

به نام خدا

تمرین سری دوم رایانش ابری

مریم کرمانشاهانی - ۹۷۲۳۰۷۳

ابتدا یک فایل با نام Dockerfile نوشتیم و دستورات زیر را در آن قرار دادیم:

```
Dockerfile X Extension: Docker
Dockerfile > ...
1 FROM alpine:3.15.2
2
3 RUN apk add --no-cache curl
4
5 CMD ["/bin/sh"]
```

سپس در همان مسیری که این فایل قرار دارد دستور زیر را نوشتیم

`docker build -t my-alpine-curl-image .`

که نتیجه زیر را داد:

```
[*] Building 6.3s (4/6)
-> [internal] load build definition from Dockerfile
-> Building 11.7s (7/7) FINISHED
-> [internal] load build definition from Dockerfile
-> Building 0.0s
-> [internal] load .dockerignore
-> transferring context: 2B
-> [internal] load metadata for docker.io/library/alpine:3.15.2
-> [auth] library/alpine:pull token for registry-1.docker.io
-> [1/2] FROM docker.io/library/alpine:3.15.2@sha256:ceaa2849a625ef1a7e591d8288f1a58cdf1f4a8d8a7510c29a829e01
-> regular docker.io/library/alpine:3.15.2@sha256:ceaa2849a625ef1a7e591d8288f1a58cdf1f4a8d8a7510c29a829e01
-> sha256:0e832c08939f4e2f1a221834e2f2b7290a08029e9a0201a257c2d8aef6 1.47kB / 1.47kB
-> sha256:5a4a08bd192f1a221834e2f2b7290a08029e9a0201a257c2d8aef6 2.81kB / 2.81kB
-> sha256:ceaa2849a625ef1a7e591d8288f1a58cdf1f4a8d8a7510c29a829e01 1.64kB / 1.64kB
-> sha256:71c15300fa05b0a0506aa288809354aa4603a14542723f0e7b0c20cc0f 52kB / 52kB
-> extracting sha256:b8a08bd192f1a221834e2f2b7290a08029e9a0201a257c2d8aef6
-> [2/2] RUN apk add --no-cache curl
-> exporting to image
-> exporting layers
-> writing image sha256:005d0adffa7ab5845f40184f9ab8c8c2c1a767300382778b496af0d2f2072
-> naming to docker.io/library/my-alpine-curl-image
```

سپس به ترتیب دستور لاگین و دستورات دیگری را نوشتیم که هم در عکس هم در نوشته میبینید:

```
docker login
docker tag <local-image> <username>/<repository>:<tag>
docker push <username>/<repository>:<tag>
```


REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
url-shortener-image	latest	ce80b5289836	7 minutes ago	103MB
redis	latest	eca1379fe8b5	2 weeks ago	117MB
url-shortener	latest	c24e9398c794	3 weeks ago	103MB
python	3.12.0a7-alpine3.17	684b5c3712da	3 weeks ago	52.4MB
marmary2801/alpine-curl	latest	805d66a4fba7	4 weeks ago	7.68MB
my-alpine-curl-image	latest	805d66a4fba7	4 weeks ago	7.68MB
new-ubuntu	1.0	325de64446cd	5 weeks ago	216MB
ubuntu-upgraded	1.0	8db1c88bd953	5 weeks ago	217MB
marmary2801/ubuntu-upgraded	1.0	8db1c88bd953	5 weeks ago	217MB
nginx	latest	ac232564af84	5 weeks ago	142MB
httpd	latest	192d41583429	5 weeks ago	145MB
redis	<none>	31f08b98668e	5 weeks ago	117MB
mysql	latest	483a8bc460a9	5 weeks ago	530MB
mongo	latest	9a5e9d0cf6de	6 weeks ago	646MB
ubuntu	latest	88d22c8ceb15	7 weeks ago	77.8MB
ubuntu	20.04	1c5c8d8b973a	7 weeks ago	72.8MB
ubuntu	focal	1c5c8d8b973a	7 weeks ago	72.8MB
postgres	latest	3b6445d2c145	2 months ago	379MB
adminer	latest	dcabc6cf54dd	2 months ago	250MB
redis	6.2.6	3c3da61c4be0	12 months ago	113MB

ساخت کانتینر ردیس

```
(venv) PS D:\Classes\cloud\LinkShortener> docker run -d -p 6379:6379 -v cchw2vol:/data --network cchw2net --name cchw2redis redis
d9d1371c729c950d7aeb46b0f4ab4e734aea89584f639ee86d4d2d3ed9dcdf5
```

ساخت نتورک و والیوم برای برقراری ارتباط بین دو کانتینر

```
docker network create cchw2net
docker volume create cchw2vol
```

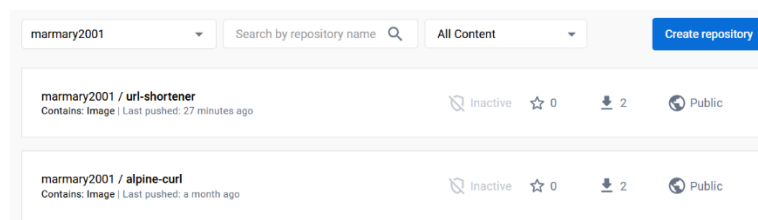
بیلد کردن ایمج :

```
(venv) PS D:\Classes\cloud\LinkShortener> docker build -t url-shortener-image .
[+] Building 1.0s (10/10) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 32B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:3.12.0a7-alpine3.17
=> [1/5] FROM docker.io/library/python:3.12.0a7-alpine3.17
=> [internal] load build context
=> => transferring context: 191.66kB
=> CACHED [2/5] WORKDIR /app
=> CACHED [3/5] COPY requirements.txt .
=> CACHED [4/5] RUN pip install -r requirements.txt
=> [5/5] COPY . .
=> exporting to image
=> => exporting layers
=> => writing image sha256:ce80b5289836cef431e2495490d501cdce45fd75d782dbe5ebd34a5b899bf464
=> => naming to docker.io/library/url-shortener-image
(venv) PS D:\Classes\cloud\LinkShortener>
```

ارسال ایمیل ساخته شده روی داکرهاب:

```
docker login
docker tag <local-image> <username>/<repository>:<tag>
docker push <username>/<repository>:<tag>
```

```
Terminal Local x Local (2) x + v
For better security, log in with a limited-privilege personal access token. Learn more at https://docs.docker.com/go/access-tokens/
(venv) PS D:\Classes\cloud\LinkShortener> docker tag url-shortener-image marmary2001/url-shortener:1
(venv) PS D:\Classes\cloud\LinkShortener> docker push marmary2001/url-shortener-image:1
The push refers to repository [docker.io/marmary2001/url-shortener-image]
An image does not exist locally with the tag: marmary2001/url-shortener-image
(venv) PS D:\Classes\cloud\LinkShortener> docker push marmary2001/url-shortener:1
The push refers to repository [docker.io/marmary2001/url-shortener]
efbd3454be4f: Pushed
7fc0e149dd76: Pushed
ba4e611d512e: Pushed
05779bf5a127: Pushed
f8553d910840: Mounted from library/python
55a477f3dfb3: Mounted from library/python
353ea322f1aa: Mounted from library/python
afe664e55619: Mounted from library/python
f1417ff83b31: Mounted from library/python
1: digest: sha256:30913a9d4cc4d3c88c2972e4f7feff71e6e9697b337b075510b86880d0912dd5d size: 2204
(venv) PS D:\Classes\cloud\LinkShortener>
```



:Inspect

```
Terminal Local x Local (2) x + v
{
  "Entrypoint": [
    "docker-entrypoint.sh"
  ],
  "OnBuild": null,
  "Labels": {}
},
"NetworkSettings": {
  "Bridge": "",
  "SandboxID": "e07a70d706b1bbcfccdb35704c4b9dc76fd80ddfea622469ded750f72489c5f9",
  "HairpinMode": false,
  "LinkLocalIPv6Address": "",
  "LinkLocalIPv6PrefixLen": 0,
  "Ports": {
    "6379/tcp": [
      {
        "HostIp": "0.0.0.0",
        "HostPort": "6379"
      }
    ]
  },
  "SandboxKey": "/var/run/docker/netns/e07a70d706b1",
  "SecondaryIPAddresses": null,
```

```
(venv) PS D:\Classes\cloud\LinkShortener> docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
7e1103febd55	url-shortener-image	"python /app/main.py"	38 minutes ago	Up 38 minutes	0.0.0.0:8001->8001/tcp	cchw2-url-shortener
d9d1371c729c	redis	"docker-entrypoint.s..."	About an hour ago	Up About an hour	0.0.0.0:6379->6379/tcp	cchw2redis

```
(venv) PS D:\Classes\cloud\LinkShortener>
```

ميزان منابع:

```
Terminal Local x Local (2) x + v
```

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %	NET I/O	BLOCK I/O	PIDS
7e1103febd55	cchw2-url-shortener	0.17%	28.66MiB / 7.70GiB	0.36%	16.2kB / 8.69kB	0B / 0B	1
d9d1371c729c	cchw2redis	0.13%	7.895MiB / 7.70GiB	0.10%	15.7kB / 7.14kB	0B / 0B	5

اجرا:

Name	Description				
url * required string (query)	<input type="text" value="https://www.youtube.com/watch?v=pTFZFxd4hOI"/>				
<button>Execute</button>					
Responses					
<p>Curl</p> <pre>curl -X 'POST' \ 'http://0.0.0.0:8001/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DpTFZFxd4hOI' \ -H 'accept: application/json' \ -d ''</pre> <p>Request URL</p> <pre>http://0.0.0.0:8001/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DpTFZFxd4hOI</pre> <p>Server response</p> <table><thead><tr><th>Code</th><th>Details</th></tr></thead><tbody><tr><td>200</td><td><p>Response body</p><pre>{ "longUrl": "https://www.youtube.com/watch?v=pTFZFxd4hOI", "shortUrl": "rebrand.ly/tvv87cb", "isCached": false, "hostname": "4f7d43cd4f47" }</pre></td></tr></tbody></table>		Code	Details	200	<p>Response body</p> <pre>{ "longUrl": "https://www.youtube.com/watch?v=pTFZFxd4hOI", "shortUrl": "rebrand.ly/tvv87cb", "isCached": false, "hostname": "4f7d43cd4f47" }</pre>
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Name	Description				
url * required string (query)	<input type="text" value="d/ww.youtube.com/watch?v=pg19Z8LL06w"/>				
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200	<p>Response body</p> <pre>{ "longUrl": "https://www.youtube.com/watch?v=pg19Z8LL06w", "shortUrl": "rebrand.ly/czvn3fx", "isCached": true, "hostname": "7e1183feb55" }</pre>				

گام سوم:

```
(venv) PS D:\Classes\cloud\LinkShortener\step3> kubectl get all
NAME                                READY   STATUS    RESTARTS   AGE
pod/alpinestep                      1/1     Running   0           130m
pod/alpinestep4                     1/1     Running   0           52m
pod/cche2redis-767f4bc88b-xc9n6     1/1     Running   0           47m
pod/url-shortener-d89884f96-bsl4k   1/1     Running   0           15h
pod/url-shortener-d89884f96-qvxb    1/1     Running   0           15h

NAME                                TYPE          CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
service/cche2redis                  ClusterIP      10.105.17.220 <none>        6379/TCP    47m
service/kubernetes                  ClusterIP      10.96.0.1    <none>        443/TCP     23h
service/url-shortener-svc           ClusterIP      10.104.8.238 <none>        1500/TCP    23h

NAME                                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/cche2redis           1/1     1             1           47m
deployment.apps/url-shortener        2/2     2             2           15h

NAME                                DESIRED   CURRENT   READY   AGE
replicaset.apps/cche2redis-767f4bc88b 1         1         1       47m
replicaset.apps/url-shortener-d89884f96 2         2         2       15h
(venv) PS D:\Classes\cloud\LinkShortener\step3>
```

```
(venv) PS D:\Classes\cloud\LinkShortener\step3> kubectl get pods
NAME                READY   STATUS    RESTARTS   AGE
alpinestep          1/1     Running   0           130m
alpinestep4         1/1     Running   0           53m
cchw2redis-767f4bc88b-xc9n6  1/1     Running   0           47m
url-shortener-d89884f96-bsl4k  1/1     Running   0           15h
url-shortener-d89884f96-qvxb  1/1     Running   0           15h
(venv) PS D:\Classes\cloud\LinkShortener\step3> kubectl get ip
error: the server doesn't have a resource type "ip"
(venv) PS D:\Classes\cloud\LinkShortener\step3> kubectl get ep
NAME                ENDPOINTS          AGE
cchw2redis          10.244.0.44:6379    9h
kubernetes          192.168.49.2:8443   32h
url-shortener-svc   10.244.0.37:8001,10.244.0.38:8001 32h
```

گام چهارم:

جواب سوال اول در گام سوم هم آمده بود که دوباره در عکس زیر قرار میدهم:

```
(venv) PS D:\Classes\cloud\LinkShortener\step3> kubectl get all
NAME                READY   STATUS    RESTARTS   AGE
pod/alpinestep      1/1     Running   0           130m
pod/alpinestep4     1/1     Running   0           52m
pod/cchw2redis-767f4bc88b-xc9n6  1/1     Running   0           47m
pod/url-shortener-d89884f96-bsl4k  1/1     Running   0           15h
pod/url-shortener-d89884f96-qvxb  1/1     Running   0           15h

NAME                TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)    AGE
service/cchw2redis   ClusterIP    10.105.17.228 <none>         6379/TCP    47m
service/kubernetes   ClusterIP    10.96.0.1    <none>         443/TCP     23h
service/url-shortener-svc  ClusterIP    10.104.8.238 <none>         1500/TCP    23h

NAME                READY   UP-TO-DATE   AVAILABLE   AGE
deployment.apps/cchw2redis  1/1     1             1           47m
deployment.apps/url-shortener  2/2     2             2           15h

NAME                DESIRED   CURRENT   READY   AGE
replicaset.apps/cchw2redis-767f4bc88b  1         1         1       47m
replicaset.apps/url-shortener-d89884f96  2         2         2       15h
```

اینجا میبینیم درخواست ها بین این دو توزیع شده است:

```
(venv) PS D:\Classes\cloud\LinkShortener\step3> kubectl logs url-shortener-d89884f96-bsl4k --tail=10
Long URL was https://docs.posit.co/connect/user/fastapi/, short URL is rebrand.ly/wjcttbm
INFO: 10.244.0.42:45828 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:54784 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:54826 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:42968 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:42970 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:42998 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55726 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55752 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK

NAME                READY   STATUS    RESTARTS   AGE
pod/alpinestep4     1/1     Running   0           52m
pod/cchw2redis-767f4bc88b-xc9n6  1/1     Running   0           47m
pod/url-shortener-d89884f96-bsl4k  1/1     Running   0           15h
pod/url-shortener-d89884f96-qvxb  1/1     Running   0           15h
```

```
(venv) PS D:\Classes\cloud\LinkShortener\step3\service\redis> kubectl logs url-shortener-d89884f96-qvxb --tail=10
INFO: 10.244.0.42:36202 - "POST / HTTP/1.1" 422 Unprocessable Entity
Long URL was https://docs.posit.co/connect/user/fastapi/, short URL is rebrand.ly/6nugk4x
INFO: 10.244.0.42:35960 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:54880 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:42982 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55690 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55704 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55718 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55736 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
INFO: 10.244.0.42:55758 - "POST /?url=https%3A%2F%2Fdocs.posit.co%2Fconnect%2Fuser%2Ffastapi%2F HTTP/1.1" 200 OK
(venv) PS D:\Classes\cloud\LinkShortener\step3\service\redis>
```