Лабораторная работа №2. Работа с Docker.

Дриневский Кирилл гр.253502. Репозиторий: https://github.com/Drinevskiy/IGI-STRWEB.git

2. Изучите простейшие консольные команды и возможности Docker Desktop (см. лекцию), создать собственный контейнер docker/getting-started, открыть в браузере и изучить tutorial

```
D:\Study\4 semestr\IGI\253502_Drinevskiy_8>docker run -d -p 80:80 docker/getting-started
Unable to find image 'docker/getting-started:latest' locally
latest: Pulling from docker/getting-started
c158987b0551: Pull complete
1e35f6679fab: Pull complete
cb9626c74200: Pull complete
b6334b6ace34: Pull complete
f1d1c9928c82: Pull complete
9b6f639ec6ea: Pull complete
ee68d3549ec8: Pull complete
33e0cbbb4673: Pull complete
4f7e34c2de10: Pull complete
Digest: sha256:d79336f4812b6547a53e735480dde67f8f8f7071b414fbd9297609ffb989abc1
Status: Downloaded newer image for docker/getting-started:latest
66b0de2e4a0c8392639517e3ac0a7885ec67745a0f73cede11f8f4d8e857391c

D:\Study\4 semestr\IGI\253502_Drinevskiy_8>docker ps
CONTAINER ID   IMAGE                  COMMAND                  CREATED          STATUS          PORTS                NAMES
66b0de2e4a0c   docker/getting-started   "/docker-entrypoint.…"   43 seconds ago   Up 41 seconds   0.0.0.0:80->80/tcp   youthful_chatterjee

D:\Study\4 semestr\IGI\253502_Drinevskiy_8>docker rename youthful_chatterjee my-container

D:\Study\4 semestr\IGI\253502_Drinevskiy_8>docker ps
CONTAINER ID   IMAGE                  COMMAND                  CREATED         STATUS         PORTS                NAMES
66b0de2e4a0c   docker/getting-started   "/docker-entrypoint.…"   3 minutes ago   Up 3 minutes   0.0.0.0:80->80/tcp   my-container
```

3. Создайте docker image, который запускает скрипт с использованием функций из https://github.com/smartiqaorg/geometric_lib

Dockerfile U

```
FROM python:3.9

WORKDIR /app
COPY . /app

CMD ["python", "script.py"]
```

script.py U

```
from square import area

a = 5
size = area(a)
print(f"a = {a}, area = {size}")
```

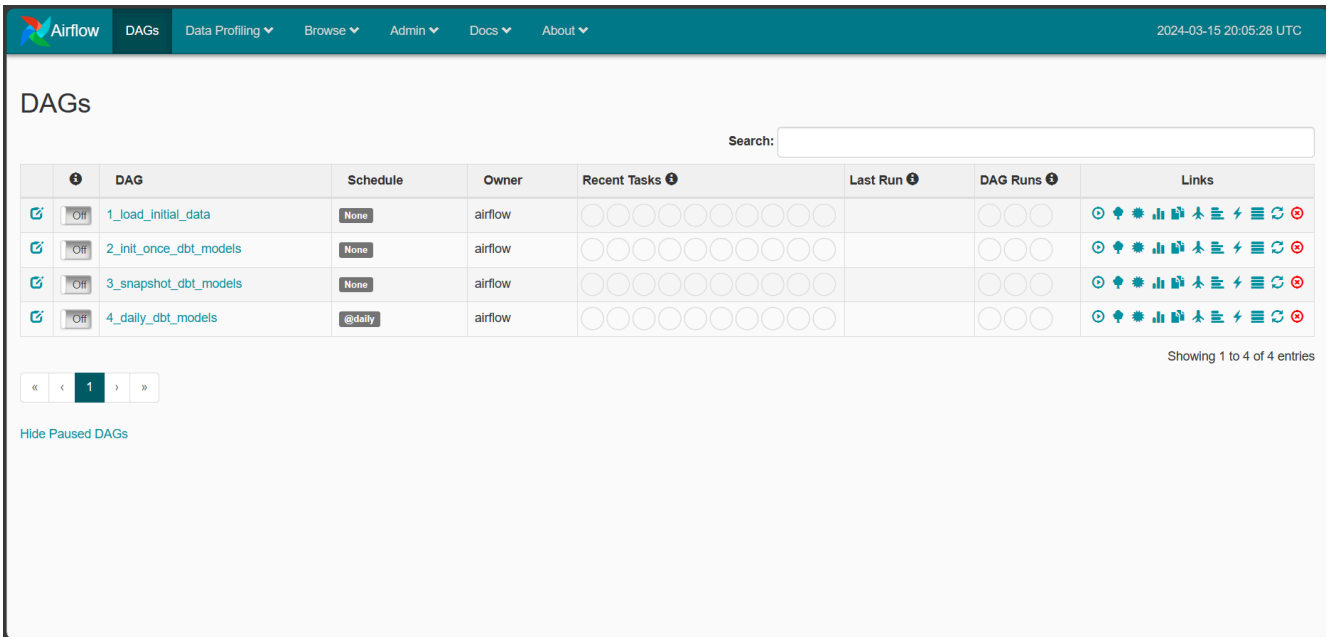
```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\geometric_lib> docker build -t geom-script:v01 .
[+] Building 83.6s (10/10) FINISHED                                                                                  docker:default
 => [internal] load build definition from Dockerfile                                                                          0.1s
 => => transferring dockerfile: 114B                                                                                          0.0s
 => [internal] load metadata for docker.io/library/python:3.9                                                                 4.1s
 => [auth] library/python:pull token for registry-1.docker.io                                                                 0.0s
 => [internal] load .dockerignore                                                                                             0.1s
 => => transferring context: 2B                                                                                               0.0s
 => [1/4] FROM docker.io/library/python:3.9@sha256:e730f8ac1ff165f22c88b5fc9d3e53668ee3e80ea1aefe06c7f06f69da14e83d          77.1s
 => => resolve docker.io/library/python:3.9@sha256:e730f8ac1ff165f22c88b5fc9d3e53668ee3e80ea1aefe06c7f06f69da14e83d           0.0s
 => => sha256:5f899db30843f8330d5a40d1acb26bb00e93a9f21bff253f31c20562fa264767 64.14MB / 64.14MB                             32.2s
 => => sha256:e730f8ac1ff165f22c88b5fc9d3e53668ee3e80ea1aefe06c7f06f69da14e83d 1.86kB / 1.86kB                               0.0s
 => => sha256:0c9a8ddadff127b5ac8a33474054612d3ad43e9e3d58ecd79795bd9bb60901aa 2.01kB / 2.01kB                               0.0s
 => => sha256:4b15bb9670773cea29b810318a606019ec9c136e7bd488ea9ac3b874fbbedb0f 7.33kB / 7.33kB                               0.0s
 => => sha256:71215d55680cf0ab2dcc0e1dd65ed76414e3fb0c294249b5b9319a8fa7c398e4 49.55MB / 49.55MB                             25.2s
 => => sha256:3cb8f9c23302e175d87a827f0a1c376bd59b1f6949bd3bc24ab8da0d669cdfa0 24.05MB / 24.05MB                             10.9s
 => => sha256:567db630df8d441ffe43e050ede26996c87e3b33c99f79d4fba0bf6b7ffa0213 211.14MB / 211.14MB                           62.3s
 => => sha256:d68cd2123173935e339e3feb56980a0aefd7364ad43ca2b9750699e60fbf74c6 6.39MB / 6.39MB                               28.8s
 => => extracting sha256:71215d55680cf0ab2dcc0e1dd65ed76414e3fb0c294249b5b9319a8fa7c398e4                                     3.9s
 => => sha256:976ac31b524c1810ec4aae762302767f782484bd1eb251e61205e863c596821c 15.82MB / 15.82MB                             35.8s
 => => extracting sha256:3cb8f9c23302e175d87a827f0a1c376bd59b1f6949bd3bc24ab8da0d669cdfa0                                     1.1s
 => => sha256:c619eab02dc482c23a675f265e0ceb5973504d8de7a119f155e4255d216d5566 244B / 244B                                   32.4s
 => => extracting sha256:5f899db30843f8330d5a40d1acb26bb00e93a9f21bff253f31c20562fa264767                                     4.6s
 => => sha256:d136c3310133608033a988e1c4e7787584463ba791852ccc94ccdcb94a6c5f44 2.85MB / 2.85MB                               34.0s
 => => extracting sha256:567db630df8d441ffe43e050ede26996c87e3b33c99f79d4fba0bf6b7ffa0213                                    10.6s
 => => extracting sha256:d68cd2123173935e339e3feb56980a0aefd7364ad43ca2b9750699e60fbf74c6                                     0.5s
 => => extracting sha256:976ac31b524c1810ec4aae762302767f782484bd1eb251e61205e863c596821c                                     0.8s
 => => extracting sha256:c619eab02dc482c23a675f265e0ceb5973504d8de7a119f155e4255d216d5566                                     0.0s
 => => extracting sha256:d136c3310133608033a988e1c4e7787584463ba791852ccc94ccdcb94a6c5f44                                     0.5s
 => [internal] load build context                                                                                             0.1s
 => => transferring context: 731B                                                                                             0.0s
 => [2/4] WORKDIR /app                                                                                                        1.0s
 => [3/4] COPY . /app                                                                                                         0.1s
 => [4/4] RUN ["python", "script.py"]                                                                                         0.6s
 => exporting to image                                                                                                        0.1s
 => => exporting layers                                                                                                       0.1s
 => => writing image sha256:95214156e0357704c4224afbfba9da690ff331f531d41ceae9a137b6272a1083                                  0.0s
 => => naming to docker.io/library/geom-script:v01                                                                            0.0s
```

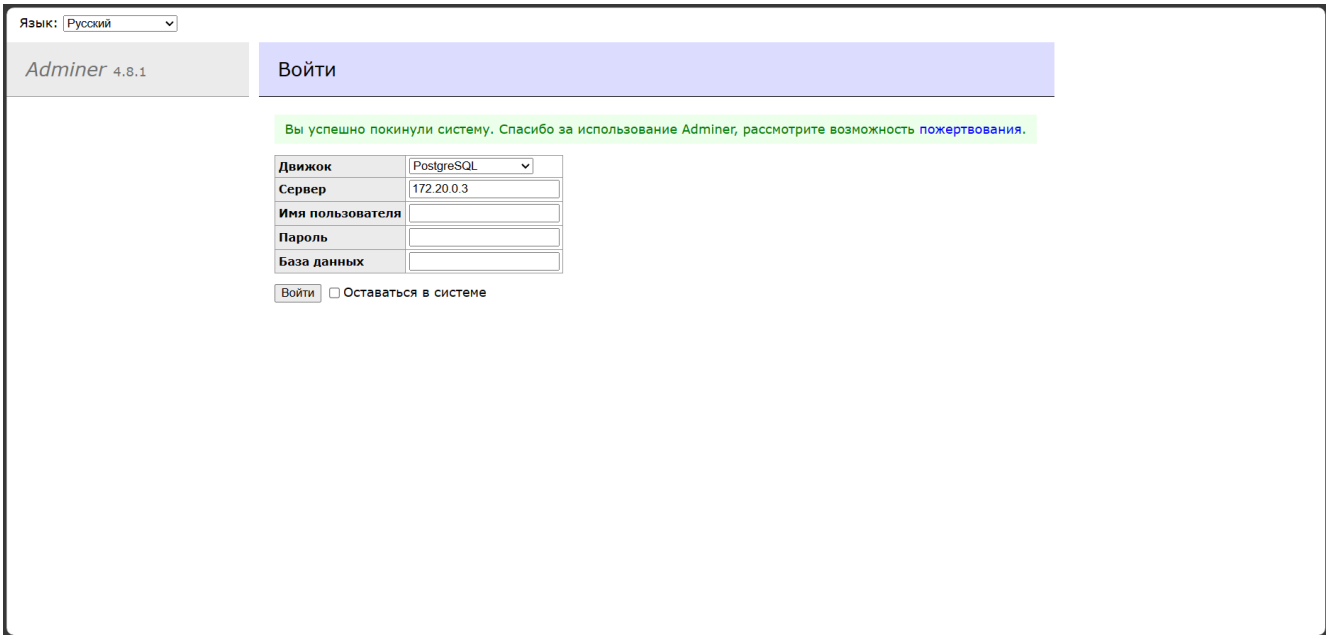
```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\geometric_lib> docker run --name geometry geom-script
a = 5, area = 25
```

4. Скачать любой доступный проект с GitHub с произвольным стеком технологий (пример – см. индивидуальное задание) или использовать свой, ранее разработанный. Создать для него необходимый контейнер, используя Docker Compose для управления многоконтейнерными приложениями. Запустить проект в контейнере.

Проект: https://github.com/konosp/dbt-airflow-docker-compose.git

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker compose up --build
2024/03/15 22:34:16 http2: server: error reading preface from client //./pipe/docker_engine: file has already been closed
[+] Building 0.0s (0/0)  docker:default
[+] Building 196.0s (11/11) FINISHED                                                                                docker:default
 => [airflow internal] load build definition from dockerfile                                                                 0.0s
 => => transferring dockerfile: 442B                                                                                         0.0s
 => [airflow internal] load metadata for docker.io/library/python:3.7                                                        1.8s
 => [airflow auth] library/python:pull token for registry-1.docker.io                                                        0.0s
 => [airflow internal] load .dockerignore                                                                                    0.0s
 => => transferring context: 50B                                                                                             0.0s
 => CACHED [airflow 1/5] FROM docker.io/library/python:3.7@sha256:eedf63967cdb57d8214db38ce21f105003ed4e4d0358f02bedc057341bcf92a0  0.0s
 => [airflow internal] load build context                                                                                    0.0s
 => => transferring context: 80B                                                                                             0.0s
 => [airflow 2/5] RUN pip install wtforms==2.3.3 &&     pip install 'apache-airflow[postgres]==1.10.14' &&     pip install dbt==0.15 &&     pip install SQLA  189.2s
 => [airflow 3/5] RUN mkdir /project                                                                                         0.3s
 => [airflow 4/5] COPY scripts_airflow/ /project/scripts/                                                                    0.1s
 => [airflow 5/5] RUN chmod +x /project/scripts/init.sh                                                                      0.4s
 => [airflow] exporting to image                                                                                             3.9s
 => => exporting layers                                                                                                      3.9s
 => => writing image sha256:47441bde39d91db1c029f61ddc58c38f840b4d4c6d162644d87e245b53ee41fd                                 0.0s
 => => naming to docker.io/library/dbt-airflow-docker-compose-airflow                                                        0.0s
[+] Running 5/5
 ✓ Network dbt-airflow-docker-compose_default                Created                                                         0.1s
 ✓ Container dbt-airflow-docker-compose-postgres-dbt-1       Created                                                         0.1s
 ✓ Container dbt-airflow-docker-compose-postgres-airflow-1   Created                                                         0.1s
 ✓ Container dbt-airflow-docker-compose-adminer-1            Created                                                         0.1s
 ✓ Container dbt-airflow-docker-compose-airflow-1            Created                                                         0.1s
```





5. Настроить сети и тома для обеспечения связи между контейнерами и сохранения данных (исходные данные, логин, пароль и т.д.)

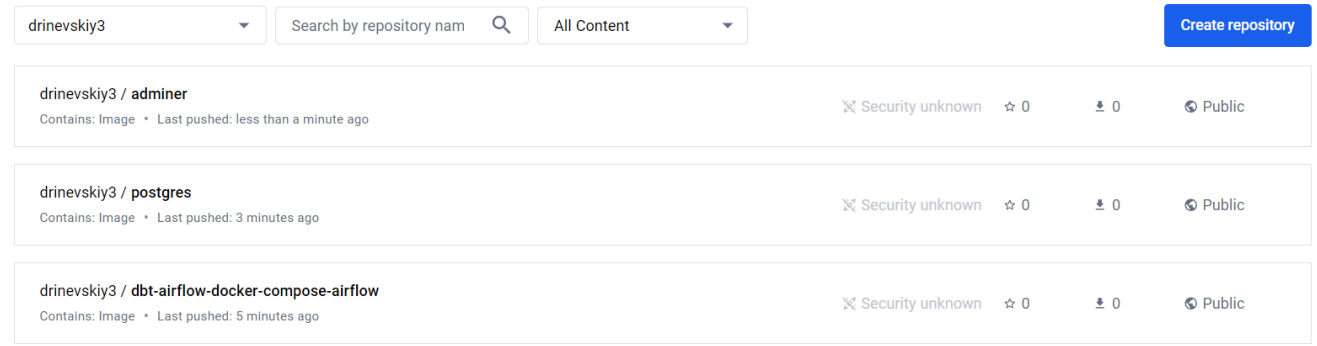
docker-compose.yml

```yaml
version: '3'
services:
  postgres-airflow:
    image: postgres
    environment:
      POSTGRES_PASSWORD: 1234
      POSTGRES_USER : Kirill
      POSTGRES_DB : airflowdb

      AIRFLOW_SCHEMA: airflow
    expose:
      - 5432
    restart: always
    volumes:
      - ./scripts_postgres:/docker-entrypoint-initdb.d
      # - ./sample_data:/sample_data
    networks:
      - myNet

  postgres-dbt:
    image: postgres
    environment:
      POSTGRES_PASSWORD: 1234
      POSTGRES_USER : Kirill
      POSTGRES_DB : dbtdb
      DBT_SCHEMA: dbt
      DBT_RAW_DATA_SCHEMA: dbt_raw_data
    expose:
      - 5432
    restart: always
    volumes:
      - ./sample_data:/sample_data
    networks:
      - myNet

  airflow:
    build: .
    restart: always
    environment:
      DBT_PROFILES_DIR: /dbt
      AIRFLOW_HOME: /airflow
      AIRFLOW__CORE__DAGS_FOLDER: /airflow/dags
      AIRFLOW__CORE__PARALLELISM: 4
      AIRFLOW__CORE__DAG_CONCURRENCY: 4
      AIRFLOW__CORE__MAX_ACTIVE_RUNS_PER_DAG: 4
      # AIRFLOW__ADMIN__HIDE_SENSITIVE_VARIAB
      # Postgres details need to match with t
      POSTGRES_USER: Kirill
      POSTGRES_PASSWORD: 1234
      POSTGRES_HOST: postgres-airflow
      POSTGRES_PORT: 5432
      POSTGRES_DB: airflowdb
      # postgres-dbt connection details. Requ
      # Credentials need to match with servic
      DBT_POSTGRES_PASSWORD: 1234
      DBT_POSTGRES_USER : Kirill
      DBT_POSTGRES_DB : dbtdb
      DBT_DBT_SCHEMA: dbt
      DBT_DBT_RAW_DATA_SCHEMA: dbt_raw_data
      DBT_POSTGRES_HOST: postgres-dbt
    depends_on:
      - postgres-airflow
      - postgres-dbt
    ports:
      - 8000:8080
    volumes:
      - ./dbt:/dbt
      - ./airflow:/airflow
    networks:
      - myNet

  adminer:
    image: adminer
    restart: always
    ports:
      - 8080:8080
    depends_on:
      - postgres-airflow
      - postgres-dbt
    networks:
      - myNet

networks:
  myNet:
```

6. Разместите результат в созданный репозиторий в DockerHub

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker tag 47441bde39d91db1c029f61ddc58c38f840b4d4c6d162644d87e245b53ee41fd drinevs
kiy3/dbt-airflow-docker-compose-airflow:latest
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker push drinevskiy3/dbt-airflow-docker-compose-airflow:latest
The push refers to repository [docker.io/drinevskiy3/dbt-airflow-docker-compose-airflow]
03912eb3c12a: Pushed
60e5c411f416: Pushed
abebaac0fae6: Pushed
9832cbb5514c: Pushed
45c430b35dba: Mounted from library/python
8e23f007f16f: Mounted from library/python
aef22e07d5d7: Mounted from library/python
c26432533a6a: Mounted from library/python
01d6cdeac539: Mounted from library/python
a981dddd4c65: Mounted from library/python
f6589095d5b5: Mounted from library/python
7c85cfa30cb1: Mounted from library/python
latest: digest: sha256:aaaf7152c2768bba4a621c014183c4a4c67cf41bb2554076392adfc99789ce23 size: 2841
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker tag b9390dd1ea18e34fa4bf7b43c99faac1455f712a9095ffc2c4071994bb7df148 drinevs
kiy3/postgres:latest
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker push drinevskiy3/postgres:latest
The push refers to repository [docker.io/drinevskiy3/postgres]
1a5db5fc09d1: Mounted from library/postgres
44ef72c67da4: Mounted from library/postgres
a03ae2f45899: Mounted from library/postgres
acf89ed73193: Mounted from library/postgres
8b989697200d: Mounted from library/postgres
17c7143ec5ac: Mounted from library/postgres
f4658e0538c1: Mounted from library/postgres
f0fd3e52b8f5: Mounted from library/postgres
5e92f76fe407: Mounted from library/postgres
7a1a926b41ec: Mounted from library/postgres
d0c5b1b578f0: Mounted from library/postgres
6e73bb47a647: Mounted from library/postgres
96160384c805: Mounted from library/postgres
a483da8ab3e9: Mounted from library/postgres
latest: digest: sha256:70fabd496921b9c502e5b18e09bdb545ca3b2ca1c1b851191f3b8ebb2d84607a size: 3247
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker tag 2b6c8f50b2b578f3a0d231773bd9cf0e69fd900a77e2cabaebb3ca46d15186c1 drinevskiy3/adminer:latest
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker push drinevskiy3/adminer:latest
The push refers to repository [docker.io/drinevskiy3/adminer]
59c02ac341d1: Mounted from library/adminer
6a9edcbefb8c: Mounted from library/adminer
d226e5708eef: Mounted from library/adminer
3540d531d34b: Mounted from library/adminer
ffec6956cee6: Mounted from library/adminer
77cd307a5e81: Mounted from library/adminer
ac2949c69757: Mounted from library/adminer
latest: digest: sha256:da6d81063aaaaab118c523344420faab9ae3aa2a775755ad7e66362490c8a01f size: 1782
```



7. а. Получить информацию о всех сетях, работающих на текущем хосте и подробности о каждом типе сети

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network ls
NETWORK ID     NAME                                DRIVER    SCOPE
df7b572365f6   bridge                              bridge    local
55ac4d00e39e   dbt-airflow-docker-compose_myNet    bridge    local
bd828b989ec0   host                                host      local
8f034083121d   none                                null      local
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect bridge
[
    {
        "Name": "bridge",
        "Id": "df7b572365f62e856b53eb5f8f884461243cfd1570c13e4bf02e6240e501c8a8",
        "Created": "2024-03-16T10:23:40.665637864Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.17.0.0/16",
                    "Gateway": "172.17.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {
            "com.docker.network.bridge.default_bridge": "true",
            "com.docker.network.bridge.enable_icc": "true",
            "com.docker.network.bridge.enable_ip_masquerade": "true",
            "com.docker.network.bridge.host_binding_ipv4": "0.0.0.0",
            "com.docker.network.bridge.name": "docker0",
            "com.docker.network.driver.mtu": "1500"
        },
        "Labels": {}
    }
]
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect host
[
    {
        "Name": "host",
        "Id": "bd828b989ec097b2f1292aadf570ba733310482d2e6d7fb579d5f347ea59f633",
        "Created": "2024-03-11T16:36:56.312959956Z",
        "Scope": "local",
        "Driver": "host",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": null
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {},
        "Labels": {}
    }
]
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect none
[
    {
        "Name": "none",
        "Id": "8f034083121d7738670269411dd74df283f5be7511997efe9ce8df0bc21bebce",
        "Created": "2024-03-11T16:36:56.2920608Z",
        "Scope": "local",
        "Driver": "null",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": null
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {},
        "Labels": {}
    }
]
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect dbt-airflow-docker-compose_myNet
[
    {
        "Name": "dbt-airflow-docker-compose_myNet",
        "Id": "55ac4d00e39e245b63b06718231f63e8cd7c71c439bb90f32a1b2e340165f73e",
        "Created": "2024-03-16T12:14:42.441240049Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "172.18.0.0/16",
                    "Gateway": "172.18.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "985b523b0d8afbc0fba25492a8a096dff28e44c1c25ef73c7c0b0ac5a3b4a5b2": {
                "Name": "dbt-airflow-docker-compose-postgres-airflow-1",
                "EndpointID": "8977768ed21d69f92afde083d170a9c34e84886c0f6b286eb29a8ec7c24a4a2e",
                "MacAddress": "02:42:ac:12:00:03",
                "IPv4Address": "172.18.0.3/16",
                "IPv6Address": ""
            },
            "c4ce82dc871040ca473a975015bea04d8870a3bb2b1c25399c1bad2a4e4e7705": {
                "Name": "dbt-airflow-docker-compose-adminer-1",
                "EndpointID": "2b8e374500d9b48e7dfe5424b22bdb746dd903ea06a4b490361f4b44ca02762c",
                "MacAddress": "02:42:ac:12:00:05",
                "IPv4Address": "172.18.0.5/16",
                "IPv6Address": ""
            },
            "dacad64f99bdb9a4aeb72e06521f0d6ee7c8722ec81bfcdc5ee369639c47044a": {
                "Name": "dbt-airflow-docker-compose-airflow-1",
                "EndpointID": "594abaea3869f57af98c2bf2bf0d57fbb3907c82c623959a580dd16186997889",
                "MacAddress": "02:42:ac:12:00:04",
                "IPv4Address": "172.18.0.4/16",
                "IPv6Address": ""
            },
            "f5c98420ca57d87d660e88d3b572ed4ef472a755ea32397a6dc4346373527836": {
                "Name": "dbt-airflow-docker-compose-postgres-dbt-1",
                "EndpointID": "deebbc8ebb82355c7b0c3194647d65e8ad309f72735fbab504011f11aec4f300",
                "MacAddress": "02:42:ac:12:00:02",
                "IPv4Address": "172.18.0.2/16",
                "IPv6Address": ""
            }
        },
        "Options": {},
        "Labels": {
            "com.docker.compose.network": "myNet",
            "com.docker.compose.project": "dbt-airflow-docker-compose",
            "com.docker.compose.version": "2.24.6"
        }
    }
]
```

б. Создать свою собственную сеть bridge, проверить, создана ли она, запустить Docker-контейнер в созданной сети, вывести о ней всю информацию(включая IP-адрес контейнера), отключить сеть от контейнера

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network create -d bridge my-bridge
3bd0663a23050c52a4a269fbb4f689e46e019eac31a85002c3c3f426cdb49b23
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network ls
NETWORK ID     NAME                                DRIVER    SCOPE
df7b572365f6   bridge                              bridge    local
f86a68ef0d61   dbt-airflow-docker-compose_myNet    bridge    local
bd828b989ec0   host                                host      local
3bd0663a2305   my-bridge                           bridge    local
8f034083121d   none                                null      local
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker run --network=my-bridge --name=cont -p 80:80 docker/getting-started
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect my-bridge
[
    {
        "Name": "my-bridge",
        "Id": "3bd0663a23050c52a4a269fbb4f689e46e019eac31a85002c3c3f426cdb49b23",
        "Created": "2024-03-16T14:17:54.96873695Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.20.0.0/16",
                    "Gateway": "172.20.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "73e9dfb28df232c1c57d44cea906c6e9820a62a16cd21ebb30c6fbcfcedcae6e": {
                "Name": "cont",
                "EndpointID": "da63c2c57b5276c0cc20cb4dbd398edd644548d240c1b41017f504a9481405e0",
                "MacAddress": "02:42:ac:14:00:02",
                "IPv4Address": "172.20.0.2/16",
                "IPv6Address": ""
            }
        },
        "Options": {},
        "Labels": {}
    }
]
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network disconnect my-bridge cont
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect my-bridge
[
    {
        "Name": "my-bridge",
        "Id": "3bd0663a23050c52a4a269fbb4f689e46e019eac31a85002c3c3f426cdb49b23",
        "Created": "2024-03-16T14:17:54.96873695Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.20.0.0/16",
                    "Gateway": "172.20.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {},
        "Options": {},
        "Labels": {}
    }
]
```

в. Создать еще одну сеть bridge, вывести о ней всю информацию, запустить в ней три контейнера, подключиться к любому из контейнеров и пропинговать два других из оболочки контейнера, убедиться, что между контейнерами происходит общение по IP-адресу

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network create my-bridge2
ce16c196e46b169d966c566be5173868084504bcec4a0d6fa0f4211468e21cae
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network ls
NETWORK ID     NAME         DRIVER    SCOPE
df7b572365f6   bridge       bridge    local
bd828b989ec0   host         host      local
3bd0663a2305   my-bridge    bridge    local
ce16c196e46b   my-bridge2   bridge    local
8f034083121d   none         null      local
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker run --name=cont2 --network=my-bridge2 docker/getting-started
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker run -it -d --name=cont --network=my-bridge2 alpine ash
Unable to find image 'alpine:latest' locally
latest: Pulling from library/alpine
4abcf2066143: Pull complete
Digest: sha256:c5b1261d6d3e43071626931fc004f70149baeba2c8ec672bd4f27761f8e1ad6b
Status: Downloaded newer image for alpine:latest
0b381d17cc09161751c6f8a0a04c3e5a8dcb55971b3ad537181697915b30ce8d
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker run -it -d --name=cont2 --network=my-bridge2 alpine ash
51033baca4362d5083debbddda9305fc25fc64a0918a2e3fd639f2f28dc30620
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker run -it -d --name=cont3 --network=my-bridge2 alpine ash
51f9e04bf1f3b8de915d1b37da10888b1f631881499f46c30cf8a567d9972fec
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect my-bridge2
[
    {
        "Name": "my-bridge2",
        "Id": "ce16c196e46b169d966c566be5173868084504bcec4a0d6fa0f4211468e21cae",
        "Created": "2024-03-16T14:41:18.1455401Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.21.0.0/16",
                    "Gateway": "172.21.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "0b381d17cc09161751c6f8a0a04c3e5a8dcb55971b3ad537181697915b30ce8d": {
                "Name": "cont",
                "EndpointID": "789eff3efa6baeaadfca38549a52a4ded244003e1276d57af1ab5209fcfa0ba5",
                "MacAddress": "02:42:ac:15:00:02",
                "IPv4Address": "172.21.0.2/16",
                "IPv6Address": ""
            },
            "51033baca4362d5083debbddda9305fc25fc64a0918a2e3fd639f2f28dc30620": {
                "Name": "cont2",
                "EndpointID": "b74e9818f41d137b853580a6821775359bbac70dac51e6d10215f41cf1d36c02",
                "MacAddress": "02:42:ac:15:00:03",
                "IPv4Address": "172.21.0.3/16",
                "IPv6Address": ""
            },
            "51f9e04bf1f3b8de915d1b37da10888b1f631881499f46c30cf8a567d9972fec": {
                "Name": "cont3",
                "EndpointID": "ccf1a01ccc766fff12c4f9a4b8b62702b55595af403dd8fdb0111efeec133e91",
                "MacAddress": "02:42:ac:15:00:04",
                "IPv4Address": "172.21.0.4/16",
                "IPv6Address": ""
            }
        },
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker container attach cont2
/ # ping -c 3 cont
PING cont (172.21.0.2): 56 data bytes
64 bytes from 172.21.0.2: seq=0 ttl=64 time=0.147 ms
64 bytes from 172.21.0.2: seq=1 ttl=64 time=0.162 ms
64 bytes from 172.21.0.2: seq=2 ttl=64 time=0.110 ms

--- cont ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.110/0.139/0.162 ms
/ # ping -c 3 cont3
PING cont3 (172.21.0.4): 56 data bytes
64 bytes from 172.21.0.4: seq=0 ttl=64 time=0.163 ms
64 bytes from 172.21.0.4: seq=1 ttl=64 time=0.131 ms
64 bytes from 172.21.0.4: seq=2 ttl=64 time=0.104 ms

--- cont3 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 0.104/0.132/0.163 ms
```

г. Создать свою собственную сеть overlay, проверить, создана ли она, вывести о ней всю информацию

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker swarm init
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network ls
NETWORK ID     NAME              DRIVER    SCOPE
df7b572365f6   bridge            bridge    local
45cfc11424a7   docker_gwbridge   bridge    local
bd828b989ec0   host              host      local
tbeaz8dm9bxn   ingress           overlay   swarm
3bd0663a2305   my-bridge         bridge    local
ce16c196e46b   my-bridge2        bridge    local
8f034083121d   none              null      local
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect ingress
[
    {
        "Name": "ingress",
        "Id": "tbeaz8dm9bxnk4g6oo1s5jshe",
        "Created": "2024-03-16T15:10:02.922699924Z",
        "Scope": "swarm",
        "Driver": "overlay",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "10.0.0.0/24",
                    "Gateway": "10.0.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": true,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "ingress-sbox": {
                "Name": "ingress-endpoint",
                "EndpointID": "c3f391da249787670fad96e82ac14552595729d657005e5cb3de1ab039b5d702",
                "MacAddress": "02:42:0a:00:00:02",
                "IPv4Address": "10.0.0.2/24",
                "IPv6Address": ""
            }
        },
        "Options": {
            "com.docker.network.driver.overlay.vxlanid_list": "4096"
        },
        "Labels": {},
        "Peers": [
            {
                "Name": "c561b8a7ffd2",
                "IP": "192.168.65.3"
            }
        ]
    }
]
```

д. Создать еще одну сеть overlay, проверить, создана ли она, вывести о ней всю информацию, удалить сеть

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network create --driver overlay my-overlay
yvhp4kk7wqp51yzmxh6vb23z1
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network ls
NETWORK ID     NAME              DRIVER    SCOPE
df7b572365f6   bridge            bridge    local
45cfc11424a7   docker_gwbridge   bridge    local
bd828b989ec0   host              host      local
tbeaz8dm9bxn   ingress           overlay   swarm
3bd0663a2305   my-bridge         bridge    local
ce16c196e46b   my-bridge2        bridge    local
yvhp4kk7wqp5   my-overlay        overlay   swarm
8f034083121d   none              null      local
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network inspect my-overlay
[
    {
        "Name": "my-overlay",
        "Id": "yvhp4kk7wqp51yzmxh6vb23z1",
        "Created": "2024-03-16T15:17:33.050198857Z",
        "Scope": "swarm",
        "Driver": "overlay",
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": null,
            "Config": [
                {
                    "Subnet": "10.0.2.0/24",
                    "Gateway": "10.0.2.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": null,
        "Options": {
            "com.docker.network.driver.overlay.vxlanid_list": "4098"
        },
        "Labels": null
    }
]
```

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network rm my-overlay
my-overlay
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network ls
NETWORK ID     NAME              DRIVER    SCOPE
df7b572365f6   bridge            bridge    local
45cfc11424a7   docker_gwbridge   bridge    local
bd828b989ec0   host              host      local
tbeaz8dm9bxn   ingress           overlay   swarm
3bd0663a2305   my-bridge         bridge    local
ce16c196e46b   my-bridge2        bridge    local
8f034083121d   none              null      local
```

е. Попробовать создать сеть host, сохранить результат в отчет.

```
PS D:\Study\4 semestr\IGI\253502_Drinevskiy_8\IGI\LR2\dbt-airflow-docker-compose> docker network create --driver host my-host
Error response from daemon: only one instance of "host" network is allowed
```