Nguồn tham khảo: Bezkoder

- Tạo Ứng dụng Springboot làm việc với MySQL

- Tạo file Docker cho ứng dụng Spring Boot

File Docker định nghĩa danh sách các câu lệnh sử dụng cho việc thiết lập môi trường cho ứng dụng SpringBoot.

bezkoder-app/*Dockerfile*

```
# FROM maven:3.8.2-jdk-8 # for Java 8
FROM maven:3.8.5-openjdk-17

WORKDIR /bezkoder-app
COPY . .
RUN mvn clean install

CMD mvn spring-boot:run
```

Giải thích:

+ FROM: cài đặt image Maven – JDK Version

+ WORKDIR: đường dẫn thư mục làm việc

+ COPY: Copy tất cả các tập tin trong thư mục dự án để đưa vào container

+ RUN: thực thi một câu lệnh bên trong container: **mvn clean install** để cài đặt tất cả các dependencies trong file pom.xml

- Viết cấu hình Docker trong file YAML

Write Docker Compose configurations

Trong thư mục gốc, chúng ta sẽ tạo một file docker-compose.yml file. Version 3

```
version: '3.8'

services:
    mysqldb:
    app:

volumes:
```

Đầy đủ:

```
version: "3.8"

services:
  mysqldb:
    image: mysql:5.7
    restart: unless-stopped
    env_file: ./.env
    environment:
      - MYSQL_ROOT_PASSWORD=$MYSQLDB_ROOT_PASSWORD
      - MYSQL_DATABASE=$MYSQLDB_DATABASE
    ports:
      - $MYSQLDB_LOCAL_PORT:$MYSQLDB_DOCKER_PORT
    volumes:
      - db:/var/lib/mysql
  app:
    depends_on:
      - mysqldb
    build: ./bezkoder-app
    restart: on-failure
    env_file: ./.env
    ports:
      - $SPRING_LOCAL_PORT:$SPRING_DOCKER_PORT
    environment:
      SPRING_APPLICATION_JSON: '{
        "spring.datasource.url"  : "jdbc:mysql://mysqldb:$MYSQLDB_DOCKER_PORT/$MYSQLDB_DATABASE?useSSL=false",
        "spring.datasource.username" : "$MYSQLDB_USER",
        "spring.datasource.password" : "$MYSQLDB_ROOT_PASSWORD",
        "spring.jpa.properties.hibernate.dialect" : "org.hibernate.dialect.MySQL5InnoDBDialect",
        "spring.jpa.hibernate.ddl-auto" : "update"
      }'
    volumes:
      - .m2:/root/.m2
    stdin_open: true
    tty: true

volumes:
  db:
```

Giải thích:

- `version` : Docker Compose file format version will be used.
- `services` : individual services in isolated containers. Our application has two services: `app` (Spring Boot) and `mysqldb` (MySQL database).
- `volumes` : named volumes that keeps our data alive after restart.

– **mysqldb**:

- `image` : official Docker image
- `restart` : configure the restart policy
- `env_file` : specify our *.env* path that we will create later
- `environment` : provide setting using environment variables
- `ports` : specify ports will be used
- `volumes` : map volume folders

– **app**:

- `depends_on` : dependency order, **mysqldb** is started before **app**
- `build` : configuration options that are applied at build time that we defined in the *Dockerfile* with relative path
- `environment` : environmental variables that Spring Boot application uses
- `stdin_open` and `tty` : keep open the terminal after building container

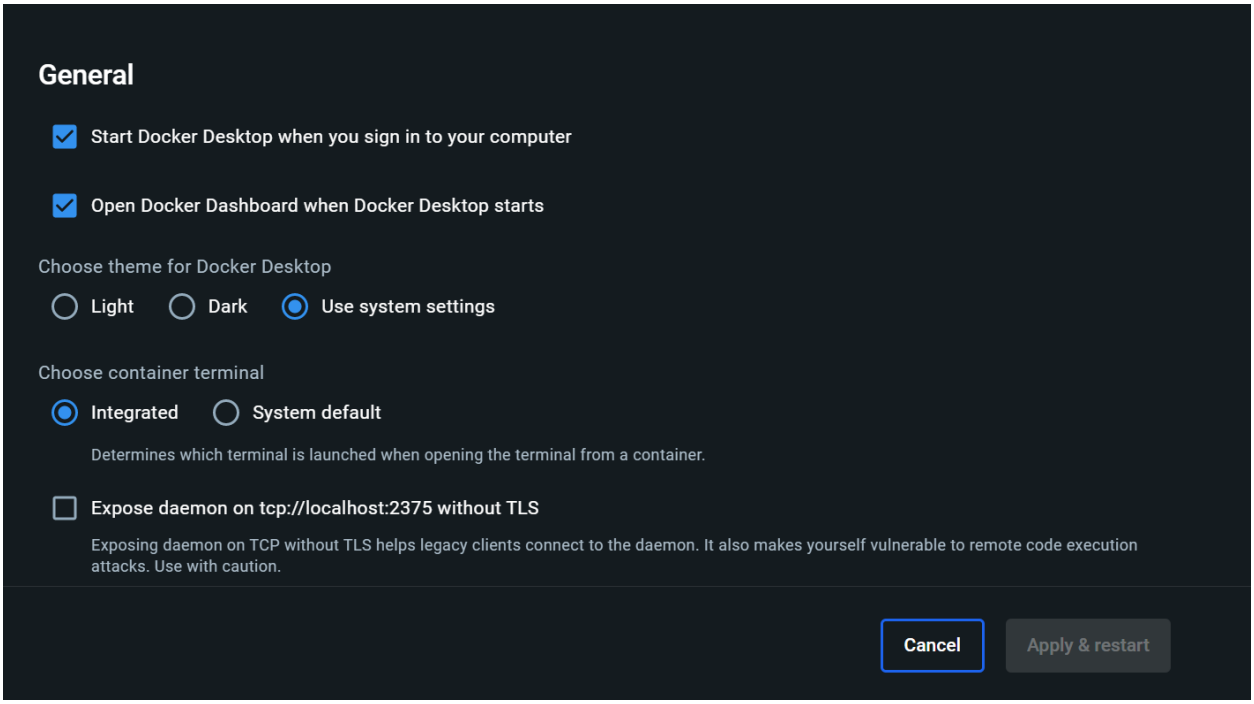
Chú ý: LOCAL_PORT và DOCKER_PORT là khác nhau

Tạo biến môi trường trong file .env

```
MYSQLDB_USER=root
MYSQLDB_ROOT_PASSWORD=123456
MYSQLDB_DATABASE=bezkoder_db
MYSQLDB_LOCAL_PORT=3307
MYSQLDB_DOCKER_PORT=3306

SPRING_LOCAL_PORT=6868
SPRING_DOCKER_PORT=8080
```

Nhập đúng theo Username và Password (Có thể thay đổi)




```
D:\docker-compose-spring-boot-mysql-master>docker compose up -d
[+] Running 12/12
 ✓ mysqldb 11 layers [⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿⣿]      0B/0B      Pulled                                                    28.1s
   ✓ 20e4dcae4c69 Pull complete                                                                                  10.0s
   ✓ 1c56c3d4ce74 Pull complete                                                                                   1.2s
   ✓ e9f03a1c24ce Pull complete                                                                                   1.5s
   ✓ 68c3898c2015 Pull complete                                                                                   4.7s
   ✓ 6b95a940e7b6 Pull complete                                                                                   3.2s
   ✓ 90986bb8de6e Pull complete                                                                                   4.7s
   ✓ ae71319cb779 Pull complete                                                                                  13.2s
   ✓ ffc89e9dfd88 Pull complete                                                                                   6.2s
   ✓ 43d05e938198 Pull complete                                                                                  16.9s
   ✓ 064b2d298fba Pull complete                                                                                  11.7s
   ✓ df9a4d85569b Pull complete                                                                                  13.3s
[+] Building 92.0s (8/9)                                                                                docker:default
 => => sha256:ccc287cbeddc96a0772397ca00ec85482a7b7f9a9fac643bfddd87b932f743db 54.57MB / 54.57MB               16.3s
 => => sha256:39a2961e8351d92060fe0b7d3182dd4725fada0faa44b805531195caf32cb6cc 5.42MB / 5.42MB                 12.3s
 => => sha256:a12df774715e16cd39a0150faf0f8a71d1f36c768641e1d731f926d03a6b0f38 212B / 212B                     13.4s
 => => extracting sha256:df5590a8898bedd76f02205dc8caa5cc9863267dbcd8aac038bcd212688c1cc7                       5.4s
 => => sha256:08f28107b8b305dfeb6245a285f49bb9b260900c5f8c41a7092796d91ddd6ae8 105.99MB / 105.99MB             27.9s
 => => sha256:fd9e28083df05481ede91e85cc939b1489848dae5bab8049fea037f9ededbf2a 9.41MB / 9.41MB                 18.5s
 => => sha256:18282f3f5e4a2ed01c9adc6337faf07aff04d955ba06ca8cae4136de9c0dc0c3 854B / 854B                     17.7s
 => => extracting sha256:705bb4cb554eb7751fd21a994f6f32aee582fbe5ea43037db6c43d321763992b                       0.5s
 => => sha256:dc57f652f3140b3dc8247433ae661209decadf530204ee3359f496bc8633c2e1 361B / 361B                     18.5s
```

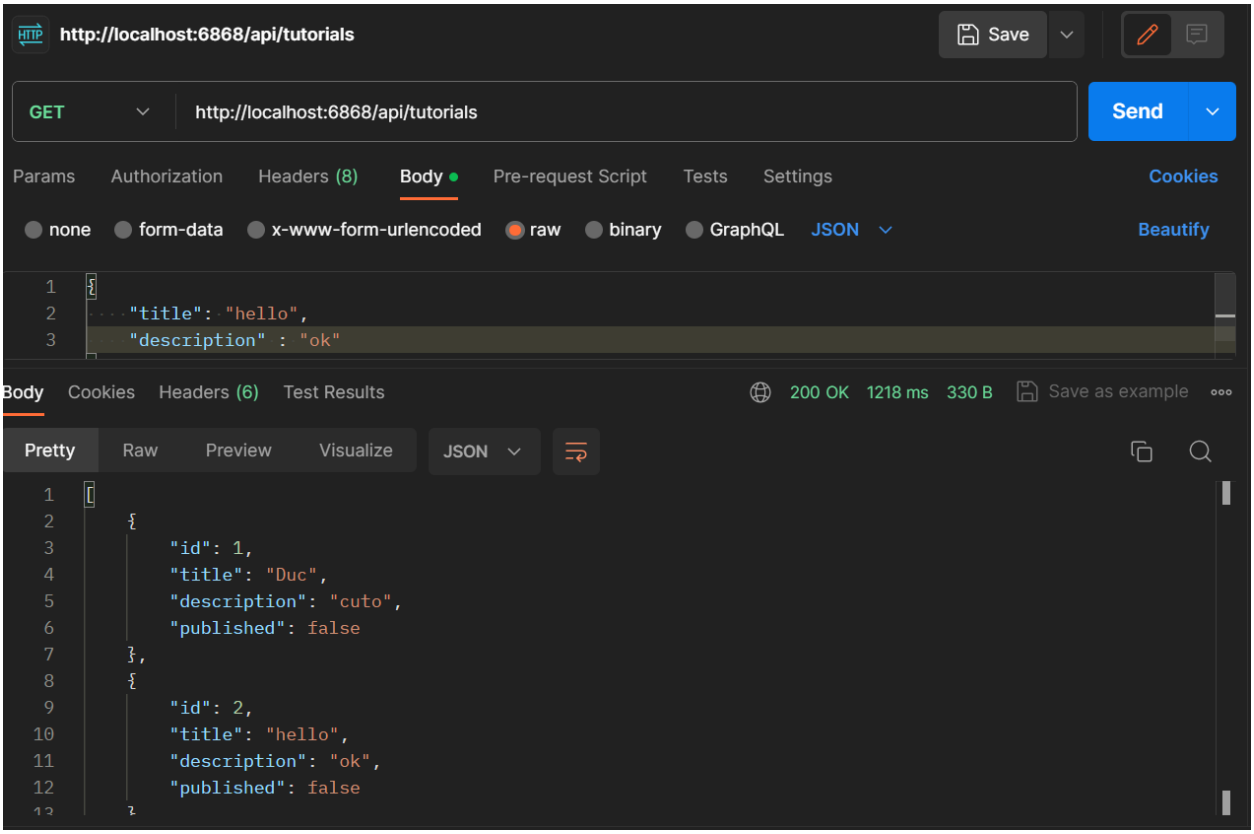
- Kiểm tra container đang chứa gì ở hiện tại: docker ps

```
D:\docker-compose-spring-boot-mysql-master>docker ps
CONTAINER ID   IMAGE                                      COMMAND                  CREATED              STATUS
              PORTS                     NAMES
bd02814a9e8b   docker-compose-spring-boot-mysql-master-app   "/usr/local/bin/mvn-…"   About a minute ago   Up About a mi
nute              0.0.0.0:6868->8080/tcp   docker-compose-spring-boot-mysql-master-app-1
331e6fabce00   mysql:5.7                                  "docker-entrypoint.s…"   About a minute ago   Restarting (1
) 27 seconds ago                           docker-compose-spring-boot-mysql-master-mysqldb-1
```

- Hoặc docker images:

```
D:\docker-compose-spring-boot-mysql-master>docker images
REPOSITORY                                      TAG       IMAGE ID       CREATED          SIZE
docker-compose-spring-boot-mysql-master-app     latest    66ddc12bc569   5 minutes ago    684MB
duc894580/springboot-docker                     v1.0.0    03bbdb494311   3 days ago       578MB
mysql                                           5.7       5107333e08a8   9 days ago       501MB
mysql                                           8.0.28    f2ad9f23df82   20 months ago    521MB
```

```
D:\docker-compose-spring-boot-mysql-master\bezkoder-app>docker logs f7bb4b6a304c
[INFO] Scanning for projects...
[INFO]
[INFO] -----------------< com.bezkoder:spring-boot-data-jpa >------------------
[INFO] Building spring-boot-data-jpa 0.0.1-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
[INFO]
[INFO] >>> spring-boot-maven-plugin:2.2.1.RELEASE:run (default-cli) > test-compile @ spring-boot-data-jpa >>>
[INFO]
[INFO] --- maven-resources-plugin:3.1.0:resources (default-resources) @ spring-boot-data-jpa ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /bezkoder-app/src/main/resources
[INFO] skip non existing resourceDirectory /bezkoder-app/src/main/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ spring-boot-data-jpa ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:3.1.0:testResources (default-testResources) @ spring-boot-data-jpa ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /bezkoder-app/src/test/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ spring-boot-data-jpa ---
[INFO] No sources to compile
[INFO]
[INFO] <<< spring-boot-maven-plugin:2.2.1.RELEASE:run (default-cli) < test-compile @ spring-boot-data-jpa <<<
[INFO]
[INFO]
[INFO] --- spring-boot-maven-plugin:2.2.1.RELEASE:run (default-cli) @ spring-boot-data-jpa ---
[INFO] Attaching agents: []
```



bash Copy code

```
docker-compose logs mysqldb
docker-compose logs app
```

If you need to stop and remove all containers, networks, and all images used by any service in *docker-compose.yml* file, use the command:
`docker compose down --rmi all`