Звіт
Лабораторна робота 4
ТЕХНОЛОГІЇ ПРОГРАМУВАННЯ
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Тема: Основи Docker
Мета: розглянути принципи контейнеризації програмного забезпечення; навчитися використовувати Docker як один із засобів контейнеризації.

https://github.com/Utilka/univ_programming_technologies_proj

Содержание докерфайла

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ cat Dockerfile

FROM python

WORKDIR /usr/src/app

COPY . .

RUN python ./unitTest.py

CMD [ "python", "./main.py" ]
```

билдим проект

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_techng
technologies/univ_programming_technologies_proj$ docker build --tag lab4 .

Sending build context to Docker daemon  14.98MB
Step 1/5 : FROM python
 ---> bbf31371d67d
Step 2/5 : WORKDIR /usr/src/app
 ---> Running in 13c1ee732b42
Removing intermediate container 13c1ee732b42
 ---> 0170bd60af30
Step 3/5 : COPY . .
 ---> 03578f76d6b8
Step 4/5 : RUN python ./unitTest.py
 ---> Running in 6ab5c38cc160
test_sorting (__main__.TestArr) ... ok
test_reverse_sorting (__main__.TestArr) ... ok
test_duplicates_removal (__main__.TestArr) ... ok
test_universality (__main__.TestArr) ... ok
test_merge (__main__.TestArr) ... ok
test_exceptions (__main__.TestArr) ... ok

----------------------------------------------------------------------
Ran 6 tests in 0.002s

OK
Removing intermediate container 6ab5c38cc160
```

```
 ---> 525675d1dcc7
Step 5/5 : CMD [ "python", "./main.py" ]
 ---> Running in 71875efc053a
Removing intermediate container 71875efc053a
 ---> 358333501962
Successfully built 358333501962
Successfully tagged lab4:latest

utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker image ls

REPOSITORY            TAG                 IMAGE ID            CREATED
SIZE
lab4                  latest              358333501962        59 minutes ago
898MB
jenkinsci/blueocean   latest              3a3e75633bd9        3 weeks ago
755MB
bulletinboard         1.0                 fb4e75b7a772        3 weeks ago
184MB
node                  current-slim        855a1cd7a580        3 weeks ago
167MB
python                latest              bbf31371d67d        4 weeks ago
882MB
docker                dind                b3893e48cf28        5 weeks ago
232MB
hello-world           latest              bf756fb1ae65        9 months ago
13.3kB
```

запускаем

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker run --name
lab4_r lab4:latest

[1, 2, 3, 6]


## code:
def main():
    ar1 = SortedListNoDubl([1, 6, 2, 3])
    print(ar1)
```

для второго задания переделаем нашу программу под сервис, а также скажем ей записать информацию в ее среду

новый код

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ cat flask_main.py

from flask import Flask
app = Flask(__name__)
from sortedListNoDubl import SortedListNoDubl

@app.route(&apos;/&apos;)
def hello():
```

```
    ar1 = SortedListNoDubl([1, 6, 2, 3])
    return "Hello World! {}".format(ar1)

if __name__ == &apos;__main__&apos;:
    f = open("text.txt", "w")
    f.write("content")
    f.close()
    app.run()
```

новый докерфайл

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ cat Dockerfile

FROM python

WORKDIR /usr/src/app

COPY requirements.txt ./
RUN pip install --no-cache-dir -r requirements.txt

COPY . .

RUN python ./unitTest.py

CMD [ "python3", "./flask_main.py" ]
```

билдим запускаем

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker build --tag
lab4:2 .

Sending build context to Docker daemon  15.38MB
Step 1/7 : FROM python
 ---> bbf31371d67d
Step 2/7 : WORKDIR /usr/src/app
 ---> Using cache
 ---> 0170bd60af30
Step 3/7 : COPY requirements.txt ./
 ---> 36f08be72fd8
Step 4/7 : RUN pip install --no-cache-dir -r requirements.txt
 ---> Running in 2bff652f0534
Collecting Flask
  Downloading Flask-1.1.2-py2.py3-none-any.whl (94 kB)
Collecting click>=5.1
  Downloading click-7.1.2-py2.py3-none-any.whl (82 kB)
Collecting Werkzeug>=0.15
  Downloading Werkzeug-1.0.1-py2.py3-none-any.whl (298 kB)
Collecting itsdangerous>=0.24
  Downloading itsdangerous-1.1.0-py2.py3-none-any.whl (16 kB)
Collecting Jinja2>=2.10.1
  Downloading Jinja2-2.11.2-py2.py3-none-any.whl (125 kB)
Collecting MarkupSafe>=0.23
  Downloading MarkupSafe-1.1.1-cp38-cp38-manylinux1_x86_64.whl (32 kB)
Installing collected packages: click, Werkzeug, itsdangerous, MarkupSafe,
Jinja2, Flask
Successfully installed Flask-1.1.2 Jinja2-2.11.2 MarkupSafe-1.1.1 Werkzeug-1.0.1
click-7.1.2 itsdangerous-1.1.0
WARNING: You are using pip version 20.2.3; however, version 20.2.4 is available.
```

```
You should consider upgrading via the &apos;/usr/local/bin/python -m pip install
--upgrade pip&apos; command.
Removing intermediate container 2bff652f0534
 ---> 99d96c6953bf
Step 5/7 : COPY . .
 ---> 18e93bc9614f
Step 6/7 : RUN python ./unitTest.py
 ---> Running in 42a5ea9c21c6
test_sorting (__main__.TestArr) ... ok
test_reverse_sorting (__main__.TestArr) ... ok
test_duplicates_removal (__main__.TestArr) ... ok
test_universality (__main__.TestArr) ... ok
test_merge (__main__.TestArr) ... ok
test_exceptions (__main__.TestArr) ... ok

----------------------------------------------------------------------
Ran 6 tests in 0.002s

OK
Removing intermediate container 42a5ea9c21c6
 ---> f0364892efc4
Step 7/7 : CMD [ "python3", "./flask_main.py" ]
 ---> Running in 13cdf039299c
Removing intermediate container 13cdf039299c
 ---> 859226140695
Successfully built 859226140695
Successfully tagged lab4:2
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker run --
publish 8000:5000 --detach --name lab4_2 lab4:2

c50e7d864c951c2386df6658abd9c7fa1e266dc214bce2907c482386cd6cb4ef
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED
STATUS              PORTS                    NAMES
c50e7d864c95        lab4:2              "python3 ./flask_mai…"   About a minute
ago   Up About a minute   0.0.0.0:8000->5000/tcp   lab4_2
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$
```

создаем новый образ из уже запущенного контейнера

```
utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker commit
lab4_2 lab4_commited:2
sha256:efcb33f14a0d84ad5670b49872c2bce6824f8bf7007f855ebc37dcdc6b678817

utilka@utilka-Inspiron-3580:~/Personal/productivity_stuff/univer/sem_5/
Programming technologies/univ_programming_technologies_proj$ docker image ls
REPOSITORY            TAG                 IMAGE ID            CREATED
SIZE
lab4_commited         2                   efcb33f14a0d        8 seconds ago
906MB
lab4                  2                   859226140695        10 minutes ago
906MB
lab4                  latest              358333501962        3 hours ago
898MB
jenkinsci/blueocean   latest              3a3e75633bd9        3 weeks ago
755MB
bulletinboard         1.0                 fb4e75b7a772        3 weeks ago
184MB
```

```
node                current-slim        855a1cd7a580        3 weeks ago
167MB
python              latest              bbf31371d67d        4 weeks ago
882MB
docker              dind                b3893e48cf28        5 weeks ago
232MB
hello-world         latest              bf756fb1ae65        9 months ago
13.3kB
```

Выводы:
розглянули принципи контейнеризації програмного забезпечення;
навчилися використовувати Docker як один із засобів контейнеризації.