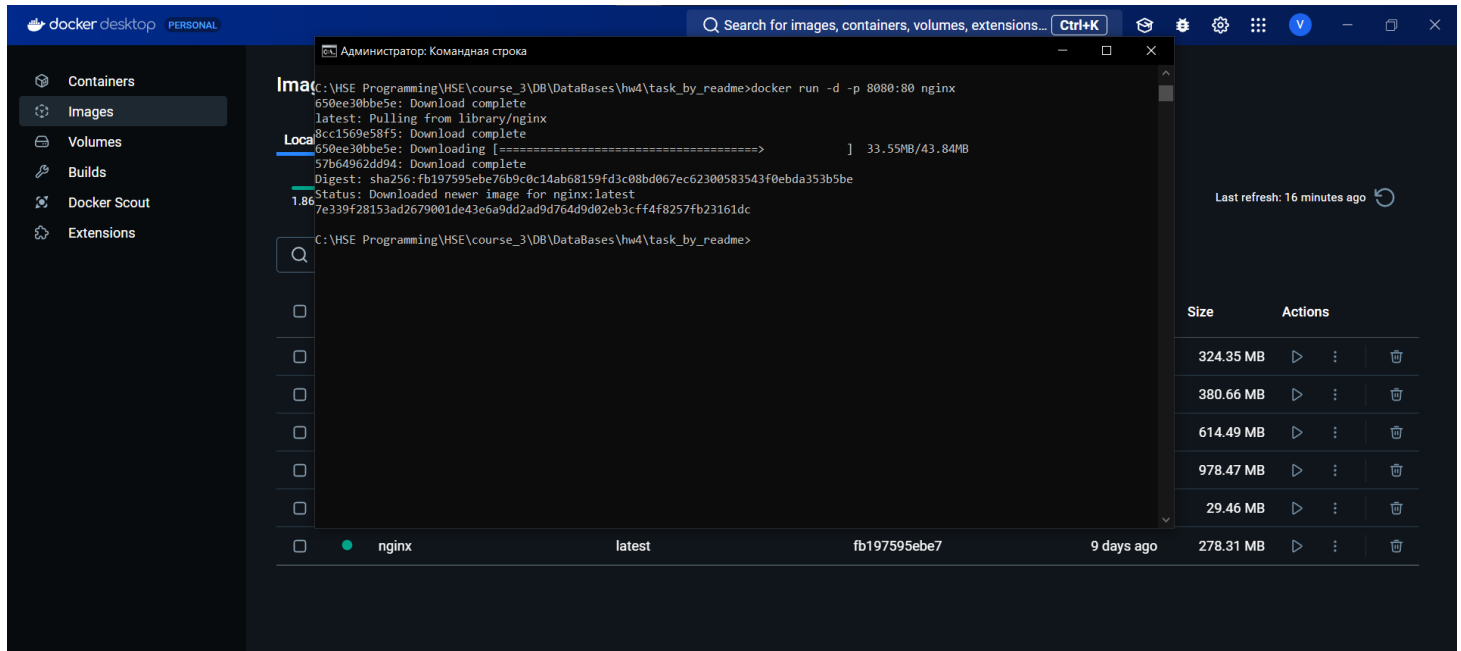


# Задание семинара 4

Лим В. БПИ225

## 1. Основные команды Docker и типы образов

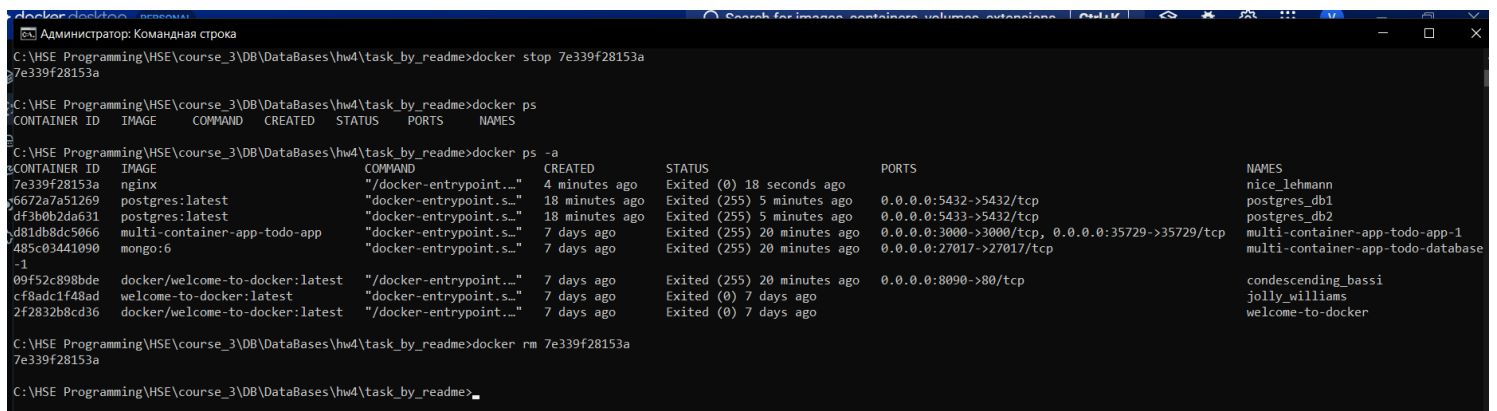
### 1.1 Запуск контейнера:



```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS                               NAMES
7e339f28153a   nginx    "/docker-entrypoint.s..." About a minute ago Up About a minute 0.0.0.0:8080->80/tcp nice_lehm ann

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>
```

### 1.2 Остановка и удаление контейнера:



### 1.3 Виды образов:

Alpine:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker run -d -p 5432:5432 -e "POSTGRES_PASSWORD=password" postgres:alpine
Unable to find image 'postgres:alpine' locally
alpine: Pulling from library/postgres
e51a59271ee0: Download complete
572c54261b6d: Download complete
788f9103b422: Download complete
628d1767b54a: Download complete
0ab9846b934e: Download complete
e0e32a3e0983: Download complete
af24098c3ecb: Download complete
471e062306b2: Download complete
5010a4f3c1ea: Download complete
Digest: sha256:e7897baa70dae1968d23d785adb4aeb699175e0bcaae44f98a7083ecb9668b93
Status: Downloaded newer image for postgres:alpine
496fba34c662ff3179dc9a971f2e9d63c3a66ad71debac2e1d54938c65b859cf

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>
```

Обычный:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker run -d -p 5433:5432 -e "POSTGRES_PASSWORD=password" postgres:latest
86b1797ed94ba3ce871aa95065e536d6e9d2a8e80e5dd3eef08600f25b3d3cab

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED        STATUS        PORTS                               NAMES
86b1797ed94b   postgres:latest "docker-entrypoint.s..." 8 seconds ago   Up 7 seconds   0.0.0.0:5433->5432/tcp             laughing_hawking
496fba34c662   postgres:alpine "docker-entrypoint.s..." About a minute ago   Up About a minute   0.0.0.0:5432->5432/tcp             distracted_sanderson

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>
```

Логи для обычного образа:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker logs -f 86b1797ed94b
The files belonging to this database system will be owned by user "postgres".
This user must also own the server process.

The database cluster will be initialized with locale "en_US.utf8".
The default database encoding has accordingly been set to "UTF8".
The default text search configuration will be set to "english".

Data page checksums are disabled.

fixing permissions on existing directory /var/lib/postgresql/data ... ok
creating subdirectories ... ok
selecting dynamic shared memory implementation ... posix
selecting default "max_connections" ... 100
selecting default "shared_buffers" ... 128MB
selecting default time zone ... Etc/UTC
creating configuration files ... ok
running bootstrap script ... ok
performing post-bootstrap initialization ... ok
initdb: warning: enabling "trust" authentication for local connections
initdb: hint: You can change this by editing pg_hba.conf or using the option -A, or --auth-local and --auth-host, the next time you run initdb.
syncing data to disk ... ok

Success. You can now start the database server using:

    pg_ctl -D /var/lib/postgresql/data -l logfile start

waiting for server to start....2024-12-05 17:32:09.634 UTC [49] LOG:  starting PostgreSQL 17.2 (Debian 17.2-1.pgdg120+1) on x86_64-pc-linux-gnu, compiled by gcc (Debian 12.2.0-14) 12.2.0, 64-bit
2024-12-05 17:32:09.637 UTC [49] LOG:  listening on Unix socket "/var/run/postgresql/.s.PGSQL.5432"
2024-12-05 17:32:09.642 UTC [52] LOG:  database system was shut down at 2024-12-05 17:32:09 UTC
2024-12-05 17:32:09.646 UTC [49] LOG:  database system is ready to accept connections
done
server started

/usr/local/bin/docker-entrypoint.sh: ignoring /docker-entrypoint-initdb.d/*

2024-12-05 17:32:09.777 UTC [49] LOG:  received fast shutdown request
waiting for server to shut down....2024-12-05 17:32:09.780 UTC [49] LOG:  aborting any active transactions
2024-12-05 17:32:09.781 UTC [49] LOG:  background worker "logical replication launcher" (PID 55) exited with exit code 1
2024-12-05 17:32:09.781 UTC [50] LOG:  shutting down
2024-12-05 17:32:09.783 UTC [50] LOG:  checkpoint starting: shutdown immediate
2024-12-05 17:32:09.795 UTC [50] LOG:  checkpoint complete: wrote 3 buffers (0.0%); 0 WAL file(s) added, 0 removed, 0 recycled; write=0.004 s, sync=0.002 s, total=0.014 s; sync files=2, longest=0.001 s, average=
0.001 s; distance=0 kB, estimate=0 kB; lsn=0/14E4FA0, redo lsn=0/14E4FA0
2024-12-05 17:32:09.797 UTC [49] LOG:  database system is shut down
done
server stopped

PostgreSQL init process complete; ready for start up.
```

Логи для Alpine образа:

```

[6] Администратор: Командная строка - docker logs -f 496fba34c662
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker logs -f 496fba34c662
The files belonging to this database system will be owned by user "postgres".
This user must also own the server process.

The database cluster will be initialized with locale "en_US.utf8".
The default database encoding has accordingly been set to "UTF8".
The default text search configuration will be set to "english".

Data page checksums are disabled.

fixing permissions on existing directory /var/lib/postgresql/data ... ok
creating subdirectories ... ok
selecting dynamic shared memory implementation ... posix
selecting default "max_connections" ... 100
selecting default "shared_buffers" ... 128MB
selecting default time zone ... UTC
creating configuration files ... ok
running bootstrap script ... ok
sh: locale: not found
2024-12-05 17:31:11.805 UTC [35] WARNING: no usable system locales were found
performing post-bootstrap initialization ... ok
initdb: warning: enabling "trust" authentication for local connections
initdb: hint: You can change this by editing pg_hba.conf or using the option -A, or --auth-local and --auth-host, the next time you run initdb.
syncing data to disk ... ok

Success. You can now start the database server using:

    pg_ctl -D /var/lib/postgresql/data -l logfile start

waiting for server to start....2024-12-05 17:31:12.303 UTC [41] LOG: starting PostgreSQL 17.2 on x86_64-pc-linux-musl, compiled by gcc (Alpine 13.2.1_git20240309) 13.2.1 20240309, 64-bit
2024-12-05 17:31:12.306 UTC [41] LOG: listening on Unix socket "/var/run/postgresql/.s.PGSQL.5432"
2024-12-05 17:31:12.312 UTC [44] LOG: database system was shut down at 2024-12-05 17:31:12 UTC
2024-12-05 17:31:12.316 UTC [41] LOG: database system is ready to accept connections
done
server started

/usr/local/bin/docker-entrypoint.sh: ignoring /docker-entrypoint-initdb.d/*

waiting for server to shut down....2024-12-05 17:31:12.397 UTC [41] LOG: received fast shutdown request
2024-12-05 17:31:12.402 UTC [41] LOG: aborting any active transactions
2024-12-05 17:31:12.404 UTC [41] LOG: background worker "logical replication launcher" (PID 47) exited with exit code 1
2024-12-05 17:31:12.404 UTC [42] LOG: shutting down
2024-12-05 17:31:12.407 UTC [42] LOG: checkpoint starting: shutdown immediate
2024-12-05 17:31:12.419 UTC [42] LOG: checkpoint complete: wrote 3 buffers (0.0%); 0 WAL file(s) added, 0 removed, 0 recycled; write=0.004 s, sync=0.002 s, total=0.016 s; sync files=2, longest=0.001 s, average=0.001 s; distance=0 kB, estimate=0 kB; lsn=0/14EAC68, redo lsn=0/14EAC68
2024-12-05 17:31:12.422 UTC [41] LOG: database system is shut down
done
server stopped

PostgreSQL init process complete; ready for start up.

2024-12-05 17:31:12.517 UTC [1] LOG: starting PostgreSQL 17.2 on x86_64-pc-linux-musl, compiled by gcc (Alpine 13.2.1_git20240309) 13.2.1 20240309, 64-bit

```

## Сравнение образов:

```

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker images
REPOSITORY          TAG         IMAGE ID      CREATED        SIZE
multi-container-app  latest     a8e76ca2c772  7 days ago    324MB
welcome-to-docker   latest     8ca3f27af9f2  7 days ago    381MB
nginx               latest     fb197595ebe7  8 days ago    278MB
postgres            alpine     e7897baa70da  13 days ago    363MB
postgres            latest     fe4efc6901dd  13 days ago    614MB
mongo               6          b77a33b3fc20  5 weeks ago   978MB
docker/welcome-to-docker latest     eedaff45e3c7  13 months ago 29.5MB

```

## Остановка и удаление:

```

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker stop 86b1797ed94b
86b1797ed94b

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker stop 496fba34c662
496fba34c662

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker rm 496fba34c662
496fba34c662

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker rm 86b1797ed94b
86b1797ed94b

```

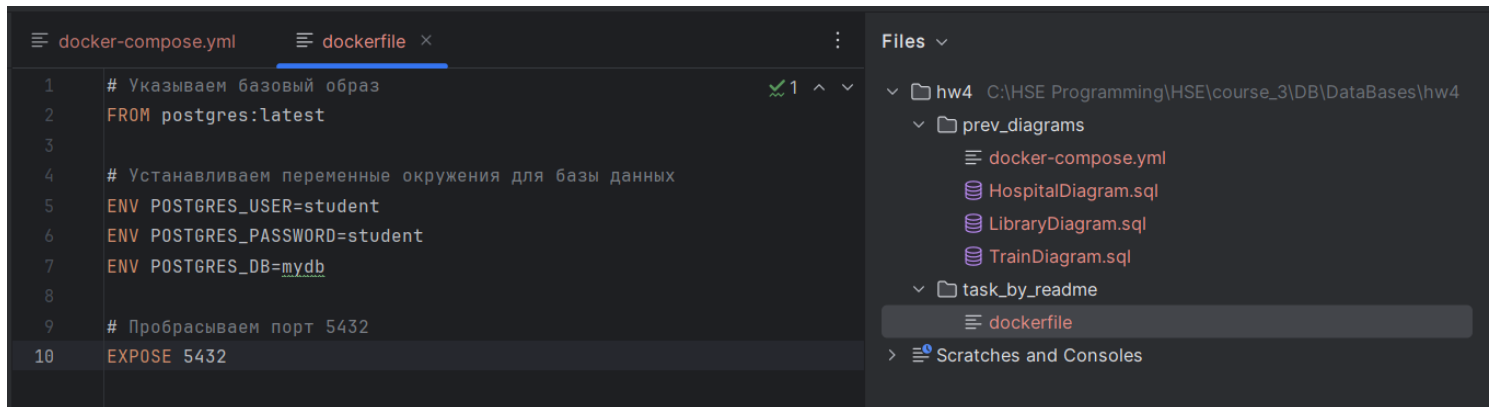
## 1.4 Заходим в контейнер:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker exec -it 99138b208715 bash
99138b208715:/# psql
psql: error: connection to server on socket "/var/run/postgresql/.s.PGSQL.5432" failed: FATAL: role "root" does not exist
99138b208715:/#
What's next:
Try Docker Debug for seamless, persistent debugging tools in any container or image → docker debug 99138b208715
Learn more at https://docs.docker.com/go/debug-cli/
```

## 1.5 Выполнил выше базовые команды.

## 2. Создание Dockerfile для PostgreSQL

### 2.1 Создание простого Dockerfile:



### 2.2 Собираем образ:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker build -t my_postgres .
[+] Building 2.2s (6/6) FINISHED
=> [internal] load build definition from dockerfile
=> => transferring dockerfile: 345B
=> WARN: SecretsUsedInArgOrEnv: Do not use ARG or ENV instructions for sensitive data (ENV "POSTGRES_PASSWORD") (line 6)
=> [internal] load metadata for docker.io/library/postgres:latest
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/1] FROM docker.io/library/postgres:latest@sha256:fe4efc6901dda0d952306fd962643d8022d7bb773ffe13fe8a21551b9276e50c
=> => resolve docker.io/library/postgres:latest@sha256:fe4efc6901dda0d952306fd962643d8022d7bb773ffe13fe8a21551b9276e50c
=> [auth] library/postgres:pull token for registry-1.docker.io
=> exporting to image
=> => exporting layers
=> => exporting manifest sha256:2aefd25013d9154e462d67e86df8eee51e1a63c206b387870b99b19552f52409
=> => exporting config sha256:fd20431f79ce39ddd65de5878655e0eee414320d3d81426a69075ff3c793adb9
=> => exporting attestation manifest sha256:bb733590b53e12f029be7a824a4e83b36ecb555bc3f7e30e560b0d2975cb7b74
=> => exporting manifest list sha256:e2081150f17adbcb31be00a385638303c7fbb9fa638f5aac1b92503be2bbf44b
=> => naming to docker.io/library/my_postgres:latest
=> => unpacking to docker.io/library/my_postgres:latest

1 warning found (use docker --debug to expand):
- SecretsUsedInArgOrEnv: Do not use ARG or ENV instructions for sensitive data (ENV "POSTGRES_PASSWORD") (line 6)

What's next:
View a summary of image vulnerabilities and recommendations → docker scout quickview

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>
```

### 2.3 Запускаем контейнер:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker run -d -p 5432:5432 my_postgres
33f91833490821adc7af37f712587ce2e5533d8291a92eed07213f5118905810
```

### 2.4 Тегируем образ и пушим его на Docker Hub:

```

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker tag my_postgres vladlim/my_postgres:latest

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker login
Authenticating with existing credentials...
Login Succeeded

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker push vladlim/my_postgres
Using default tag: latest
The push refers to repository [docker.io/vladlim/my_postgres]
a24f300391ed: Waiting
8f152c4aceed: Waiting
8d4265d09d9c: Waiting
bc0965b23a04: Waiting
e3a8293e92fd: Waiting
67c5fe618f0c: Waiting
5a1745295c1f: Waiting
002e1a8eb6f9: Waiting
2cb801c39436: Waiting
2cd360f3b7db: Waiting
9e592465b243: Waiting
cfb3c2203f88: Waiting
c9cdd1fe82e4: Waiting
c5fdb20d8658: Waiting
627f580b7ad7: Waiting
server message: insufficient_scope: authorization failed

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>

```

<input type="checkbox"/>	Name	Tag	Image ID	Created	Size	Actions		
<input type="checkbox"/>	multi-container-app-todo-app	latest	a8e76ca2c772	7 days ago	324.35 MB	▶	:	🗑
<input type="checkbox"/>	welcome-to-docker	latest	8ca3f27af9f2	7 days ago	380.66 MB	▶	:	🗑
<input type="checkbox"/>	postgres	latest	fe4efc6901dd	14 days ago	614.49 MB	▶	:	🗑
<input type="checkbox"/>	mongo	6	b77a33b3fc20	1 month ago	978.47 MB	▶	:	🗑
<input type="checkbox"/>	docker/welcome-to-docker	latest	eedaff45e3c7	1 year ago	29.46 MB	▶	:	🗑
<input type="checkbox"/>	nginx	latest	fb197595ebe7	9 days ago	278.31 MB	▶	:	🗑
<input type="checkbox"/>	postgres	alpine	e7897baa70da	14 days ago	362.99 MB	▶	:	🗑
<input type="checkbox"/>	my_postgres	latest	e2081150f17a	14 days ago	614.49 MB	▶	:	🗑
<input type="checkbox"/>	vladlim/my_postgres	latest	e2081150f17a	14 days ago	614.49 MB	▶	:	🗑

### 3. Multi-stage build

#### 3.1 Создание Dockerfile с multi-stage build:

docker-compose.yml

dockerfile x

1

2

3

4

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10

# Этап 1: сборка приложения

FROM node:alpine as builder

WORKDIR /app

COPY . .

RUN npm install && npm run build

# Этап 2: финальный минимальный образ

FROM nginx:alpine

COPY --from=builder /app/build /usr/share/nginx/html

EXPOSE 80

Files

hw4 C:\HSE Programming\HSE\course\_3\DB\DataBases\hw4

prev\_diagrams

docker-compose.yml

HospitalDiagram.sql

LibraryDiagram.sql

TrainDiagram.sql

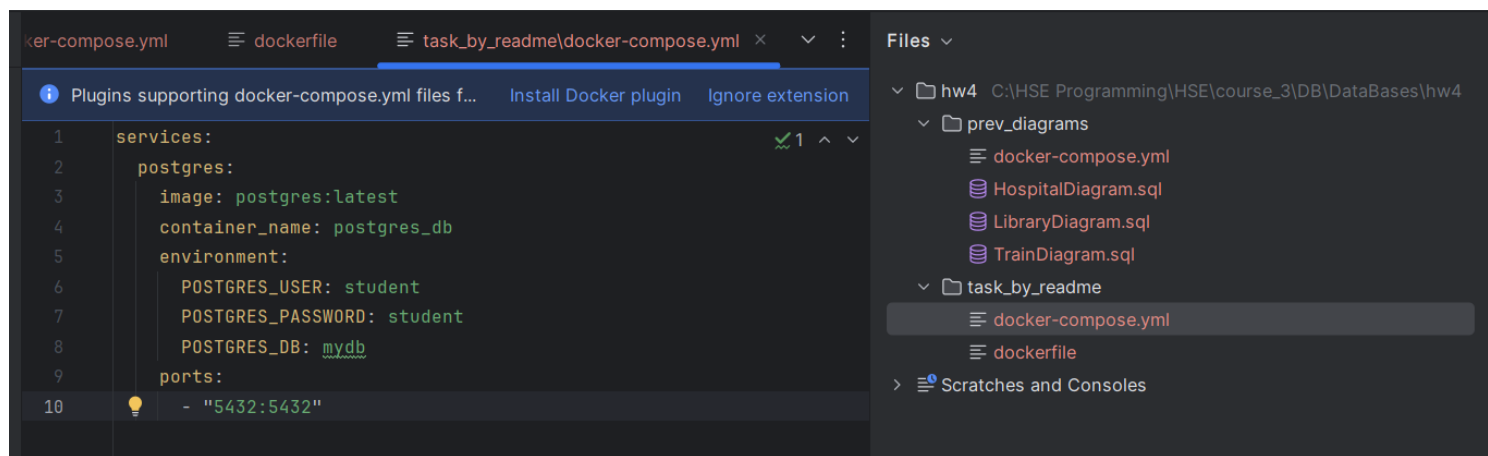
task\_by\_readme

dockerfile

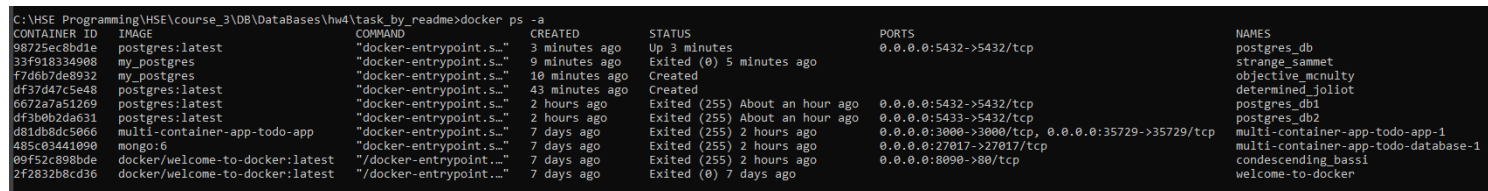
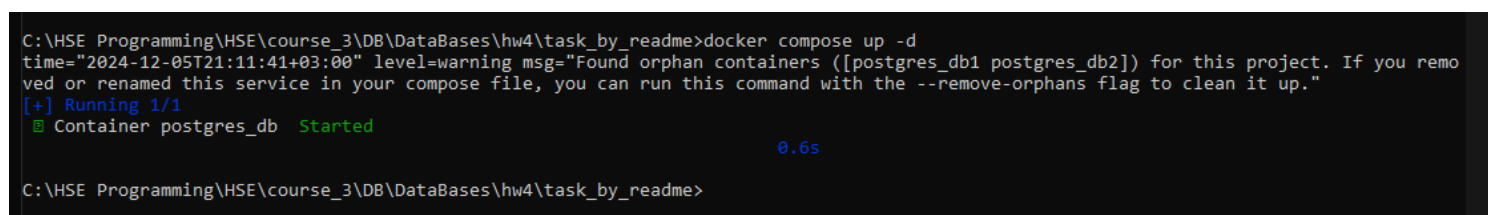
Scratches and Consoles

### 4. Работа с Docker Compose

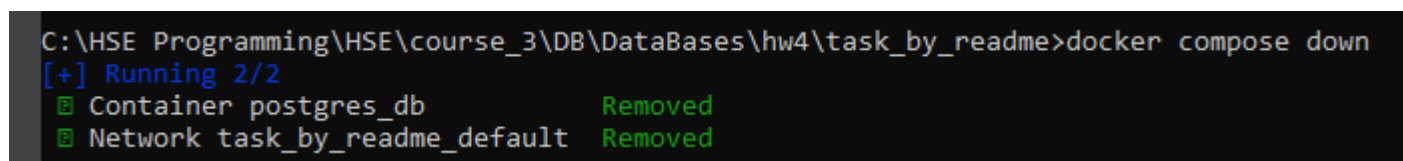
## 4.1 Создание docker-compose.yml:



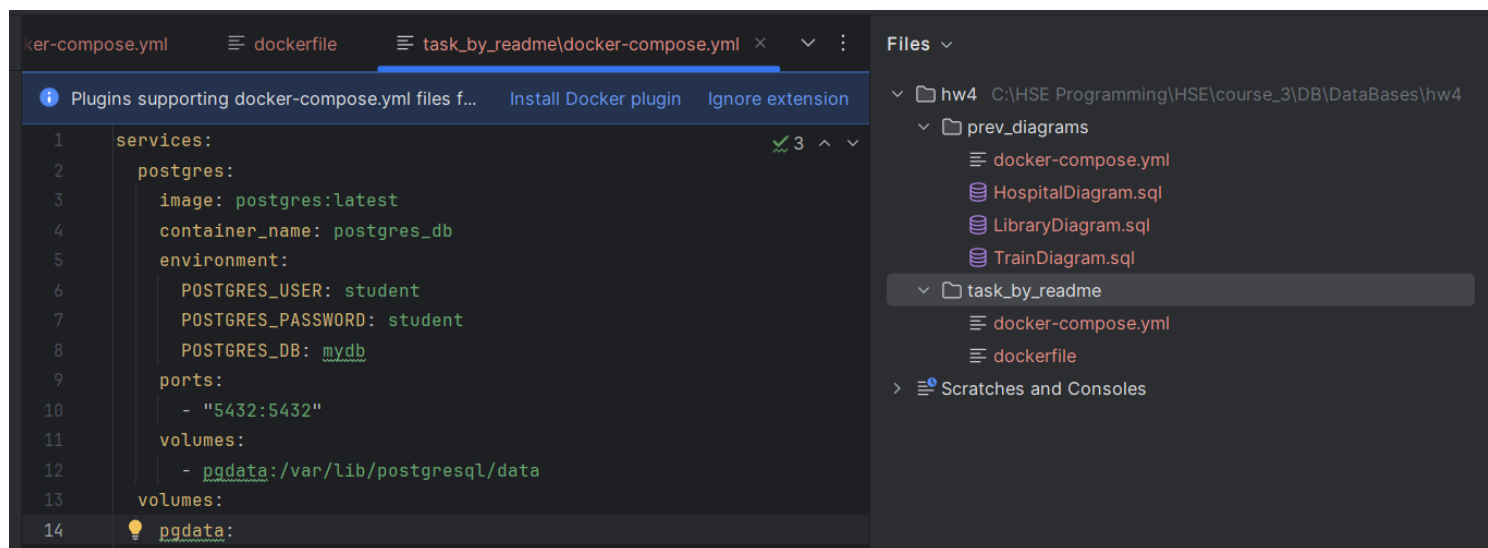
## 4.2 Запуск контейнеров:



## 4.3 Остановка и удаление контейнеров:



## 4.4 Управление volume:





## 4.5 Volume:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker volume ls
DRIVER      VOLUME NAME
local       3e2078de06293086315dcf7b2061800566d0c584c66e9f4a80289e41694cb4b3
local       6b932ccba60ae98a3422e3f923acb83c708e6fc1064d455f88eae0934403f9ce
local       53a3f9e6d4f10f9eeb9a8599303e51d739704a654d2c75216a894cf2d867210a
local       80b5c8a49c0fb006198c8a1b7fd4fd9c550c567f94c7aa8ddc239a32700b18bc
local       00822f17c518ee285cbbd2e6dd2faa5c95efcc25d4c0536aab31476efc929db6
local       888baf46aec8f8646c8d01d8e2b9949f36814fb4ac02eddca67bd81db767b14e
local       ac947a8df09ee57b5844bcfe7e3fd791b0e9d968f696fcad057bc9c8cd893963
local       b39692cdeacdca0253ec423e0d4731548518c9113b22f44330d1f9f902b34b75
local       db5834506b8be936062b360bb65db75e03e7ae21fe91482a12a3361210984580
local       f5bf2b652397779e6830b56970a93a218e27174d300cf7b79664ebaddc7c15df
local       task_by_readme_postgres_data
local       task_by_readme_postgres_data2

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>
```

## 4.6 Управление сетями:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker compose up -d
time="2024-12-05T21:20:55+03:00" level=warning msg="Found orphan containers ([postgres_db1 postgres_db2]) for this project. If you removed
or renamed this service in your compose file, you can run this command with the --remove-orphans flag to clean it up."
[+] Running 2/2
  Network task_by_readme_app_network   Created                                0.0s
  Container task_by_readme-postgres-1 Started                                0.5s

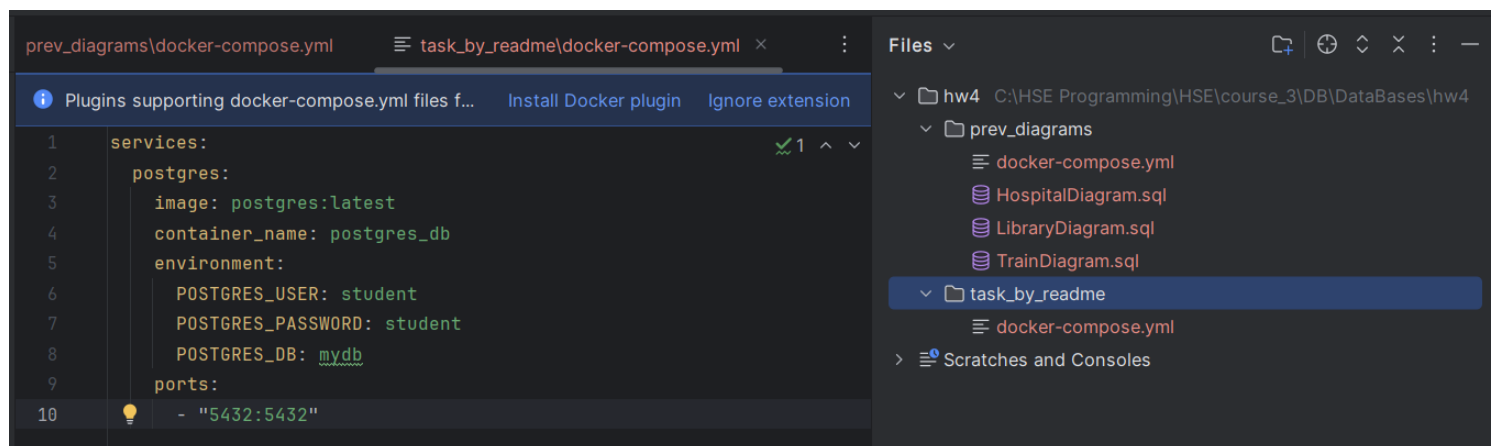
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker network ls
NETWORK ID   NAME                                DRIVER  SCOPE
efd39e9e196c bridge                            bridge  local
7eba7b63ce2b host                             host    local
89c1c9a0d90e multi-container-app_default        bridge  local
b16f24dc88b2 none                             null    local
7e7653dab204 task_by_readme_app_network         bridge  local

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>
```

# 5. Подключение к PostgreSQL через DataGrip

## 5.1 Подключение к PostgreSQL через DataGrip:

Создаем docker-compose.yml



The screenshot shows an IDE with a file explorer on the right and a code editor on the left. The file explorer shows a directory structure with 'hw4' and 'prev\_diagrams' folders. The 'task\_by\_readme' folder is selected. The code editor shows the following docker-compose.yml file:

```
1 services:
2   postgres:
3     image: postgres:latest
4     container_name: postgres_db
5     environment:
6       POSTGRES_USER: student
7       POSTGRES_PASSWORD: student
8       POSTGRES_DB: mydb
9     ports:
10      - "5432:5432"
```

Запускаем контейнер:

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker-compose up -d
time="2024-12-05T21:22:45+03:00" level=warning msg="Found orphan containers ([postgres_db1 postgres_db2]) for this project. If you removed
or renamed this service in your compose file, you can run this command with the --remove-orphans flag to clean it up."
[+] Running 3/3
  █ Network task_by_readme_default      Created                                0.0s
  █ Container task_by_readme-postgres-1 Recreated                             0.1s
  █ Container postgres_db               Started                               0.3s
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>_
```

Создаю в DataGrip новое подключение с типом PostgreSQL:

С датагрипом получились проблемы, он просто не хочет подключаться. Поэтому подключился через psql

```
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>docker-compose up -d
[+] Running 2/2
  █ Network task_by_readme_default      Created
  █ Container postgres_db              Started

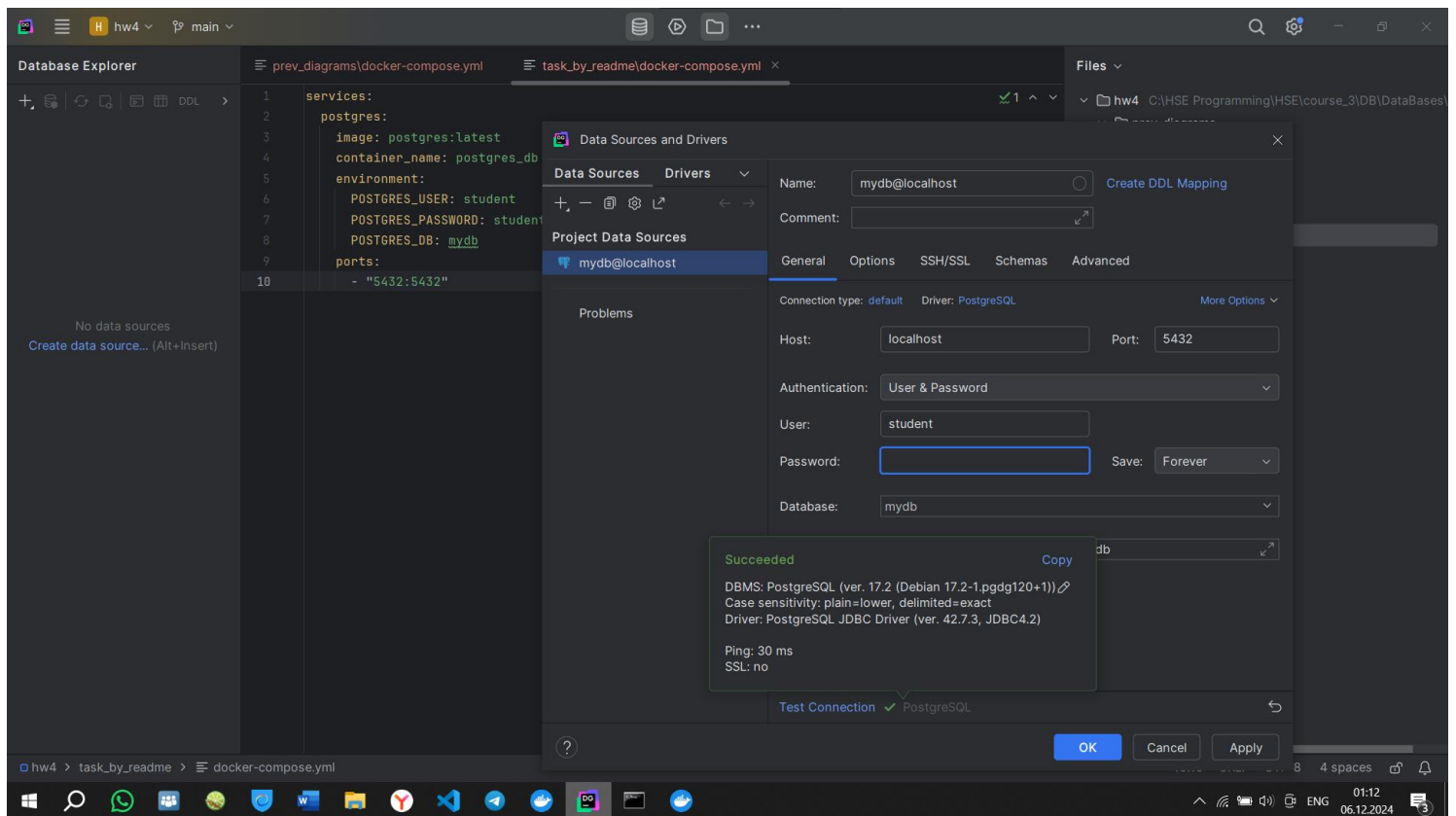
C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>psql -h localhost -U student -d mydb
Password for user student:
psql (17.2)
Type "help" for help.

mydb=# exit

C:\HSE Programming\HSE\course_3\DB\DataBases\hw4\task_by_readme>_
```



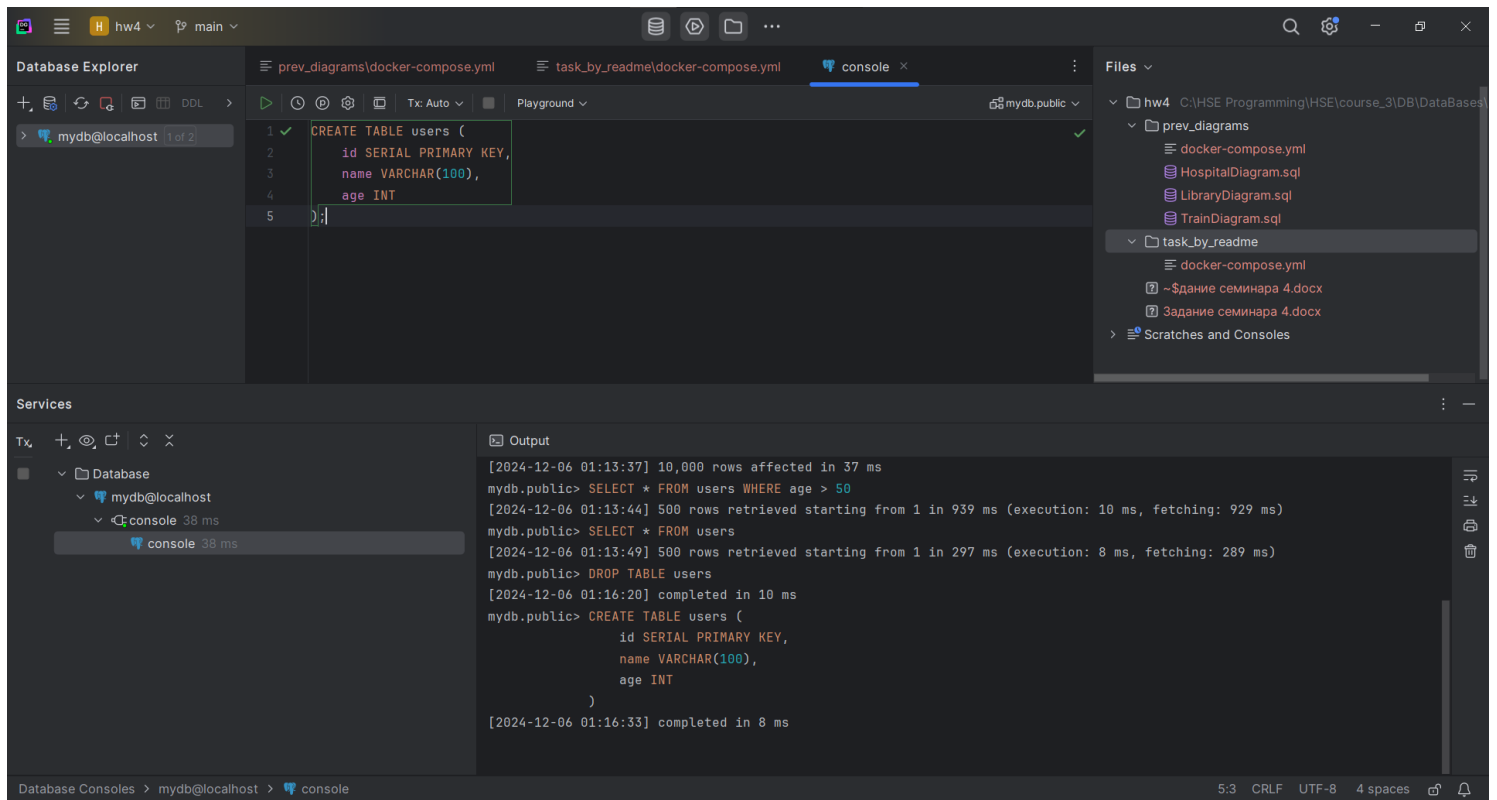




## 6. Тестовые SQL-запросы

### 6.1 Тестовые SQL-запросы:

#### Создаем табличку с пользователями



Сгенерируем 10000 записей:

Database Explorer

mydb@localhost 1 of 2

prev\_diagrams\docker-compose.yml

task\_by\_readme\docker-compose.yml

console x

1

2

3

4

5

INSERT INTO users (name, age)

SELECT

name md5(random()::text),

age floor(random() \* 100)

FROM generate\_series(1, 10000);

Files

hw4 C:\HSE Programming\HSE\course\_3\DB\DataBases

prev\_diagrams

docker-compose.yml

HospitalDiagram.sql

LibraryDiagram.sql

TrainDiagram.sql

task\_by\_readme

docker-compose.yml

~\$дание семинара 4.docx

Задание семинара 4.docx

Scratches and Consoles

Services

Database

mydb@localhost

console 71 ms

Output

[2024-12-06 01:16:20] completed in 10 ms

mydb.public> CREATE TABLE users (

id SERIAL PRIMARY KEY,

name VARCHAR(100),

age INT

)

[2024-12-06 01:16:33] completed in 8 ms

mydb.public> INSERT INTO users (name, age)

SELECT

md5(random()::text),

floor(random() \* 100)

FROM generate\_series(1, 10000)

[2024-12-06 01:20:21] 10,000 rows affected in 45 ms

Database Consoles > mydb@localhost > console

5:32 CRLF UTF-8 4 spaces

01:20 06.12.2024

Выберем всех пользователей старше 50 лет:

Database Explorer

mydb@localhost 1 of 2

prev\_diagrams\docker-compose.yml

task\_by\_readme\docker-compose.yml

console x

1

SELECT \* FROM users WHERE age > 50;

Files

hw4 C:\HSE Programming\HSE\course\_3\DB\DataBases

prev\_diagrams

docker-compose.yml

HospitalDiagram.sql

LibraryDiagram.sql

TrainDiagram.sql

task\_by\_readme

docker-compose.yml

~\$дание семинара 4.docx

Задание семинара 4.docx

Scratches and Consoles

Services

Database

mydb@localhost

console 231 ms

Output mydb.public.users x

id name age

1 3 3e0e5ac820b96987842f350991f4a57d 70

2 4 b066e0e8b00e3619e86ca435f48cc675 82

3 6 fb2fbdaf3adcd4542e0009058bb09b55 62

4 8 425fb5e18f7733c3ae11897693f1db47 79

5 13 c80a815f4d377236261f4c44c6f49d70 56

6 16 72005370db9552eabb8e6f106f194789 51

7 17 163c73b04e74a8ef0c6bebc026ecfec5 53

8 28 76f717bdc4afd7cbb0c8a9317358cf0e 95

9 29 10cfc954707de386d3f3af038376t 73

10 30 49ac163b43ebf780c193dad595b46438 73

Database Consoles > mydb@localhost > console

1:36 CRLF UTF-8 4 spaces

01:21 06.12.2024

## Получаем данные:

The screenshot shows the DataGrip interface with a SQL query executed in the console:

```
1 SELECT * FROM users;
```

The result is displayed in a table with columns: id, name, and age. The table contains 10 rows of data.

id	name	age
1	7586a8f71910d74585aeea9c46d69fa9	14
2	f9cf94bb49659bda7d7e3c85f9ff1ba7	46
3	3e0e5ac820b96987842f350991f4a57d	70
4	b066e0e8b00e3619e86ca435f48cc675	82
5	c427d966c9a5ccbd8e830e5ea09dd86e	20
6	fb2fbdaf3adcd4542e009058bb09b55	62
7	828ea438e7f013afddcb06db970817e5	35
8	425fb5e18f7733c3ae11897693f1db47	79
9	4deba557b8b3349f4d1ac5e177ce5	
10	da59a37da658d9dc03d2ccca7baf52r2	32

## 7. Самостоятельное выполнение

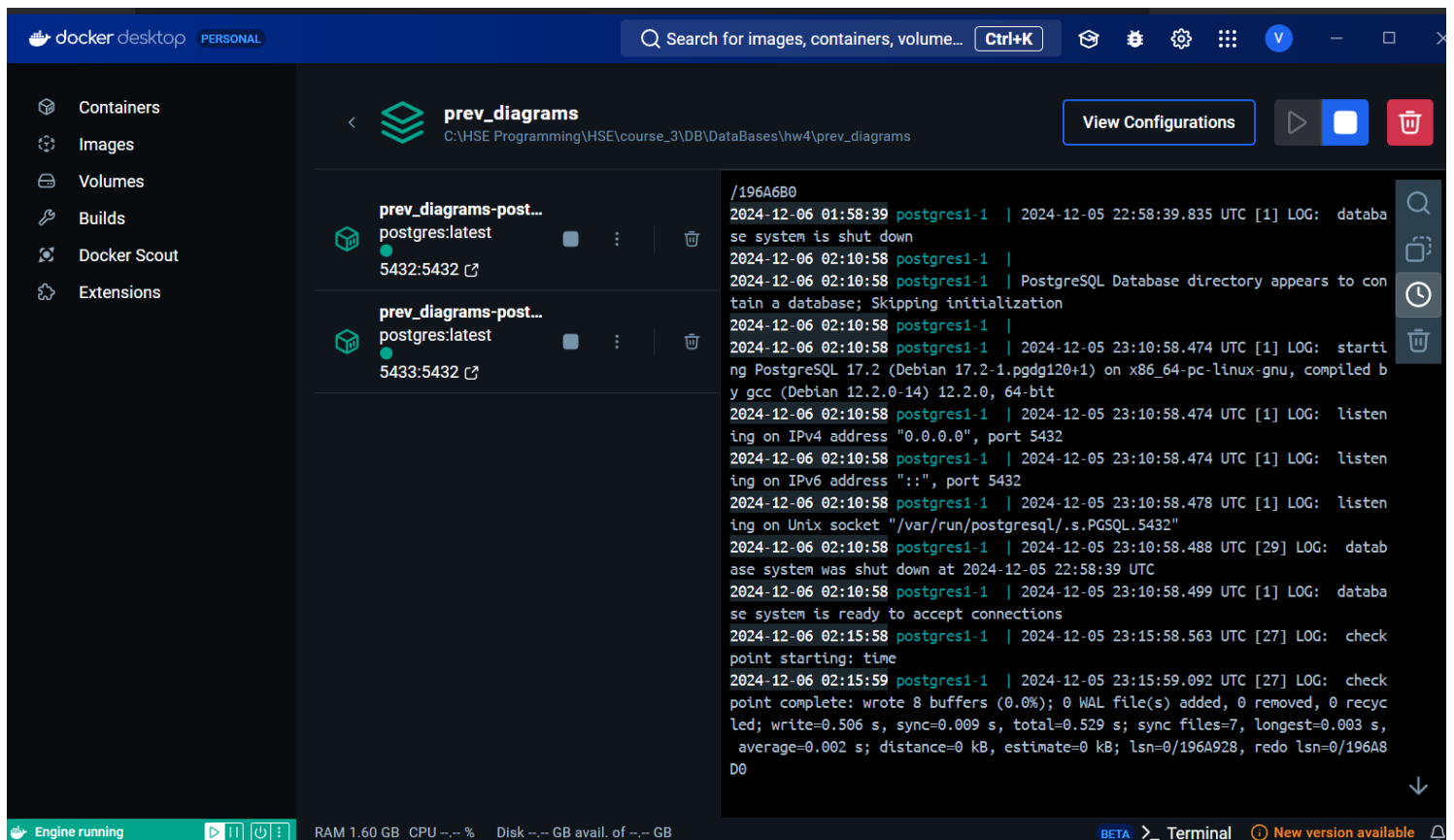
### Создал docker-compose.yml с двумя сервисами: PostgreSQL

The screenshot shows the DataGrip interface with the `docker-compose.yml` file open. The file contains the following configuration:

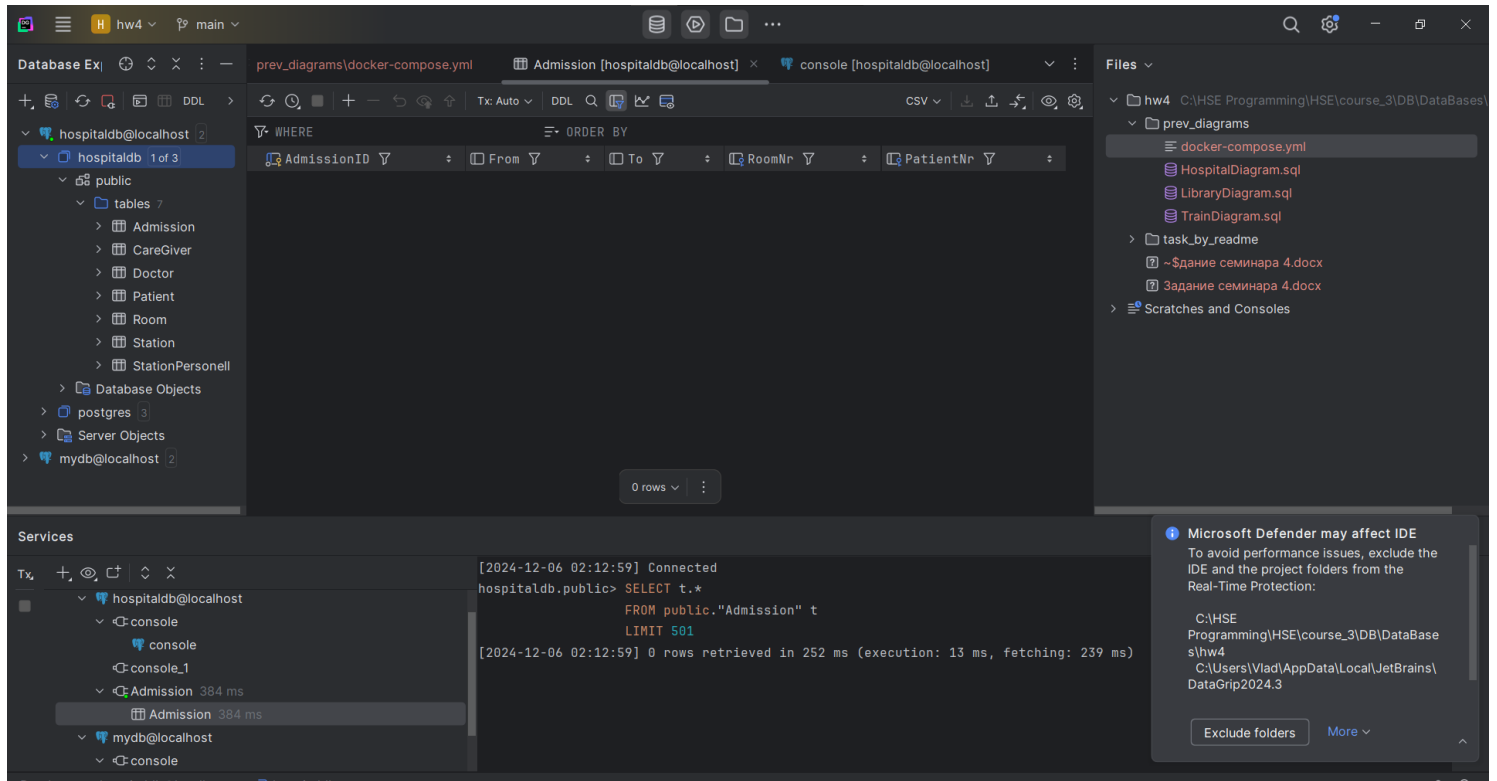
```
1 version: '3.8'
2
3 services:
4   postgres:
5     image: postgres:latest
6     environment:
7       POSTGRES_DB: mydatabase
8       POSTGRES_USER: user
9       POSTGRES_PASSWORD: password
10    volumes:
11      - pgdata:/var/lib/postgresql/data
12    ports:
13      - "5432:5432"
14
15    adminer:
16      image: adminer
17      ports:
18        - "8080:8080"
19
20 volumes:
21   pgdata:
```

The terminal output shows the command `docker-compose up` being executed, and the output indicates that the services are running successfully.

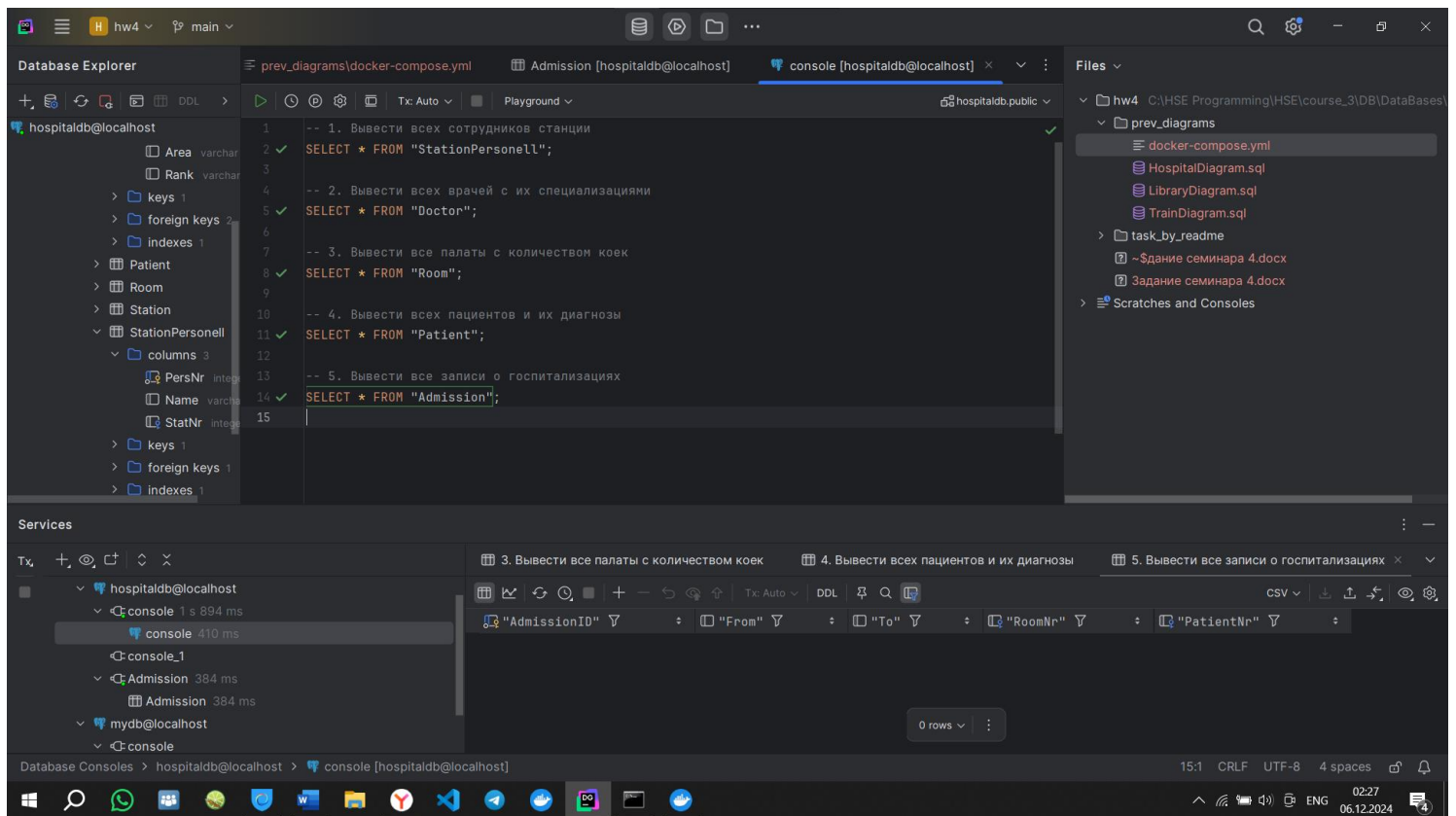
## Подключение в DataGrip



## Запустил диаграммы прошлого задания (видно, что таблицы создались)



## SQL-запросы



## Остановил и удалил контейнеры

