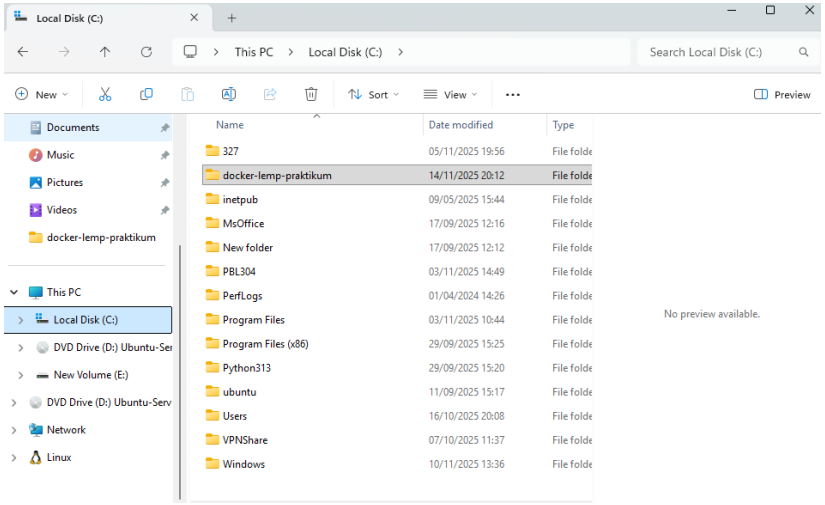
Praktikum: Instalasi LEMP Stack dengan Docker Compose (Windows)

Persiapan Awal (Pre-Requisites)

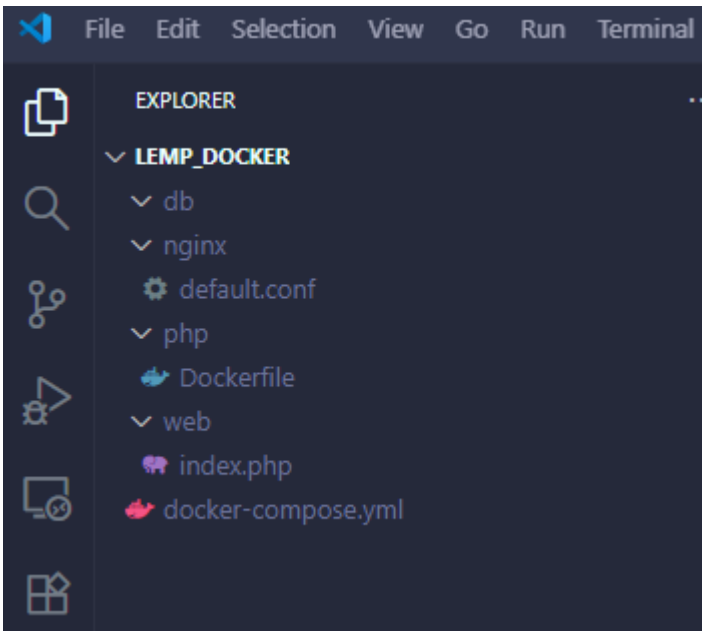
1. Docker Desktop Terinstal: Pastikan Docker Desktop sudah terinstal, WSL 2 aktif, dan Docker Engine berjalan (ikon Docker berwarna hijau di system tray).
2. Direktori Proyek: Buat sebuah folder proyek utama di drive lokal Anda, misalnya: C:\docker-lemp-praktikum.



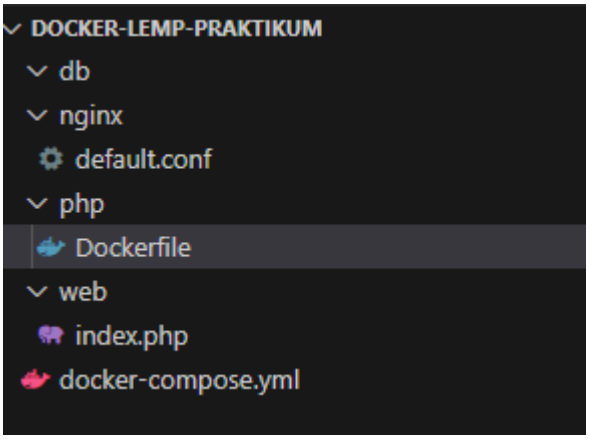
3. File Konfigurasi: Di dalam folder proyek tersebut, buat tiga sub-folder dan tiga file kunci:

Folder / File	Kegunaan
web (Folder)	Menyimpan kode PHP/HTML/aplikasi Anda.
db (Folder)	Menyimpan data database secara persisten.
nginx (Folder)	Menyimpan file konfigurasi Nginx kustom.
Php (Folder)	Menyimpan konfigurasi yang dibutuhkan
docker-compose.yml	File utama untuk mendefinisikan semua layanan.
nginx/default.conf	File konfigurasi Nginx untuk *virtual host*.
web/index.php	File uji coba PHP.

Contoh:



Hasil :

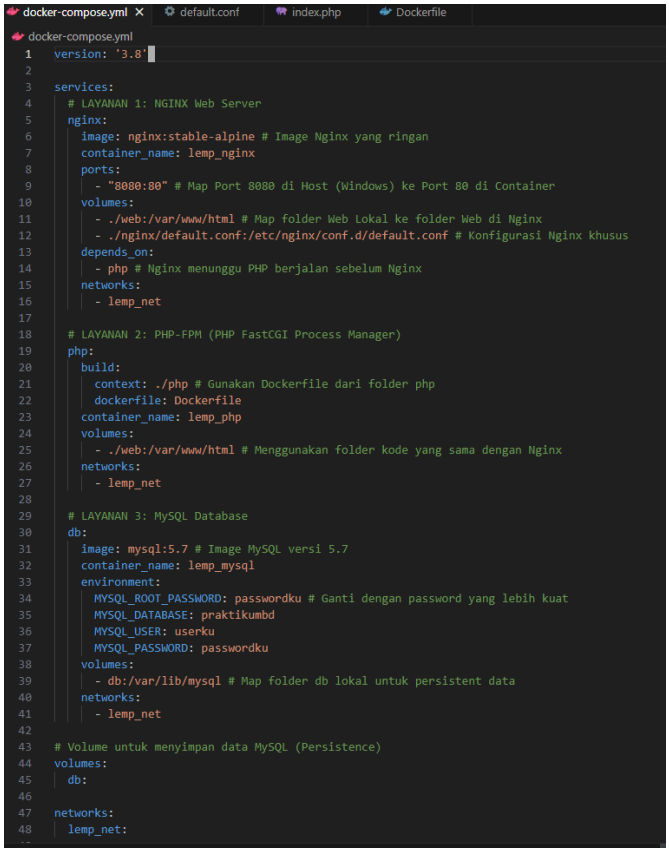


A. Mendefinisikan Layanan dengan docker-compose.yml
Tujuan: Mendefinisikan tiga layanan utama (Nginx, PHP, MySQL) dan network dalam satu file konfigurasi.
Buat File docker-compose.yml: Gunakan editor teks (misalnya VS Code atau Notepad++) untuk membuat dan mengisi file ini di direktori proyek utama Anda.

docker-compose.yml

```yaml
version: '3.8'
services:
  # LAYANAN 1: NGINX Web Server
  nginx:
    image: nginx:stable-alpine # Image Nginx yang ringan
    container_name: lemp_nginx
    ports:
      - "8080:80" # Map port 8080 di Host (Windows) ke port 80 di Container
    volumes:
      - ./web:/var/www/html # Map folder web lokal ke folder root Nginx
      - ./nginx/default.conf:/etc/nginx/conf.d/default.conf # Konfigurasi Nginx kustom
    depends_on:
      - php # Pastikan PHP berjalan sebelum Nginx

  # LAYANAN 2: PHP-FPM (PHP FastCGI Process Manager)
  php:
    build:
      context: ./php # Gunakan Dockerfile dari folder php
      dockerfile: Dockerfile
    container_name: lemp_php
    volumes:
      - ./web:/var/www/html # Menggunakan folder kode yang sama dengan Nginx

  # LAYANAN 3: MySQL Database
  db:
    image: mysql:5.7 # Image MySQL versi 5.7
    container_name: lemp_mysql
    environment:
      MYSQL_ROOT_PASSWORD: passwordku # Ganti dengan password yang lebih kuat
      MYSQL_DATABASE: praktikumdb
      MYSQL_USER: userku
      MYSQL_PASSWORD: passwordku
    volumes:
      - db:/var/lib/mysql # Map folder db lokal untuk persistensi data

# Volume untuk menyimpan data MySQL (Persistence)
volumes:
  db:
```

Hasil :



B. Konfigurasi Nginx dan File Uji Coba

Tujuan: Menyiapkan konfigurasi Nginx agar berkomunikasi dengan container PHP.
Buat File nginx/default.conf: Buat file ini di dalam folder nginx dan pastikan Nginx meneruskan permintaan .php ke container php (sesuai nama service di docker-compose.yml).

nginx > default.conf

```
server {
    listen 80;
    index index.php index.html;
    root /var/www/html;

    location / {
        try_files $uri $uri/ =404;
    }

    location ~ \.php$ {
        fastcgi_split_path_info ^(.+\.php)(/.+)$;
        fastcgi_pass php:9000; # Meneruskan ke Service PHP (Port 9000 default PHP-FPM)
        fastcgi_index index.php;
        include fastcgi_params;
        fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
        fastcgi_param PATH_INFO $fastcgi_path_info;
    }
}
```

Hasil :

nginx > default.conf

```
server {
    listen 80;
    index index.php index.html;
    root /var/www/html;

    location / {
        try_files $uri $uri/ =404;
    }

    location ~ \.php$ {
        fastcgi_split_path_info ^(.+\.php)(/.+)$;
        fastcgi_pass php:9000; # Meneruskan ke Service PHP (Port 9000 default PHP-FPM)
        fastcgi_index index.php;
        include fastcgi_params;
        fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
        fastcgi_param PATH_INFO $fastcgi_path_info;
    }
}
```

Buat File Uji Coba web/index.php: Buat file ini di dalam folder web untuk menguji konektivitas Nginx dan PHP.

web > index.php > ...

```
<?php
echo "<h1>LEMP Stack Berhasil Dijalankan!</h1>";
echo "<p>PHP Version: " . phpversion() . "</p>";

$host = 'db';
$user = 'userku';
$pass = 'passwordku'; // Pastikan sesuai dengan variabel ENV di docker-compose.yml
$db = 'praktikumdb';

$conn = mysqli_connect($host, $user, $pass, $db);

if ($conn) {
    echo "<p style='color: green;'>Koneksi Database Berhasil!</p>";
} else {
    echo "<p style='color: red;'>Koneksi Database Gagal: " . mysqli_connect_error() . "</p>";
}
```

Hasil :

web > index.php

```php
<?php
echo "<h1>LEMP Stack Berhasil Dijalankan!</h1>";
echo "<p>PHP Version: " . phpversion() . "</p>";

$host = 'db';
$user = 'userku';
$pass = 'passwordku'; // Pastikan sesuai dengan variabel ENV di docker-compose.yml
$db = 'praktikumbd';

$conn = mysqli_connect($host, $user, $pass, $db);

if ($conn) {
    echo "<p style='color: green;'>Koneksi Database Berhasil</p>";
} else {
    echo "<p style='color: red;'>Koneksi Database Gagal: " . mysqli_connect_error() . "</p>";
}
?>
```

Agar mysqli bisa digunakan oleh PHP maka, dockerfile perlu di buat:

php > Dockerfile

```
# php/Dockerfile

# 1. Image Dasar
FROM php:7.4-fpm-alpine

# Install MySQLi extension
RUN docker-php-ext-install mysqli
```

Hasil :

php > Dockerfile

```
# php/Dockerfile

# 1. Image Dasar
FROM php:7.4-fpm-alpine

# Install MySQLi extension
RUN docker-php-ext-install mysqli
```

C. Menjalankan dan Menguji Stack

Tujuan: Menjalankan semua container dan memverifikasi koneksi.

1. Buka Terminal Windows: Buka PowerShell atau Command Prompt dan arahkan ke direktori proyek utama Anda (cd C:\docker-lemp-praktikum).

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\docker-lemp-praktikum>
```

2. Jalankan Docker Compose: Jalankan perintah untuk membangun (build) image jika diperlukan dan menjalankan semua layanan.
    a. Perintah: docker-compose up -d
    b. Opsi -d (detached) akan menjalankan container di latar belakang.

```
PS C:\docker-lemp-praktikum> docker-compose up -d
time="2025-11-14T20:22:31+07:00" level=warning msg="C:\\docker-lemp-praktikum\\docker-compose.yml: the attribute `version`
[+] Running 21/21
 ✔nginx Pulled                                                                                                    9.9s
   ✔3e300a7cb18c Pull complete                                                                                    5.0s
   ✔f637881d1138 Pull complete                                                                                    4.3s
   ✔c4fca37af7b3 Pull complete                                                                                    2.1s
   ✔e6918dcfd20d Pull complete                                                                                    1.8s
   ✔b8554c5f1ad0 Pull complete                                                                                    4.6s
   ✔bc1d7488b05e Pull complete                                                                                    4.8s
   ✔71a39d0d04b2 Pull complete                                                                                    4.7s
   ✔8e049f0fd151 Pull complete                                                                                    1.9s
 ✔db Pulled                                                                                                      20.7s
   ✔df9a4d85569b Pull complete                                                                                    1.4s
   ✔6b95a940e7b6 Pull complete                                                                                   15.0s
   ✔1c56c3d4ce74 Pull complete                                                                                    0.8s
   ✔90986bb8de6e Pull complete                                                                                    1.4s
   ✔ae71319cb779 Pull complete                                                                                   15.3s
   ✔e9f03a1c24ce Pull complete                                                                                    0.8s
   ✔ffc89e9dfd88 Pull complete                                                                                    2.9s
   ✔20e4dcae4c69 Pull complete                                                                                   14.7s
   ✔68c3898c2015 Pull complete                                                                                   14.9s
   ✔064b2d298fba Pull complete                                                                                    2.0s
   ✔43d05e938198 Pull complete                                                                                   16.9s
[+] Building 34.4s (8/8) FINISHED
 => [internal] load local bake definitions                                                                        0.0s
 => => reading from stdin 530B                                                                                    0.0s
 => [internal] load build definition from Dockerfile                                                              0.1s
 => => transferring dockerfile: 163B                                                                              0.0s
 => [internal] load metadata for docker.io/library/php:7.4-fpm-alpine                                             5.6s
 => [internal] load .dockerignore                                                                                 0.1s
 => => transferring context: 2B                                                                                   0.0s
 => [1/2] FROM docker.io/library/php:7.4-fpm-alpine@sha256:0aeb129a60daff2874c5c70fcd9d88cdf3015b4fb4cc7c3f1a32a2  5.1s
 => => resolve docker.io/library/php:7.4-fpm-alpine@sha256:0aeb129a60daff2874c5c70fcd9d88cdf3015b4fb4cc7c3f1a32a2  0.0s
 => => sha256:9820b782a6282df04c53f7626b7de4fdf19ef69ddff066214efa5b2fc73a739f 18.66kB / 18.66kB                  0.3s
 => => sha256:a9e6097c1efac68e19dae7ae83dd5b74a4fac7b246320168387aa66637b1c901 8.44kB / 8.44kB                    0.6s
 => => sha256:759eb390abda1578a620d6474e5e3affec372d75b89bd83051c5407e6bfe2e71 2.45kB / 2.45kB                    0.9s
 => => sha256:e427679e7c26b1eeeba93df4fdf79a0c08bfc721bc4510195968798bb655456f 11.46MB / 11.46MB                  4.3s
 => => sha256:96243f515dda95b97690b395de3ca9d9acfdb9434602618e0a040bc0419d53d1 496B / 496B                        0.6s
 => => sha256:3b1be5f02bec4a03578bdcd484547818e26c7313d2fb9889428db6718b00850c 10.44MB / 10.44MB                  2.3s
 => => sha256:0e2e66b89284d71ee13c90182fe35d46d2461573064ae7f020aa4c22c1235e2a 267B / 267B                        0.3s
 => => sha256:9d6040f2a28f7fd4288a87be2db7a8886104a1080402d0343e1c527c232d8963 1.26kB / 1.26kB                    2.0s
 => => sha256:1b78b4fe0ca1ca5277d0b56997b3a74ac05ac52ff34cf9d5c6c063bd3feca07e 1.72MB / 1.72MB                    0.4s
 => => sha256:ca7dd9ec2225f2385955c43b2379305acd51543c28cf1d4e94522b3d94cce3ce 2.81MB / 2.81MB                    1.7s
 => => extracting sha256:ca7dd9ec2225f2385955c43b2379305acd51543c28cf1d4e94522b3d94cce3ce                          0.1s
 => => extracting sha256:1b78b4fe0ca1ca5277d0b56997b3a74ac05ac52ff34cf9d5c6c063bd3feca07e                          0.1s
```

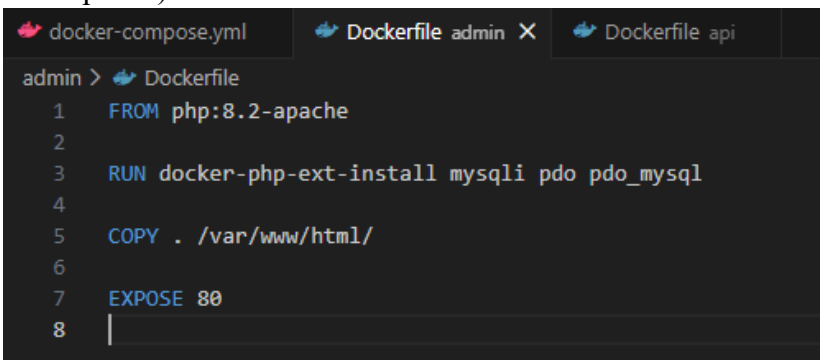
3. Verifikasi Status Container: Pastikan ketiga container (nginx, php, db) sedang berjalan.
    a. Perintah: docker ps

```
PS C:\docker-lemp-praktikum> docker ps
CONTAINER ID   IMAGE                      COMMAND                  CREATED          STATUS          PORTS                                       NAMES
b913e7a2de21   nginx:stable-alpine        "/docker-entrypoint.…"   34 seconds ago   Up 33 seconds   0.0.0.0:8080->80/tcp, [::]:8080->80/tcp     lemp_nginx
7cbb59abf081   docker-lemp-praktikum-php  "docker-php-entrypoi…"   34 seconds ago   Up 34 seconds   9000/tcp                                    lemp_php
4873a24a6c2e   mysql:5.7                  "docker-entrypoint.s…"   34 seconds ago   Up 34 seconds   3306/tcp, 33060/tcp                         lemp_mysql
```

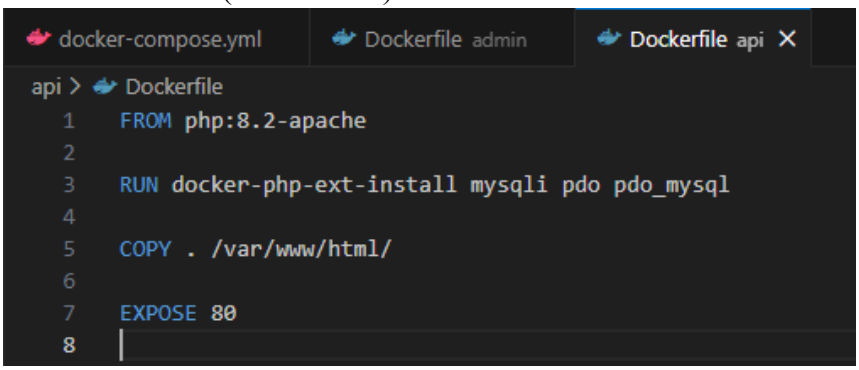
4. Uji Coba di Browser: Akses web server melalui port 8080 yang sudah di-mapping.
    a. Alamat: http://localhost:8080
    b. Jika Anda melihat halaman PHP yang menunjukkan "Koneksi Database Berhasil!", maka seluruh LEMP stack Anda sudah berjalan dengan baik di Docker Desktop.

5. Menghentikan Container: Untuk menghentikan dan membersihkan container serta network saat praktikum selesai:
    a. Perintah: docker-compose down

D. Tugas Praktikum
    a. List service apa saja yang dibutuhkan oleh PBL mu untuk di jalankan didalam docker.
        1. Service Admin (PHP Native + Apache)1. Service Admin (PHP Native + Apache)



        2. Service API (PHP Native)



3. Service Database (MySQL 8)

Menyimpan seluruh data PBL: users, students, lecturers, guidances, schedules, documents, activities, notifications, dll.

b. Buat docker-compose.yml yang sesuai dengan service yang akan kamu gunakan.

```yaml
services:
  admin:
    build:
      context: ./admin
      dockerfile: Dockerfile
    container_name: sigma-admin
    ports:
      - "8080:80"
    depends_on:
      - db

  api:
    build:
      context: ./api
      dockerfile: Dockerfile
    container_name: sigma-api
    ports:
      - "8081:80"
    depends_on:
      - db

  db:
    image: mysql:8.0
    container_name: sigma-db
    restart: always
    environment:
      MYSQL_ROOT_PASSWORD: root
      MYSQL_DATABASE: sigma
      MYSQL_USER: sigma
      MYSQL_PASSWORD: sigma123
    ports:
      - "3307:3306"
    volumes:
      - db_data:/var/lib/mysql

volumes:
  db_data:
```

c. Lakukan uji coba.

1. docker compose up --build

2. Docker compose up -d

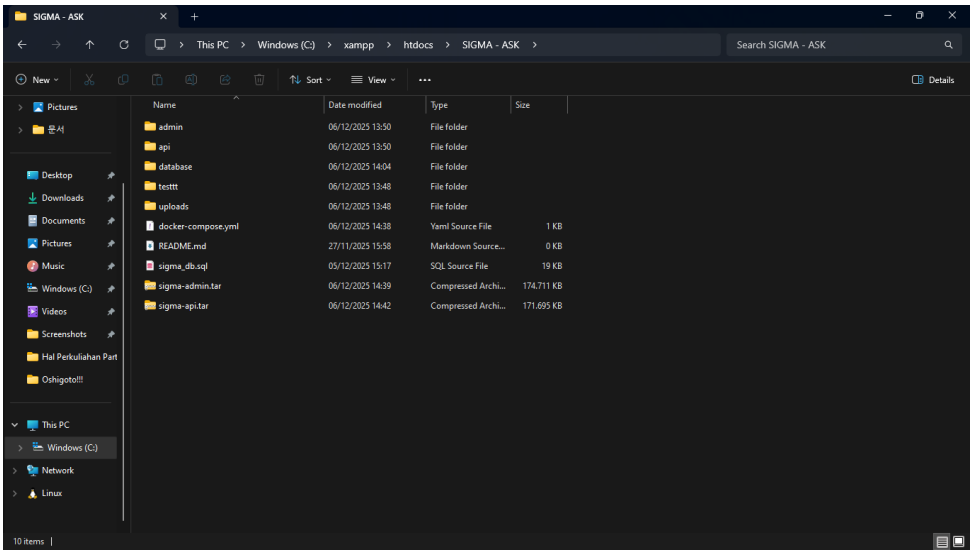
```
time="2025-12-05T21:58:07+07:00" level=warning msg="C:\\xampp\\htdocs\\digita\\SIGMA\\docker-compose.yml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 3/3
 ✔Container sigma-db     Started                                                                                    0.3s
 ✔Container sigma-api    Started                                                                                    0.3s
 ✔Container sigma-admin  Started                                                                                    0.3s
```

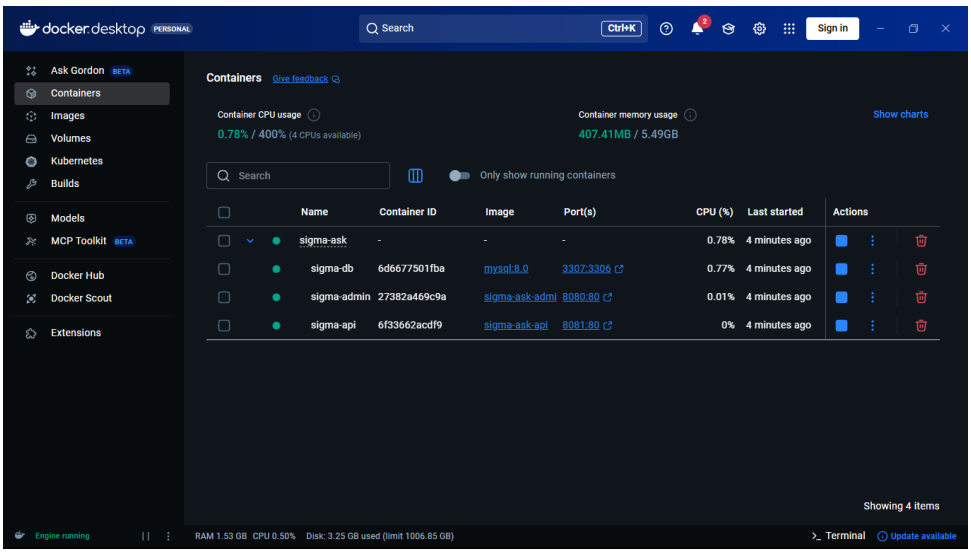
3. Docker ps

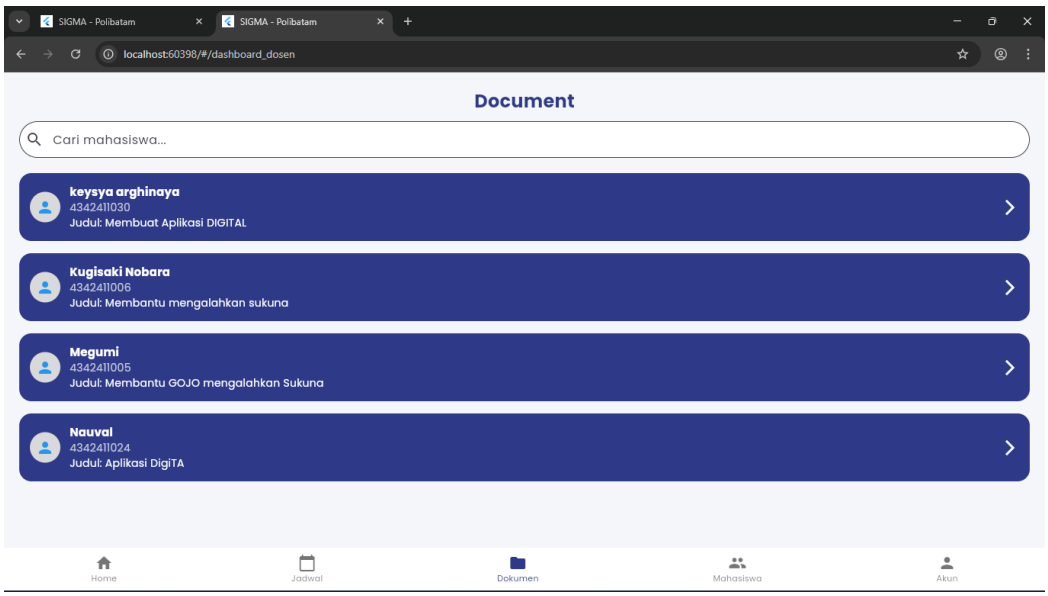
```
C:\xampp\htdocs\digita\SIGMA>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED         STATUS         PORTS                                       NAMES
29a508de5dcd   sigma-admin    "docker-php-entrypoi…"   9 minutes ago   Up 38 seconds  0.0.0.0:8080->80/tcp, [::]:8080->80/tcp     sigma-admin
91fe9be18cba   sigma-api      "docker-php-entrypoi…"   9 minutes ago   Up 38 seconds  0.0.0.0:8081->80/tcp, [::]:8081->80/tcp     sigma-api
428302a8a664   mysql:8.0      "docker-entrypoint.s…"   9 minutes ago   Up 39 seconds  0.0.0.0:3307->3306/tcp, [::]:3307->3306/tcp  sigma-db
```

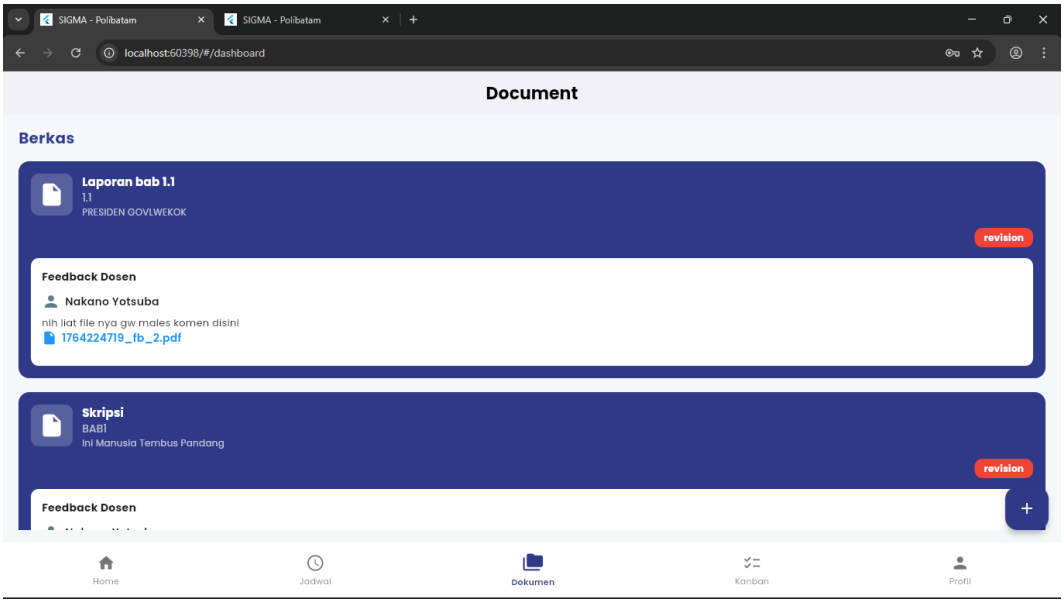
d. Lakukan Eksporting Image Docker agar mudah di pindahkan dan di gunakan di lingkungan pengembangan lain nya. Berikan gambaran hasil dari yang telah dilakukan.

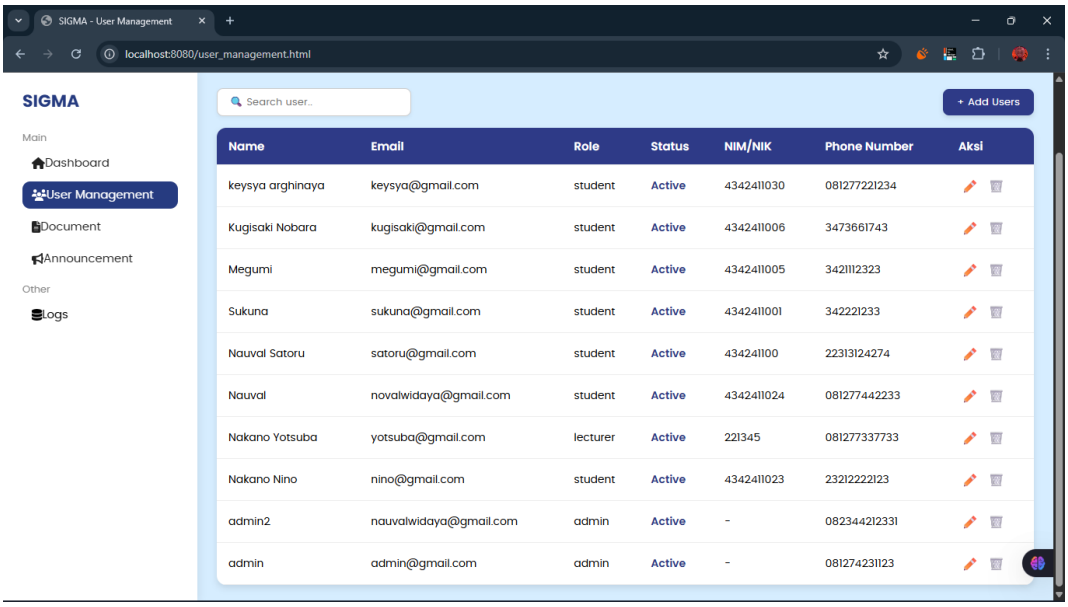
```
C:\xampp\htdocs\SIGMA - ASK>docker save -o sigma-admin.tar sigma-ask-admin

C:\xampp\htdocs\SIGMA - ASK>docker images

IMAGE                     ID             DISK USAGE   CONTENT SIZE   EXTRA
mysql:8.0                 0275a35e79c6       1.06GB          232MB   U
sigma-ask-admin:latest    9e764e77fcc5        714MB          179MB   U
sigma-ask-api:latest      4db1764a4aaa        708MB          176MB   U

C:\xampp\htdocs\SIGMA - ASK>docker save -o sigma-api.tar sigma-ask-api

C:\xampp\htdocs\SIGMA - ASK>
```






SIGMA - Polibatam
SIGMA - Polibatam
localhost:60398/#/dashboard_dosen
Document
Cari mahasiswa...
keysya arghinaya
4342411030
Judul: Membuat Aplikasi DIGITAL
Kugisaki Nobara
4342411006
Judul: Membantu mengalahkan sukuna
Megumi
4342411005
Judul: Membantu GOJO mengalahkan Sukuna
Nauval
4342411024
Judul: Aplikasi DigiTA
Home
Jadwal
Dokumen
Mahasiswa
Akun


SIGMA - Polibatam
SIGMA - Polibatam
localhost:60398/#/dashboard
Document
Berkas
Laporan bab 1.1
1.1
PRESIDEN GOVLWEKOK
revision
Feedback Dosen
Nakano Yotsuba
nih liat file nya gw males komen disini
1764224719_fb_2.pdf
Skripsi
BAB1
Ini Manusia Tembus Pandang
revision
Feedback Dosen
Home
Jadwal
Dokumen
Kanban
Profil


SIGMA - User Management
localhost:8080/user_management.html
SIGMA
Search user..
+ Add Users
Main
Dashboard
User Management
Document
Announcement
Other
Logs
Name
Email
Role
Status
NIM/NIK
Phone Number
Aksi
keysya arghinaya
keysya@gmail.com
student
Active
4342411030
081277221234
Kugisaki Nobara
kugisaki@gmail.com
student
Active
4342411006
3473661743
Megumi
megumi@gmail.com
student
Active
4342411005
3421112323
Sukuna
sukuna@gmail.com
student
Active
4342411001
342221233
Nauval Satoru
satoru@gmail.com
student
Active
434241100
22313124274
Nauval
novalwidaya@gmail.com
student
Active
4342411024
081277442233
Nakano Yotsuba
yotsuba@gmail.com
lecturer
Active
221345
081277337733
Nakano Nino
nino@gmail.com
student
Active
4342411023
23212222123
admin2
nauvalwidaya@gmail.com
admin
Active
-
082344212331
admin
admin@gmail.com
admin
Active
-
081274231123