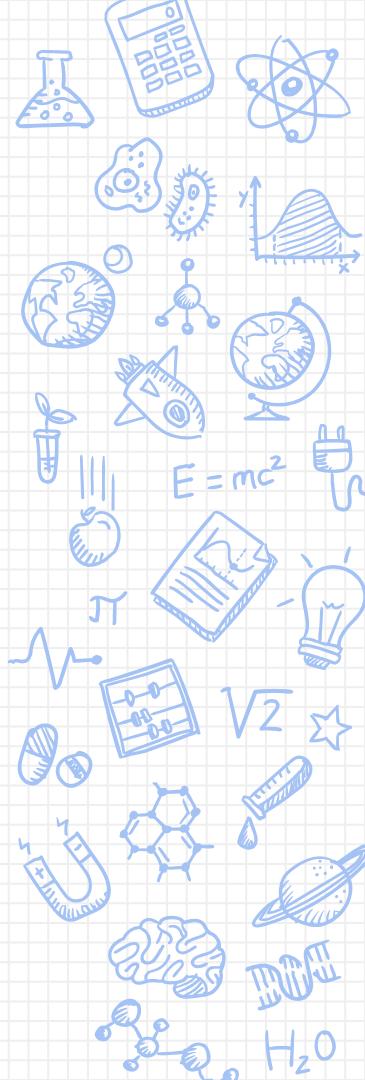


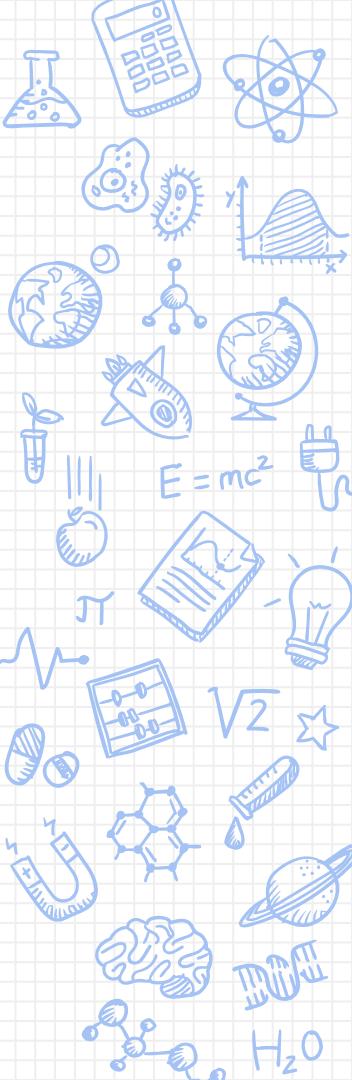
Solution – Containerizing Applications

- ✗ Portability
- ✗ Isolation of processes
- ✗ Lightweight
- ✗ Modularity
- ✗ Simplicity
- ✗ Security



Simply put





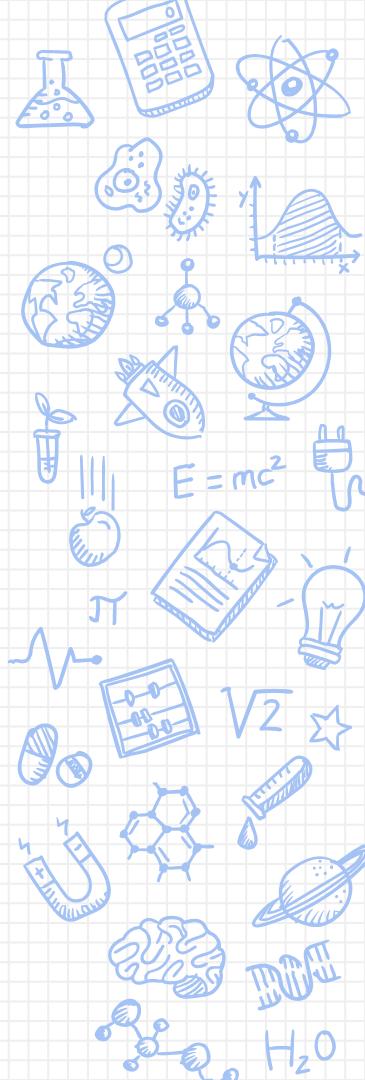
Developer Use Cases

- ✗ Use docker for local app development
- ✗ Deploy your application in any Server without an issue
- ✗ Easily scale
- ✗ Ensure Availability

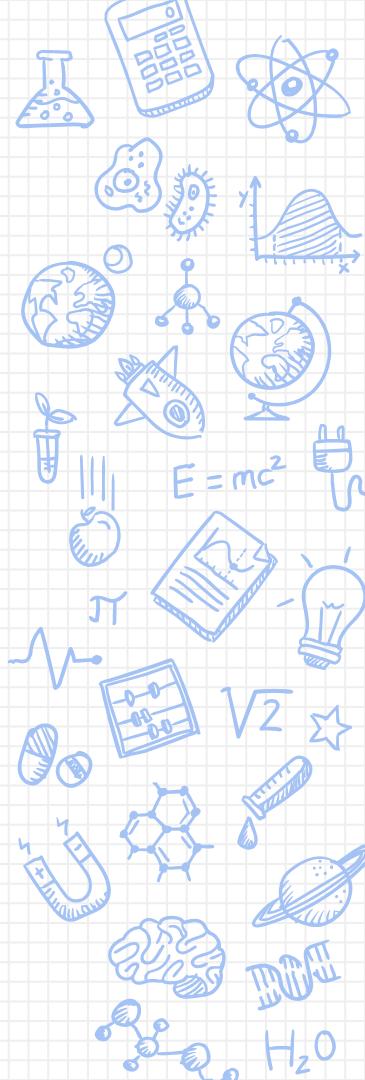
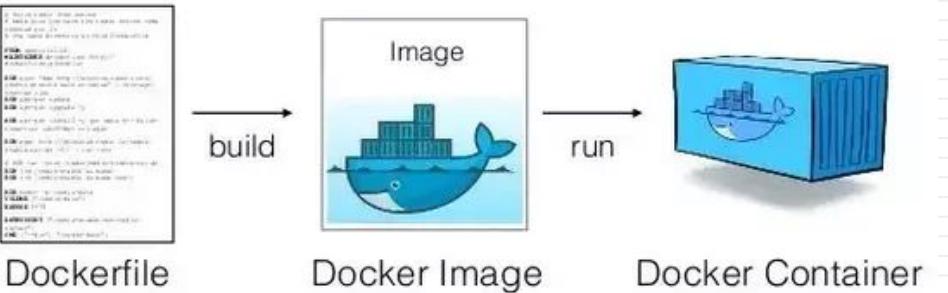
Many more...

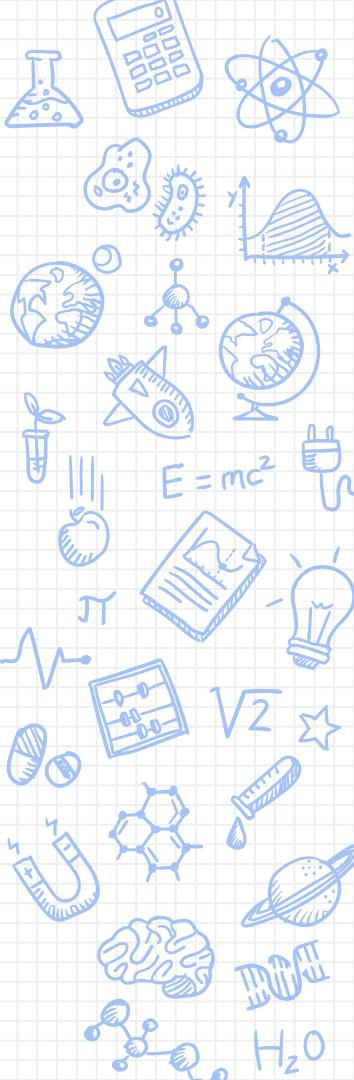
Docker Basics

- ✗ Dockerfile
- ✗ Images
- ✗ Containers
- ✗ Registry
- ✗ Engine



Docker Images and Containers





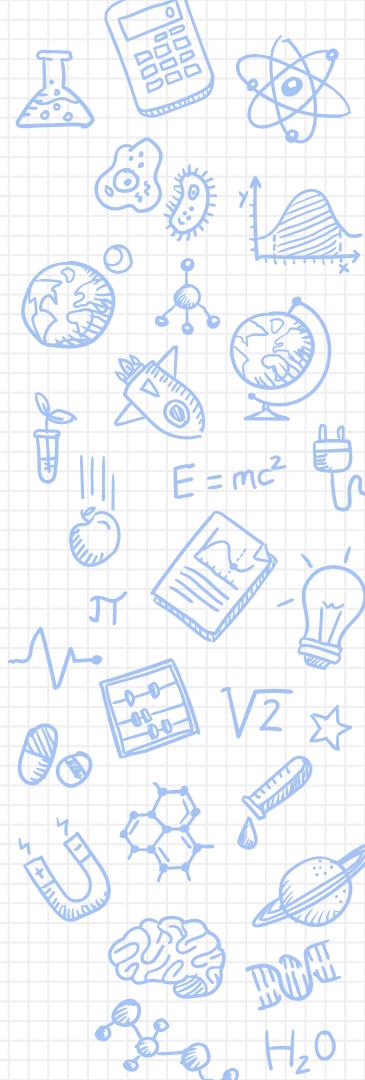
Things to consider

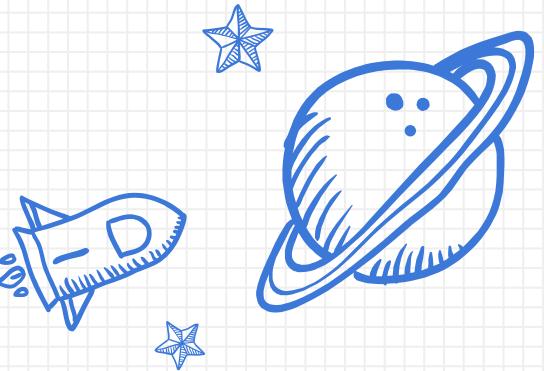
- ✗ Size of the container (Depends on base image) - smaller the better
- ✗ Ports exposed
- ✗ Make application stateless as possible
- ✗ Remove sensitive information from code and get from env

Dockerfile

The config file used to build docker images

- ✗ FROM
- ✗ RUN
- ✗ WORKDIR
- ✗ COPY
- ✗ EXPOSE
- ✗ CMD



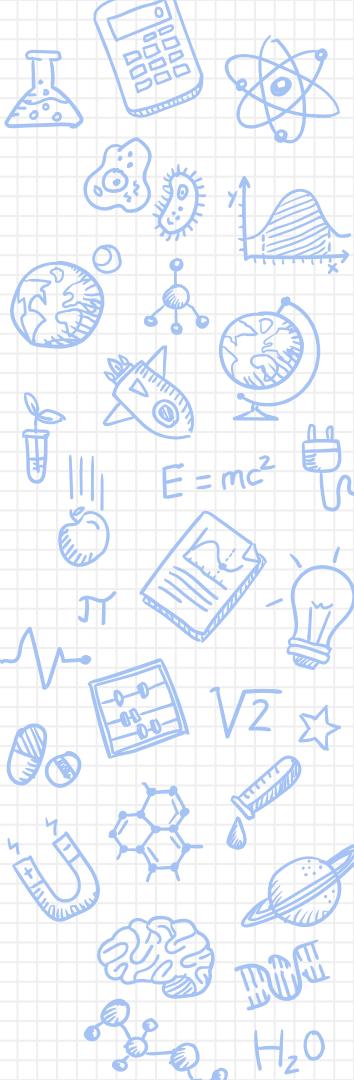


Demo



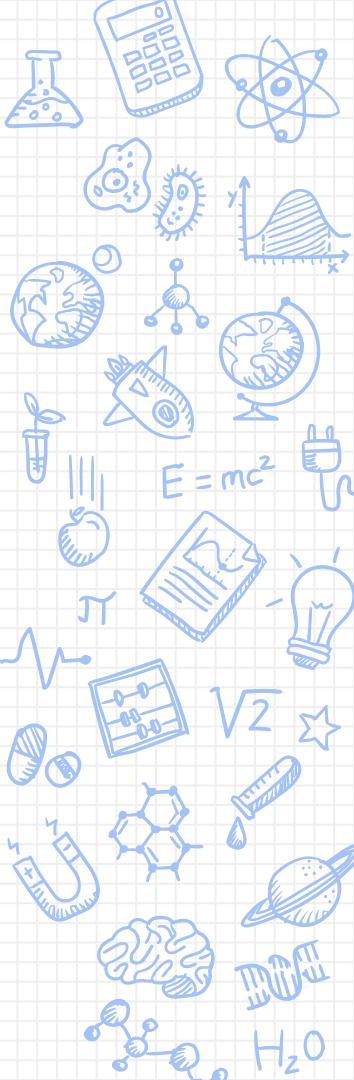
Couple of important commands to remember

- ✗ Docker image ls - list images
- ✗ Docker container ls - list containers
- ✗ Docker build -t <any name> . - build from Dockerfile
- ✗ Docker run <tag name> - run a container from image



Flags to be passed to Docker run

- ✗ `-p <host>:<container>` - port binding
- ✗ `-v <absolute-host-path>:<container-path>` - Volume binding
- ✗ `-it <tag name> /bin/sh` - access shell of container



Complete Example

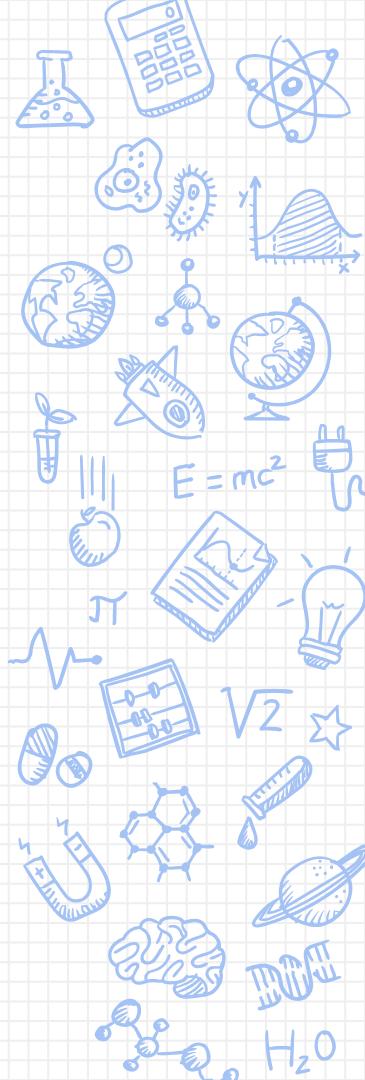
1. docker build -t my-app .
2. docker run \-p 8080:3000 \
 -\v \$(pwd):/app \
 -\e SAMPLE_ENV=sliit \
 -it my-app /bin/sh

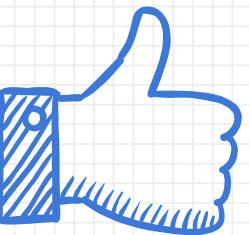
***Remove the letters in blue color if you don't want to access the shell of the container

What's Next?

- ✗ Container Orchestration (eg: Kubernetes)
- ✗ CI/CD
- ✗ Scaling
- ✗ Multi Stage Builds

And many more...





THANKS!

Any questions?

You can find me at



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[medium.com/nilesh93.j](https://medium.com/@nilesh93.j)



[linkedin.com/in/nilesh93](https://www.linkedin.com/in/nilesh93)