

به نام خدا

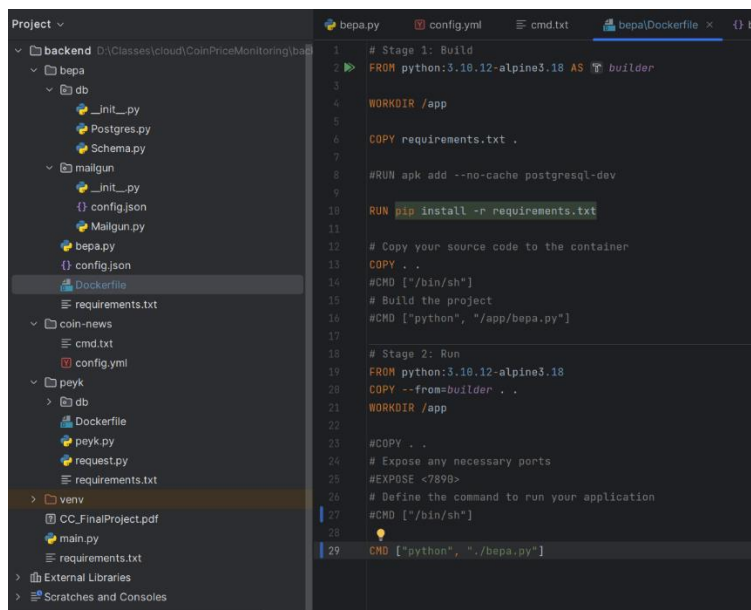
## گزارش پروژه نهایی رایانش ابری

مریم کرمانشاهانی - ۹۷۲۳۰۷۳

ثمین مهدی پور - ۹۸۳۹۰۳۹

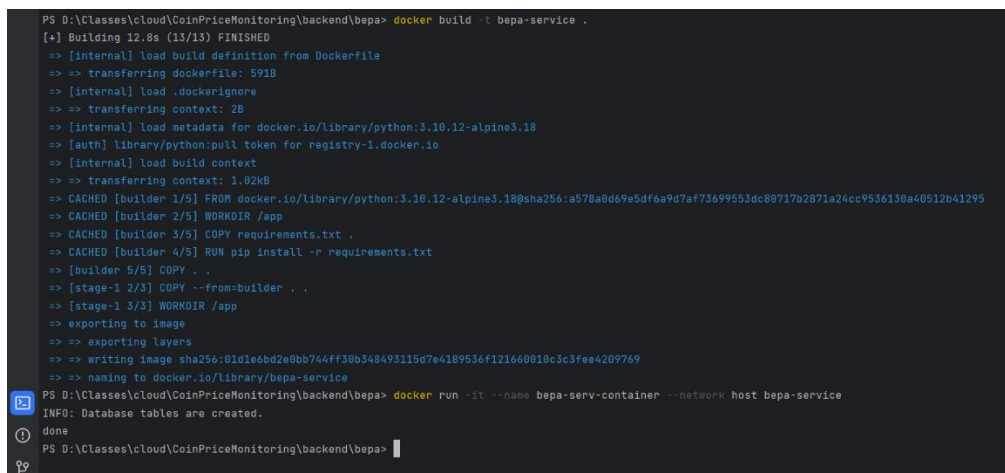
بخش بپا)

داکر فایل به صورت زیر تعریف شد



The screenshot shows a code editor with a project explorer on the left and a code editor on the right. The project explorer shows a directory structure for a project named 'backend'. The code editor shows the content of a Dockerfile, which defines a multi-stage build process. The first stage, 'Build', starts from a python:3.10.12-alpine3.18 AS builder, sets the working directory to /app, copies requirements.txt, and runs pip install -r requirements.txt. The second stage, 'Run', starts from the same python:3.10.12-alpine3.18 image, copies the built application from the first stage, and sets the command to run the application.

با دستورات زیر ایمج را ساختیم و کانتنر را ران کردیم



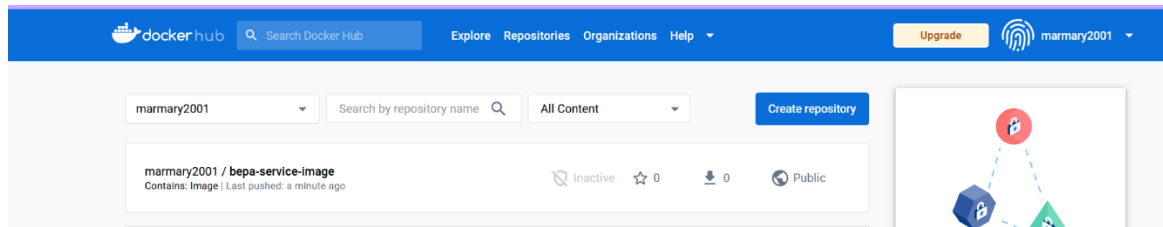
The screenshot shows a terminal window with the following commands and output:

```
PS D:\Classes\cloud\CoinPriceMonitoring\backend\bepa> docker build -t bepa-service .
[+] Building 12.8s (13/13) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 591B
=> [internal] load .dockerignore
=> => transferring context: 28B
=> [internal] load metadata for docker.io/library/python:3.10.12-alpine3.18
=> [auth] library/python:pull token for registry-1.docker.io
=> [internal] load build context
=> => transferring context: 1.02kB
=> CACHED [builder 1/5] FROM docker.io/library/python:3.10.12-alpine3.18@sha256:a578e8d69e5df6a9d7af73699553dc80717b2871a24cc9536130e40512b41295
=> CACHED [builder 2/5] WORKDIR /app
=> CACHED [builder 3/5] COPY requirements.txt .
=> CACHED [builder 4/5] RUN pip install -r requirements.txt
=> [builder 5/5] COPY . .
=> [stage-1 2/3] COPY --from=builder . .
=> [stage-1 3/3] WORKDIR /app
=> exporting to image
=> => exporting layers
=> writing image sha256:01d1e6bd2e0bb744ff30b348493115d7e4189536f121660010c3c3fee4209769
=> naming to docker.io/library/bepa-service
INFO: Database tables are created.
done
PS D:\Classes\cloud\CoinPriceMonitoring\backend\bepa> docker run -it --name bepa-serv-container --network host bepa-service
```

## دستورات برای قرار دادن در داکرهاب:

```
PS D:\Classes\cloud\CoinPriceMonitoring\backend\bepa> docker tag bepa-service marmary2001/bepa-service-image:1
PS D:\Classes\cloud\CoinPriceMonitoring\backend\bepa> docker push marmary2001/bepa-service-image:1
The push refers to repository [docker.io/marmary2001/bepa-service-image]
5f70bf18a086: Layer already exists
0359d6413ccf: Pushed
a580b860403a: Layer already exists
be6b7a740d80: Layer already exists
18e21c7b4116: Layer already exists
cd18acbc1cce: Mounted from library/python
78a822fe2a2d: Mounted from library/python
1: digest: sha256:96e08ae21d19fa859e9dc1ceaa2f986ad75a74364de88539dee1a82355159ff6 size: 1786
PS D:\Classes\cloud\CoinPriceMonitoring\backend\bepa>
```

## داکرهاب:



بخش پیک)

داکرفایل بصورت زیر تعریف شد:

```
# Stage 1: Build
FROM python:3.10.12-alpine3.18 AS builder

WORKDIR /app

COPY requirements.txt .

RUN apk add --no-cache gcc musl-dev libffi-dev openssl-dev

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

COPY . .

# Build the project (replace "peyk:app" with the filename if needed)
RUN python -m compileall -b . && rm -rf __pycache__

# Stage 2: Run
FROM python:3.10.12-alpine3.18

WORKDIR /app

COPY --from=builder /app .

RUN apk --no-cache add libpq

# Install Uvicorn and other dependencies
RUN pip install --no-cache-dir -r requirements.txt

# Expose the required port
EXPOSE 8080

# Set the entrypoint command
CMD ["uvicorn", "peyk:app", "--host", "0.0.0.0", "--port", "8080"]
```

ایمیج بصورت زیر ساخته شد:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>docker build -t peyk-server .
[+] Building 99.6s (16/16) FINISHED
=> [internal] load build definition from Dockerfile                                0.1s
=> => transferring dockerfile: 32B                                              0.0s
=> [internal] load .dockerignore                                                0.0s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/python:3.10.12-alpine3.18    3.4s
=> [auth] library/python:pull token for registry-1.docker.io                  0.0s
=> [internal] load build context                                                0.1s
=> => transferring context: 565B                                                0.0s
=> [builder 1/7] FROM docker.io/library/python:3.10.12-alpine3.18@sha256:a578a0d69e5df6a9d7af73699553dc80717b287 0.0s
=> CACHED [builder 2/7] WORKDIR /app                                           0.0s
=> CACHED [builder 3/7] COPY requirements.txt .                                0.0s
=> CACHED [builder 4/7] RUN apk add --no-cache gcc musl-dev libffi-dev openssl-dev 0.0s
=> CACHED [builder 5/7] RUN pip install --no-cache-dir -r requirements.txt      0.0s
=> [builder 6/7] COPY . .                                                      0.1s
=> [builder 7/7] RUN python -m compileall -b . && rm -rf __pycache__          2.2s
=> [stage-1 3/5] COPY --from=builder /app .                                    0.1s
=> [stage-1 4/5] RUN apk --no-cache add libpq                                  7.3s
=> [stage-1 5/5] RUN pip install --no-cache-dir -r requirements.txt            81.8s
=> exporting to image                                                         1.8s
=> => exporting layers                                                         1.7s
=> => writing image sha256:1aaa1575cd25b05787a48cd45c9bf91c6db3d7f4aa5f2a6848edf72de784baa0 0.0s
=> => naming to docker.io/library/peyk-server                                0.0s
```

آن را بصورت زیر ران کردیم:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>docker run -p 8080:8080 --name peyk-server peyk-server
INFO:      Started server process [1]
INFO:      Waiting for application startup.
INFO:      Application startup complete.
INFO:      Uvicorn running on http://0.0.0.0:8080 (Press CTRL+C to quit)
```


همانطور که مشاهده میشود سرور آماده پاسخگویی است.

آن را بصورت زیر در داکرهاب قرار دادیم:



```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>docker tag peyk-server precioux/peyk-server:latest

C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>docker push precioux/peyk-server:latest
The push refers to repository [docker.io/precioux/peyk-server]
2a43d4f32fae: Pushing  55.39MB/59.48MB
23b36fde1770: Pushed
04048931be8f: Pushed
f17e85f413e7: Pushed
a580b860403a: Mounted from library/python
be6b7a740d80: Mounted from library/python
18e21c7b4116: Mounted from library/python
cd18acbc1cce: Mounted from library/python
78a822fe2a2d: Mounted from library/python
^C
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>docker push precioux/peyk-server:latest
The push refers to repository [docker.io/precioux/peyk-server]
2a43d4f32fae: Pushed
23b36fde1770: Layer already exists
04048931be8f: Layer already exists
f17e85f413e7: Layer already exists
a580b860403a: Layer already exists
be6b7a740d80: Layer already exists
18e21c7b4116: Layer already exists
cd18acbc1cce: Layer already exists
78a822fe2a2d: Layer already exists
latest: digest: sha256:057de9b6f66b50bca16036fd6ec23f94aca749eca821b95e47e19f8ba23503b8 size: 2205
```

صحت کار را روی داکرهاب بررسی میکنیم:



**precioux** [Edit profile](#)


 Community User  Joined March 28, 2023



Repositories

Starred


Contributed

Displaying 1 to 4 repositories



precioux/peyk-server ·  0 ·  0

By [precioux](#) · Updated 7 minutes ago

 Image

همانطور که مشاهده میشود فایل با موفقیت روی داکرهاب قرار داده شده است.

## گام سوم-

موارد زیر را در گزارش خود بیاورید.

- با استفاده از دستور `kubectl get` صحت ایجاد منابع بر روی کلاستر را نمایش دهید.
- آدرس آی پی<sup>۲۱</sup> پادها و نحوه برقراری ارتباط میان آنها و سرویس ساخته شده.
- برای دیپلویمنت مربوط به پایگاه داده چه تعداد پاد ایجاد کردید؟ دلیل کار خود را توضیح دهید.
- به کمک یک پاد با ایمیج کرل<sup>۲۲</sup> و یا قابلیت `port-forwarding` کوبرنتیز، سیستم نهایی خود را بیازمایید. تصاویر صحت عملکرد درخواست‌های `subscribe_coin` و `get_price_history` و ارسال ایمیل به کاربر را بیاورید.

منابع به صورت زیر خواهند بود:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend>kubectl get all
NAME                                READY    STATUS      RESTARTS      AGE
pod/bepa-cronjob-28134573-6nw5l     0/1      Completed   0              7m48s
pod/bepa-cronjob-28134576-2586z     0/1      Completed   0              4m48s
pod/bepa-cronjob-28134579-7gsck     0/1      Completed   0              108s
pod/coinnews-79b6fb6c49-sqmxs      1/1      Running     0              3h17m
pod/db-deployment-6f487688f6-5m8m7 1/1      Running     0              29m
pod/fastapi-server-deployment-768857fcd-2hdw 1/1      Running     6 (3h21m ago) 40d
pod/fastapi-server-deployment-768857fcd-9qmhh 1/1      Running     6 (3h21m ago) 40d
pod/peyk-server-deployment-6bd7776bbf-wxrrb 1/1      Running     0              7m13s
pod/redis-cache-deployment-6f4bc5558d-nmng9 1/1      Running     7 (3h21m ago) 40d
pod/ubuntu-deployment-546bf655c4-bpw 1/1      Running     7 (3h21m ago) 43d

NAME                                TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
service/coinnews                    ClusterIP      10.107.175.133  <none>            8000/TCP          3h17m
service/db-service                   ClusterIP      10.111.182.196  <none>            5432/TCP          8h
service/fastapi-server-service       ClusterIP      10.103.236.244  <none>            8000/TCP          40d
service/kubernetes                   ClusterIP      10.96.0.1        <none>            443/TCP          46d
service/peyk-server-service          ClusterIP      10.107.126.126  <none>            8080/TCP          8h
service/redis-service                ClusterIP      10.100.56.166   <none>            6379/TCP          40d

NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/coinnews             1/1      1              1            3h17m
deployment.apps/db-deployment        1/1      1              1            29m
deployment.apps/fastapi-server-deployment 2/2      2              2            40d
deployment.apps/peyk-server-deployment 1/1      1              1            7m13s
deployment.apps/redis-cache-deployment 1/1      1              1            40d
deployment.apps/ubuntu-deployment     1/1      1              1            43d

NAME                                DESIRED    CURRENT    READY    AGE
replicaset.apps/coinnews-79b6fb6c49 1           1           1        3h17m
replicaset.apps/db-deployment-6f487688f6 1           1           1        29m
replicaset.apps/fastapi-server-deployment-768857fcd 2           2           2        40d
replicaset.apps/peyk-server-deployment-6bd7776bbf 1           1           1        7m13s
replicaset.apps/redis-cache-deployment-6f4bc5558d 1           1           1        40d
replicaset.apps/ubuntu-deployment-546bf655c4 1           1           1        43d

NAME                                SCHEDULE      SUSPEND    ACTIVE    LAST SCHEDULE    AGE
cronjob.batch/bepa-cronjob          */3 * * * *   False     0         108s             19m

NAME                                COMPLETIONS    DURATION    AGE
job.batch/bepa-cronjob-28134573     1/1            14s         7m48s
job.batch/bepa-cronjob-28134576     1/1            15s         4m48s
job.batch/bepa-cronjob-28134579     1/1            22s         108s
```

- آدرس آی پی پادها و نحوه ارتباطشان:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>kubectl get pods -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE   READINESS GATES
bepa-cronjob-28134816-wdr9g         0/1     Completed 0           7m29s  10.244.1.177  minikube   <none>            <none>
bepa-cronjob-28134819-vqsbw         0/1     Completed 0           4m29s  10.244.1.178  minikube   <none>            <none>
bepa-cronjob-28134822-6hspm         0/1     Completed 0           89s    10.244.1.179  minikube   <none>            <none>
coinnews-79b6fb6c49-sqmxm         1/1     Running   0           7h20m  10.244.1.51   minikube   <none>            <none>
db-deployment-6f487688f6-g476x     1/1     Running   0           3h15m  10.244.1.109  minikube   <none>            <none>
fastapi-server-deployment-768857fcd-2hdww 1/1     Running   6 (7h24m ago) 40d    10.244.1.43   minikube   <none>            <none>
fastapi-server-deployment-768857fcd-9qmhh 1/1     Running   6 (7h24m ago) 40d    10.244.1.2    minikube   <none>            <none>
peyk-server-deployment-6bd7776bbf-mz2rf 1/1     Running   0           20m    10.244.1.172  minikube   <none>            <none>
redis-cache-deployment-6f4bc5558d-nmng9 1/1     Running   7 (7h24m ago) 40d    10.244.1.40   minikube   <none>            <none>
ubuntu-deployment-546bf655c4-bpwhr 1/1     Running   7 (7h24m ago) 43d    10.244.1.21   minikube   <none>            <none>
```

نحوه ارتباط پادها توسط سرویس هایی است که تعریف کردیم که آی پی آنها بصورت زیر است ولی میتوان به صورت اسمی نیز آنها را به همراه پورتشان استفاده کرد:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>kubectl get services -o wide
NAME                TYPE        CLUSTER-IP    EXTERNAL-IP  PORT(S)    AGE   SELECTOR
coinnews            ClusterIP   10.107.175.133 <none>       8000/TCP   7h24m  app=coinnews
db-service          ClusterIP   10.111.182.196 <none>       5432/TCP   12h    app=postgresdb
fastapi-server-service ClusterIP   10.103.236.244 <none>       8000/TCP   40d    app=fastapi-server-deployment
kubernetes          ClusterIP   10.96.0.1      <none>       443/TCP    46d    <none>
peyk-server-service ClusterIP   10.107.126.126 <none>       8080/TCP   12h    app=peyk-server
redis-service       ClusterIP   10.100.56.166  <none>       6379/TCP   40d    app=redis-cache-deployment
```

- یک پاد برای پایگاه داده استفاده شده چون درخواست ها از طریق سرویسی که برای آن تعبیر کرده بودیم بررسی و پاسخ دهی میشوند و نیازی به چندین پاد نداریم.

- بررسی صحت سیستم:

برای انجام اینکار از minikube service استفاده میکنیم تا به ما آی پی خروجی و قابل دسترس عمومی دهد:

برای سرویس پایگاه داده:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\peyk>minikube service db-service
```

NAMESPACE	NAME	TARGET PORT	URL
default	db-service		No node port

```
* service default/db-service has no node port
* Starting tunnel for service db-service.
```

NAMESPACE	NAME	TARGET PORT	URL
default	db-service		http://127.0.0.1:28875

```
* Opening service default/db-service in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```

برای سرویس پیک:

```
C:\Users\Samin\Desktop\University\Term 7\Cloud Computing\PF\CoinPriceMonitoring\backend\kuber\peyk>minikube service peyk-server-service
```

NAMESPACE	NAME	TARGET PORT	URL
default	peyk-server-service		No node port

```
* service default/peyk-server-service has no node port
* Starting tunnel for service peyk-server-service.
```

NAMESPACE	NAME	TARGET PORT	URL
default	peyk-server-service		http://127.0.0.1:31614

```
* Opening service default/peyk-server-service in default browser...
! Because you are using a Docker driver on windows, the terminal needs to be open to run it.
```



حالا فرانت را اجرا میکنیم:

localhost:3000

Interesting things CE Mental Health Tools Me Apply F

localhost:3000 says  
Subscription successful!  
OK

## Welcome to Peyk

Email:

Coin Name:

Price Change:

## Price History

Coin Name:

No price history data available.

مشاهده میکنیم که درخواست ما به درستی ثبت شده است:

	Id	Email	CoinName	DifferencePercentage
1	1	marmar@gmail.com	docoin	4
2	2	uni.mahdipour@gmail.com	docoin	4
3	3	uni.mahdipour@gmail.com	zerocoin	10
4	4	sa.mahdipour@gmail.com	zerocoin	10
5	5	sa.mahdipour@gmail.com	zerocoin	10
6	6	uni.mahdipour@gmail.com	bitcoin	10
7	7	uni.mahdipour@gmail.com	usdcoin	10

حالا گذشته usdcoin را بررسی میکنیم:

## Price History

Coin Name:

usdcoin

Get Price History

Timestamp	Price
2023-06-29T07:38:00.334349586Z	7999
2023-06-29T07:38:10.334567186Z	7999
2023-06-29T09:48:00.913601301Z	7980
2023-06-29T09:51:00.923189618Z	7984
2023-06-29T09:54:00.955764539Z	7977
2023-06-29T09:57:00.967522963Z	7979
2023-06-29T10:06:01.005967902Z	7979
2023-06-29T10:09:01.02191253Z	7982
2023-06-29T10:18:01.059361787Z	7981
2023-06-29T10:21:01.073555347Z	7980
2023-06-29T10:27:01.149861418Z	7979
2023-06-29T10:30:01.15922706Z	7994
2023-06-29T10:36:01.242624907Z	7998
2023-06-29T10:42:01.259954109Z	8000
2023-06-29T10:45:01.338299227Z	8007

مشاهده میشود که گذشته قیمت های این کوین به درستی آورده میشود.

همچنین میبینیم که برای ایمیل های ثبت شده پس از هر اپدیت ایمیل هشدار با توجه به کوین مدنظرشان ارسال شده است:

Hurry Up! bitcoin alert Spam x



mailgun@sandbox70b70422770e452daeb452a18e06b282.mailgun.org via sandbox.mgsend.net  
to me ▼

### Be careful with this message

The sender hasn't authenticated this message so Gmail can't verify that it actually came from them. Avoid clicking on links or providing sensitive information.

Looks safe

Hi, Notice that bitcoin is decreasing!