

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

Федеральное государственное автономное образовательное учреждение высшего образования

Санкт-Петербургский национальный исследовательский университет информационных
технологий, механики и оптики

Мегафакультет трансляционных информационных технологий

Факультет информационных технологий и программирования

Лабораторная работа № 05

По дисциплине «Администрирование в ОС Linux»

Выполнили студенты группы №М33091

Ларин Владислав Денисович

Проверила

Шараева Кристина Валерьевна

САНКТ-ПЕТЕРБУРГ
2021

1) Установка

```
Verifying      : python3-dnf-plugins-core-4.0.12-3.el8.noarch                23/41 Verifying      : python3-policycoreutils-2.9-16.el8.noarch          13/23
Verifying      : python3-hawkey-0.63.0-3.el8.x86_64                      24/41 Verifying      : python3-setools-4.3.0-2.el8.x86_64              14/23
Verifying      : python3-libdnf-0.39.1-5.el8.x86_64                      25/41 Verifying      : containerd.io-1.4.12-3.1.el8.x86_64            15/23
Verifying      : python3-libdnf-0.63.0-3.el8.x86_64                      26/41 Verifying      : docker-ce-3:20.10.12-3.el8.x86_64              16/23
Verifying      : python3-libdnf-0.39.1-5.el8.x86_64                      27/41 Verifying      : docker-ce-cli-1:20.10.12-3.el8.x86_64            17/23
Verifying      : python3-rpm-4.14.3-19.el8.x86_64                        28/41 Verifying      : docker-ce-rootless-extras-20.10.12-3.el8.x86_64    18/23
Verifying      : python3-rpm-4.14.2-37.el8.x86_64                        29/41 Verifying      : docker-scan-plugin-0.12.0-3.el8.x86_64            19/23
Verifying      : rpm-4.14.3-19.el8.x86_64                                 30/41 Verifying      : libsemanage-2.9-6.el8.x86_64                        20/23
Verifying      : rpm-4.14.2-37.el8.x86_64                                 31/41 Verifying      : libsemanage-2.9-2.el8.x86_64                        21/23
Verifying      : rpm-build-libs-4.14.3-19.el8.x86_64                    32/41 Verifying      : policycoreutils-2.9-16.el8.x86_64                    22/23
Verifying      : rpm-build-libs-4.14.2-37.el8.x86_64                    33/41 Verifying      : policycoreutils-2.9-9.el8.x86_64                      23/23
Verifying      : rpm-libs-4.14.3-19.el8.x86_64                           34/41
Verifying      : rpm-libs-4.14.2-37.el8.x86_64                           35/41 Upgraded:
Verifying      : rpm-plugin-selinux-4.14.3-19.el8.x86_64                 36/41 libsemanage-2.9-6.el8.x86_64
Verifying      : rpm-plugin-selinux-4.14.2-37.el8.x86_64                 37/41 Installed:
Verifying      : rpm-plugin-sysd-inhibit-4.14.3-19.el8.x86_64             38/41 checkpolicy-2.9-1.el8.x86_64
Verifying      : rpm-plugin-sysd-inhibit-4.14.2-37.el8.x86_64             39/41 container-selinux-2:2.167.0-1.module.el8.5.0+911-f19812f9.noarch
Verifying      : yum-4.7.0-4.el8.noarch                                     40/41 containerd.io-1.4.12-3.1.el8.x86_64
Verifying      : yum-4.2.17-6.el8.noarch                                   41/41 docker-ce-3:20.10.12-3.el8.x86_64
                                                                    docker-ce-cli-1:20.10.12-3.el8.x86_64
                                                                    docker-ce-rootless-extras-20.10.12-3.el8.x86_64
                                                                    docker-scan-plugin-0.12.0-3.el8.x86_64
                                                                    fuse-common-3.2.1-12.el8.x86_64
                                                                    fuse-overlayfs-1.7.1-1.module.el8.5.0+890-6b136101.x86_64
                                                                    fuse3-3.2.1-12.el8.x86_64
                                                                    fuse3-libs-3.2.1-12.el8.x86_64
                                                                    libseccomp-0.41-19.el8.x86_64
                                                                    libslirp-4.4.0-1.module.el8.5.0+890-6b136101.x86_64
                                                                    policycoreutils-python-utils-2.9-16.el8.noarch
                                                                    python3-audit-3.0.0-17.20191104gitc2876.el8.x86_64
                                                                    python3-libsemanage-2.9-6.el8.x86_64
                                                                    python3-policycoreutils-2.9-16.el8.noarch
                                                                    python3-setools-4.3.0-2.el8.x86_64
                                                                    slirp4netns-1.1.0-1.module.el8.5.0+890-6b136101.x86_64

Upgraded:
dnf-4.7.0-4.el8.noarch                dnf-data-4.7.0-4.el8.noarch
dnf-plugins-core-4.0.12-3.el8.noarch  libdnf-0.63.0-3.el8.x86_64
libdnf-0.63.0-3.el8.x86_64            librepo-1.14.0-2.el8.x86_64
libsolu-0.7.19-1.el8.x86_64           python3-dnf-4.7.0-4.el8.noarch
python3-dnf-plugins-core-4.0.21-3.el8.noarch python3-hawkey-0.63.0-3.el8.x86_64
python3-libdnf-0.63.0-3.el8.x86_64    python3-rpm-4.14.3-19.el8.x86_64
rpm-4.14.3-19.el8.x86_64              rpm-build-libs-4.14.3-19.el8.x86_64
rpm-libs-4.14.3-19.el8.x86_64         rpm-plugin-selinux-4.14.3-19.el8.x86_64
rpm-plugin-sysd-inhibit-4.14.3-19.el8.x86_64 rpm-plugin-selinux-4.14.2-37.el8.x86_64
rpm-plugin-sysd-inhibit-4.14.2-37.el8.x86_64 yum-4.7.0-4.el8.noarch

Installed:
libmodulemd-2.13.0-1.el8.x86_64  python3-unbound-1.7.3-17.el8.x86_64 tpm2-tss-2.3.2-4.el8.x86_64
unbound-libs-1.7.3-17.el8.x86_64 yum-utils-4.0.21-3.el8.noarch

Complete!
[root@localhost ~]# _

Complete!
[root@localhost ~]# _

Dependencies resolved.
=====
Package      Architecture Version      Repository      Size
=====
Downgrading:
docker-ce    x86_64      3:20.10.9-3.el8 docker-ce-stable 22 M
docker-ce-cli x86_64      1:20.10.9-3.el8 docker-ce-stable 29 M
Transaction Summary
=====
Downgrade 2 Packages
Total download size: 51 M
Is this ok [y/N]: y
Downloading Packages:
(1/2): docker-ce-20.10.9-3.el8.x86_64.rpm 3.1 MB/s | 22 MB 00:07
(2/2): docker-ce-cli-20.10.9-3.el8.x86_64.rpm 4.0 MB/s | 29 MB 00:07
Total 6.9 MB/s | 51 MB 00:07
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing :
Running scriptlet: docker-ce-cli-1:20.10.9-3.el8.x86_64
Downgrading : docker-ce-cli-1:20.10.9-3.el8.x86_64
Running scriptlet: docker-ce-cli-1:20.10.9-3.el8.x86_64
Downgrading : docker-ce-3:20.10.9-3.el8.x86_64
Downgrading : docker-ce-3:20.10.9-3.el8.x86_64
Running scriptlet: docker-ce-3:20.10.9-3.el8.x86_64
Running scriptlet: docker-ce-3:20.10.12-3.el8.x86_64
Cleanup : docker-ce-3:20.10.12-3.el8.x86_64
Running scriptlet: docker-ce-3:20.10.12-3.el8.x86_64
Cleanup : docker-ce-3:20.10.12-3.el8.x86_64
Running scriptlet: docker-ce-3:20.10.12-3.el8.x86_64
[root@localhost ~]#

Transaction Summary
=====
Install 1 Package
Total download size: 5.7 M
Installed size: 32 M
Is this ok [y/N]: y
Downloading Packages:
git-core-2.27.0-1.el8.x86_64.rpm 6.2 MB/s | 5.7 MB 00:00
Total 4.4 MB/s | 5.7 MB 00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
1/1 Installing :
1/1 Installing : git-core-2.27.0-1.el8.x86_64
1/1 Running scriptlet: git-core-2.27.0-1.el8.x86_64
1/1 Verifying : git-core-2.27.0-1.el8.x86_64
1/1 Installed:
3/4 git-core-2.27.0-1.el8.x86_64
4/4 Complete!
[root@localhost ~]#
```

2) Тестовый запуск

```
Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

[ 2766.415186] veth2e22d84: renamed from eth0
[ 2766.421116] docker0: port 1(vethde35f12) entered disabled state
[ 2766.451772] docker0: port 1(vethde35f12) entered disabled state
[ 2766.454864] device vethde35f12 left promiscuous mode
[ 2766.455527] docker0: port 1(vethde35f12) entered disabled state
[root@localhost ~]# _
```

3) Клонирование репозитория

```
[root@localhost lab5]# git clone https://github.com/rrraund/django-locallibrary-tutorial
Cloning into 'django-locallibrary-tutorial'...
remote: Enumerating objects: 490, done.
remote: Counting objects: 100% (191/191), done.
remote: Compressing objects: 100% (54/54), done.
remote: Total 490 (delta 152), reused 137 (delta 137), pack-reused 299
Receiving objects: 100% (490/490), 248.21 KiB | 1.30 MiB/s, done.
Resolving deltas: 100% (281/281), done.
[root@localhost lab5]#
```

4) Создание .env

```
[root@localhost django-locallibrary-tutorial]# touch .env
[root@localhost django-locallibrary-tutorial]# ls
catalog      LICENSE      manage.py   README.md   runtime.txt
CODE_OF_CONDUCT.md  locallibrary Procfile    requirements.txt  templates
[root@localhost django-locallibrary-tutorial]# ls -a
.  catalog  .env  .github  LICENSE  manage.py  README.md  runtime.txt
.. CODE_OF_CONDUCT.md .git  .gitignore locallibrary Procfile    requirements.txt  templates
[root@localhost django-locallibrary-tutorial]#
```

```
[root@localhost django-locallibrary-tutorial]# cat .env
SECRET_KEY="Secret_key"
DEBUG=True
```

5) Настройка окружения

```
[root@localhost django-locallibrary-tutorial]# python3.7 -m venv venv
[root@localhost django-locallibrary-tutorial]# ls
catalog      LICENSE      manage.py   README.md   runtime.txt  venv
CODE_OF_CONDUCT.md  locallibrary Procfile    requirements.txt  templates
[root@localhost django-locallibrary-tutorial]# source venv/bin/activate
(venv) [root@localhost django-locallibrary-tutorial]#
```

6) Установка зависимостей

```
Successfully installed Django-3.1.2 asgiref-3.2.10 dj-database-url-0.5.0 gunicorn-20.0.4 psycopg2-binary-2.8.6 pytz-2021.3 sqlparse-0.4.2 wheel-0.35.1 whitenoise-5.2.0
```

```
(venv) [root@localhost django-locallibrary-tutorial]# pip freeze
asgiref==3.2.10
dj-database-url==0.5.0
Django==3.1.2
gunicorn==20.0.4
psycopg2-binary==2.8.6
pytz==2021.3
sqlparse==0.4.2
whitenoise==5.2.0
(venv) [root@localhost django-locallibrary-tutorial]#
```

7) Развернутый проект (локально)

10.9.8.16:8000/catalog/ ☆

Local Library Home

Welcome to *LocalLibrary*, a very basic Django website developed as a [tutorial example](#) on the Mozilla Developer Network.

The tutorial demonstrates how to create a Django skeleton website and application, define URL mappings, views (including Generic List and Detail Views), models and templates.

UML Models

An UML diagram of the site's Django model structure is shown below.

```
classDiagram
    class Book {
        +title: String
        +author: Author[]
        +summary: String
        +ISBN: String
        +genre: Genre[]
        +language: Language[]
        +__str__: String
    }
    class Author {
        +name: String
        +date_of_birth: DateField
        +date_of_death: DateField
        +books: Book[]
        +__str__: String
    }
    class Genre {
        +name: String
        +__str__: String
    }
    class Language {
        +name: String
        +__str__: String
    }
    class BookInstance {
        +uniqueid: String
        +due_book_date: DateField
        +status: LOAN_STATUS
        +book: Book[]
        +imprint: String
        +borrower: User[]
        +__str__: String
    }
    Book "1" -- "0..*" Genre
    Book "1" -- "0..*" Language
    Book "1" -- "0..*" BookInstance
    Author "1" -- "0..*" Book
    Genre "1" -- "0..*" Book
    Language "1" -- "0..*" Book
    BookInstance "1" -- "0..*" Book
```

Dynamic content

The library has the following record counts:

- Books: 0
- Copies: 0
- Copies available: 0
- Authors: 0

8) Создание файлов для запуска в Docker

```
[root@localhost /]# ls
bin    docker-compose.yml  etc    lib64    mnt      proc  sbin  tmp
boot  Dockerfile.django  home   lost+found  nginx.conf  root  srv   usr
dev    Dockerfile.nginx    lib    media    opt      run   sys   var
```

```
[root@localhost /]# cat Dockerfile.django
FROM python:3
COPY . ./app
RUN rm -rf ./app/staticfiles
RUN rm -rf ./app/catalog/static
WORKDIR ./app
RUN pip install --upgrade pip
RUN pip3 install -r requirements.txt && python3 manage.py
makemigrations && python3 manage.py migrate
CMD gunicorn locallibrary.wsgi:application --bind 0.0.0.0:8000
```

```
[root@localhost /]# cat Dockerfile.nginx
FROM nginx
COPY nginx.conf /etc/nginx/conf.d/default.conf
```

```
[root@localhost /]# cat docker-compose.yml
version: "3"
services:
  app:
    container_name: app
    build:
      context: .
      dockerfile: Dockerfile.django
  nginx:
    container_name: nginx
    ports:
      - 80:80
    build:
      context: .
      dockerfile: Dockerfile.nginx
    links:
      - app
    volumes:
      - ./staticfiles:/var/html/static/ }
```

```
[root@localhost /]# cat docker-compose.yml
version: "3"
services:
  app:
    container_name: app
    build:
      context: .
      dockerfile: Dockerfile.django
  nginx:
    container_name: nginx
    ports:
      - 80:80
    build:
      context: .
      dockerfile: Dockerfile.nginx
    links:
      - app
    volumes:
      - ./staticfiles:/var/html/static/
[root@localhost /]# cat nginx.conf
server {
    listen 80;
    location / {
        proxy_pass http://app:8000/;
    }
    location /static/ {
        alias /var/html/static/;
    }
}
```

9) Файл .github/workflows/main.yml

```
name: Run Tests
on: [push]
jobs:
  TEST PYTHON:
    runs-on: ubuntu-20.04
    steps:
      - name: Check out repository code
        uses: actions/checkout@v2
      - run: ls -la
      - name: Run Scripts to test
        run: pip3 install -r requirements.txt
      - run: python3 manage.py migrate
      - run: python3 manage.py collectstatic
      - run: python3 manage.py test
```

10) Репозиторий: <https://github.com/rrraund/django-locallibrary-tutorial>

