1. network front_back (front container, back container)

2. network back_database (back container, database container)

```
soha@ubuntu:~$ docker network create front_back
de0a81992c070f7a9ef5b59ea4010340d2213eeb7e095c2d9bca9862c546b485
soha@ubuntu:~$ docker network create back_db
04e8a536e9e74a988f8c130fc988941491a18402a0152faf9160c8f4d536acde
soha@ubuntu:~$ docker network ls
NETWORK ID      NAME          DRIVER       SCOPE
04e8a536e9e7    back_db       bridge       local
2d78319d7d4e    bridge        bridge       local
de0a81992c07    front_back    bridge       local
00f688fedcf1    host          host         local
c4856f4cc45a    none          null         local
```

2. Create a nginx container in the network 1:

```
soha@ubuntu:~$ docker run -d --name nginx_con --network front_back nginx
7a0f816da90afba4ccb6a87b0a5c60fe594745cc23444be928ac5355f0101d5f
soha@ubuntu:~$ docker ps
CONTAINER ID   IMAGE                           COMMAND               CREATED         STATUS          PORTS
                            NAMES
7a0f816da90a   nginx                           "/docker-entrypoint…" 14 seconds ago  Up 13 seconds   80/tcp
                            nginx_con
3033457f4878   sohaash/simple_flask_app:v0.3   "python3 app.py"      3 hours ago     Up 3 hours
                            simple_flask_app
```

3. Create a container form your flask app in network 1, and network 2

```
soha@ubuntu:~$ docker run -d --name flask_app --network front_back sohaash/simple_flask_app:v0.3
5f9920503ed7f933f9b9221a66b0d292f73802411e00294e1dc6a9fac488324b
```

```
soha@ubuntu:~$ docker network connect back_db flask_app
soha@ubuntu:~$ docker ps
CONTAINER ID   IMAGE                           COMMAND               CREATED         STATUS          PORTS
                            NAMES
5f9920503ed7   sohaash/simple_flask_app:v0.3   "python3 app.py"      55 seconds ago  Up 54 seconds   5000/tcp
                            flask_app
7a0f816da90a   nginx                           "/docker-entrypoint…" 3 minutes ago   Up 3 minutes    80/tcp
                            nginx_con
3033457f4878   sohaash/simple_flask_app:v0.3   "python3 app.py"      3 hours ago     Up 3 hours
                            simple_flask_app
```

4. Create a Maria db container in network 2

```
soha@ubuntu:~$ docker run -d --name mariadb_db --network back_db -e MYSQL_ROOT_PASSWORD=my-secret-pw mariadb
4076cce2e67bb5663d8a09dab5638e512644cff97f34f5ef34b0a78dea22494b
```

5. verify with screenshots:

- docker inspect flask_app:

```
"Networks": {
    "back_db": {
        "IPAMConfig": {},
        "Links": null,
        "Aliases": [],
        "MacAddress": "72:73:57:ca:57:b0",
        "DriverOpts": {},
        "GwPriority": 0,
        "NetworkID": "04e8a536e9e74a988f8c130fc988941491a18402a0152faf9160c8f4d536acde",
        "EndpointID": "6c238e024c96178a1723ee414cba0250c8fee007d6ad9bcce127a775e9cbbc23",
        "Gateway": "172.19.0.1",
        "IPAddress": "172.19.0.2",
        "IPPrefixLen": 16,
        "IPv6Gateway": "",
        "GlobalIPv6Address": "",
        "GlobalIPv6PrefixLen": 0,
        "DNSNames": [
            "flask_app",
            "5f9920503ed7"
        ]
    },
    "front_back": {
        "IPAMConfig": null,
        "Links": null,
        "Aliases": null,
        "MacAddress": "f2:10:c6:f4:ee:69",
        "DriverOpts": null,
        "GwPriority": 0,
        "NetworkID": "de0a81992c070f7a9ef5b59ea4010340d2213eeb7e095c2d9bca9862c546b485",
        "EndpointID": "b7750f560cb37d8b80fcf01098ce38ebe2a869646ce719bb618acdb312488e84",
        "Gateway": "172.18.0.1",
        "IPAddress": "172.18.0.3",
        "IPPrefixLen": 16,
        "IPv6Gateway": "",
        "GlobalIPv6Address": "",
        "GlobalIPv6PrefixLen": 0,
        "DNSNames": [
            "flask_app",
```

- docker inspect nginx_con:

```
MacAddress: ,
"Networks": {
    "front_back": {
        "IPAMConfig": null,
        "Links": null,
        "Aliases": null,
        "MacAddress": "92:19:41:64:b6:1d",
        "DriverOpts": null,
        "GwPriority": 0,
        "NetworkID": "de0a81992c070f7a9ef5b59ea4010340d2213eeb7e095c2d9bca9862c546b485",
        "EndpointID": "24970fff9ebe09b8a7c08b2cc385f365b752845efd51984e2adea3a889b9010e",
        "Gateway": "172.18.0.1",
        "IPAddress": "172.18.0.2",
        "IPPrefixLen": 16,
        "IPv6Gateway": "",
        "GlobalIPv6Address": "",
        "GlobalIPv6PrefixLen": 0,
        "DNSNames": [
            "nginx_con",
            "7a0f816da90a"
        ]
```

- docker inspect mariadb_db:

```
        "Networks": {
            "back_db": {
                "IPAMConfig": null,
                "Links": null,
                "Aliases": null,
                "MacAddress": "46:bf:66:57:7c:d7",
                "DriverOpts": null,
                "GwPriority": 0,
                "NetworkID": "04e8a536e9e74a988f8c130fc988941491a18402a0152faf9160c8f4d536acde",
                "EndpointID": "4e4afefc6b7defc593be7958231b7db15026462448942cd72075334ea6fa20a3",
                "Gateway": "172.19.0.1",
                "IPAddress": "172.19.0.3",
                "IPPrefixLen": 16,
                "IPv6Gateway": "",
                "GlobalIPv6Address": "",
                "GlobalIPv6PrefixLen": 0,
                "DNSNames": [
                    "mariadb_db",
                    "4076cce2e67b"
```

- docker network inspect front_back:

```
    "Name": "front_back",
    "Id": "de0a81992c070f7a9ef5b59ea4010340d2213eeb7e095c2d9bca9862c546b485",
    "Created": "2025-08-03T00:52:30.649270278Z",
    "Scope": "local",
    "Driver": "bridge",
    "EnableIPv4": true,
    "EnableIPv6": false,
    "IPAM": {
        "Driver": "default",
        "Options": {},
        "Config": [
            {
                "Subnet": "172.18.0.0/16",
                "Gateway": "172.18.0.1"
            }
        ]
    },
    "Internal": false,
    "Attachable": false,
    "Ingress": false,
    "ConfigFrom": {
        "Network": ""
    },
    "ConfigOnly": false,
    "Containers": {
        "5f9920503ed7f933f9b9221a66b0d292f73802411e00294e1dc6a9fac488324b": {
            "Name": "flask_app",
            "EndpointID": "b7750f560cb37d8b80fcf01098ce38ebe2a869646ce719bb618acdb312488e84",
            "MacAddress": "f2:10:c6:f4:ee:69",
            "IPv4Address": "172.18.0.3/16",
            "IPv6Address": ""
        },
        "7a0f816da90afba4ccb6a87b0a5c60fe594745cc23444be928ac5355f0101d5f": {
            "Name": "nginx_con",
            "EndpointID": "24970fff9ebe09b8a7c08b2cc385f365b752845efd51984e2adea3a889b9010e",
```

- docker network inspect back_db:

        "Name": "back_db",
        "Id": "04e8a536e9e74a988f8c130fc988941491a18402a0152faf9160c8f4d536acde",
        "Created": "2025-08-03T00:52:44.997169891Z",
        "Scope": "local",
        "Driver": "bridge",
        "EnableIPv4": true,
        "EnableIPv6": false,
        "IPAM": {
            "Driver": "default",
            "Options": {},
            "Config": [
                {
                    "Subnet": "172.19.0.0/16",
                    "Gateway": "172.19.0.1"
                }
            ]
        },
        "Internal": false,
        "Attachable": false,
        "Ingress": false,
        "ConfigFrom": {
            "Network": ""
        },
        "ConfigOnly": false,
        "Containers": {
            "4076cce2e67bb5663d8a09dab5638e512644cff97f34f5ef34b0a78dea22494b": {
                "Name": "mariadb_db",
                "EndpointID": "4e4afefc6b7defc593be7958231b7db15026462448942cd72075334ea6fa20a3",
                "MacAddress": "46:bf:66:57:7c:d7",
                "IPv4Address": "172.19.0.3/16",
                "IPv6Address": ""
            },
            "5f9920503ed7f933f9b9221a66b0d292f73802411e00294e1dc6a9fac488324b": {
                "Name": "flask_app",
                "EndpointID": "6c238e024c96178a1723ee414cba0250c8fee007d6ad9bcce127a775e9cbbc23",
                "MacAddress": "72:73:57:ca:57:b0",

6. exec in the nginx container, curl the ip:port of your flask app:

```
soha@ubuntu:~$ docker inspect -f '{{range $k, $v := .NetworkSettings.Networks}}{{$k}} => {{$v.IPAddress}}{{"\n"}}{{end}}' flask_app
back_db => 172.19.0.2
front_back => 172.18.0.3
```

```
soha@ubuntu:~$ docker exec -it nginx_con bash
root@7a0f816da90a:/# curl http://172.18.0.3:5000
Hello, Docker!root@7a0f816da90a:/#
```