

نام و نام خانوادگی: حسنا اوپارحسینی	شماره دانشجویی: ۹۸۳۳۰۱۰
نام درس: رایانش ابری	شماره تمرین: تمرین شماره ۲

## (( گزارش تمرین دوم ))

### گام اول

- ارسال ایمیج ساخته شده بر روی داکر هاب و نتیجه آن:

```
→ CC-HW2 docker image tag hw2cc-1:1.0 hosnahoseini/hw2cc:1.0
→ CC-HW2 docker image push hosnahoseini/hw2cc:1.0
The push refers to repository [docker.io/hosnahoseini/hw2cc]
cbc5670ef91a: Pushed
f4462d5b2da2: Layer already exists
1.0: digest: sha256:211cee3b574f5fee73296b53279979f388d6d3ec79180cf1cbca10bf81cec598 size: 741
→ CC-HW2 docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
hosnahoseini/hw2cc	1.0	6db509d722c1	8 minutes ago	129MB
hw2cc-1	1.0	6db509d722c1	8 minutes ago	129MB

hosnahoseini > Repositories > hw2cc > Using 0 of 1 private repositories. [Get more](#)

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TAG	DIGEST	OS/ARCH	LAST PULL	COMPRESSED SIZE
1.0 Last pushed 4 minutes ago by <a href="#">hosnahoseini</a>	211cee3b574f	linux/amd64	---	60.43 MB

[docker pull hosnahoseini/hw2cc](#)

- نمایش لیست image ها و container های موجود بر روی سیستم:

```
→ CC-HW2 docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
47bd202fd440	hosnahoseini/hw2cc:1.0	"/bin/bash"	About a minute ago	Up About a minute		testhw2cc1

```
→ CC-HW2 docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
hosnahoseini/hw2cc	1.0	6db509d722c1	13 minutes ago	129MB

- دریافت ایمیج ساخته شده از داکر هاب:

```
→ CC-HW2 docker pull hosnahoseini/hw2cc:1.0
1.0: Pulling from hosnahoseini/hw2cc
Digest: sha256:211cee3b574f5fee73296b53279979f388d6d3ec79180cf1cbca10bf81cec598
Status: Downloaded newer image for hosnahoseini/hw2cc:1.0
docker.io/hosnahoseini/hw2cc:1.0
```

- ساختن کانتینر از ایمیج دریافت شده و اجرای دستور curl در آن:

```
→ CC-HW2 docker run -it --name testhw2cc1 hosnahoseini/hw2cc:1.0
root@47bd202fd440:/# curl www.google.com
<doctype html><html itemscope="" itemtype="http://schema.org/WebPage" lang="en-IR"><head><meta content="Search the world's information, inclu
ding webpages, images, videos and more. Google has many special features to help you find exactly what you're looking for." name="description"
><meta content="noodp" name="robots"><meta content="text/html; charset=UTF-8" http-equiv="Content-Type"><meta content="/images/branding/google
g/1x/googleg_standard_color_128dp.png" itemprop="image"><title>Google</title><script nonce="EyDWeryZ6dFoIAodf5vVDw">(function(){window.google=
{KEI: 'Id5QY9HgHbXp7_UPhNmNmAI', kEXPI: '0,1359409,6059,206,4804,2316,383,246,5,5367,1123753,1197702,699,380089,16115,28684,22430,1362,12320,1758
0,4997,13228,3847,10622,22741,2855,3819,1279,2743,148,562,541,840,1986,4311,108,4012,2023,2299,14668,3227,2845,7,24990,8227,553,1851,15756,3,5
76,1014,1,5445,148,11323,2652,4,1528,2304,24858,9912,7357,13658,4437,16786,5821,2536,4094,4052,3,3541,1,39042,2,3110,2,16737,4931,18093,5679,1
020,2381,22668,6073,4568,6256,23421,1252,5835,14968,4332,5016,2468,445,2,2,1,24626,2006,8155,7381,2,15968,873,19633,6,1923,5784,3995,19130,121
```

## گام دوم)

- دریافت ایميج ردیس و ساختن کانتینر از آن:

```
➔ ~ docker run -p 6377:6379 --name redistest redis:6.2-alpine
1:C 21 Dec 2022 07:20:35.469 # 000000000000 Redis is starting 000000000000
1:C 21 Dec 2022 07:20:35.469 # Redis version=6.2.8, bits=64, commit=00000000, modified=0, pid=1, just started
1:C 21 Dec 2022 07:20:35.469 # Warning: no config file specified, using the default config. In order to specify a config file use redis-server
/path/to/redis.conf
1:M 21 Dec 2022 07:20:35.470 * monotonic clock: POSIX clock_gettime
1:M 21 Dec 2022 07:20:35.470 * Running mode=standalone, port=6379.
1:M 21 Dec 2022 07:20:35.470 # Server initialized
1:M 21 Dec 2022 07:20:35.471 # WARNING Memory overcommit must be enabled! Without it, a background save or replication may fail under low memo
ry condition. Being disabled, it can also cause failures without low memory condition, see https://github.com/jemalloc/jemalloc/issues/132
8. To fix this issue add 'vm.overcommit_memory = 1' to /etc/sysctl.conf and then reboot or run the command 'sysctl vm.overcommit_memory=1' for
this to take effect.
1:M 21 Dec 2022 07:20:35.471 * Ready to accept connections
```

- ساختن شبکه و ولوم:

```
version: '3.8'
services:
  cache:
    container_name: redis-cache
    image: redis:6.2-alpine
    restart: always
    ports:
      - '6379:6379'
    command: redis-server --requirepass eYVX7EwVmmxKPCDmwMtyKVge8oLd2t81
    volumes:
      - cache:/data
    networks:
      - app-tier
```

در یافت ایميج  
ردیس و ساختن  
کانتینر از آن

```
web:
  container_name: api
  build: .
  ports:
    - 8008:8000
  depends_on:
    - cache
  links:
    - cache
  environment:
    REDIS_PASSWORD: eYVX7EwVmmxKPCDmwMtyKVge8oLd2t81
  networks:
    - app-tier
```

```
volumes:
  cache:
    driver: local
```

```
networks:
  app-tier:
    driver: bridge
```

ساختن volume جهت  
persistent کردن اطلاعات  
ساختن شبکه برای برقراری  
ارتباط بین دو کانتینر

- ساختن ایمیج سرور با استفاده از داکر فایل:

```
1 FROM python:3.9
2
3 WORKDIR /app
4
5 COPY requirements.txt ./
6
7 RUN pip install -r requirements.txt
8
9 COPY . .
10
11 CMD ["python", "/app/main.py"]
12
```

- ارسال ایمیج ساخته شده بر روی داکرهاب و نمایش نتیجه آن:

```
→ src docker build -t hw2cc:2.0
Sending build context to Docker daemon 11.78kB
Step 1/6 : FROM python:3.9
--> 81dbc1f514bf
Step 2/6 : WORKDIR /app
--> Using cache
--> d9fb5c60e3ed
Step 3/6 : COPY requirements.txt ./
--> Using cache
--> d34ac1f7c7a8
Step 4/6 : RUN pip install -r requirements.txt
--> Using cache
--> b6d287f8ce4e
Step 5/6 : COPY . .
--> Using cache
--> 8df7fcc88db8
Step 6/6 : CMD ["python", "/app/main.py"]
--> Using cache
--> 8203112ce59e
Successfully built 8203112ce59e
Successfully tagged hw2cc:2.0
→ src docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
src_web	latest	8203112ce59e	7 minutes ago	991MB
hw2cc	2.0	8203112ce59e	7 minutes ago	991MB

hosnaseini > Repositories > hw2cc > 2.1



hosnaseini/hw2cc:2.1

DIGEST: sha256:32a7da412707fcc83b9df8b158eddc1c1965cbecdba56096fef755b3227b5a0c

Delete Tag

OS/ARCH  
linux/amd64

COMPRESSED SIZE ⓘ  
365.7 MB

LAST PUSHED  
11 hours ago by [hosnaseini](#)

TYPE  
Image

Image Layers

Vulnerabilities

IMAGE LAYERS ⓘ

1 ADD file ... in /

52.45 MB

Command

2 CMD ["bash"]

0 B

ADD file:d0f758e50c654c225f6c7f03e8a579efc9106437051573bdbae5e63b1c4b2c1f in /

- نمایش اطلاعات ایمج سرور خود:

```
→ k8s docker inspect 8203112ce59e
[
  {
    "Id": "sha256:8203112ce59e94b61889e11ef3f022c970eaf7f8170b6dbfd09304b2683b4737",
    "RepoTags": [
      "hosnahoseini/hw2cc:2.0",
      "hw2cc:2.0",
      "src_web:latest"
    ],
    "RepoDigests": [],
    "Parent": "sha256:8df7fcc88db8247c9ec6306fba43924a40e6252947432abd3bf8fa4fb69645d8",
    "Comment": "",
    "Created": "2022-12-20T15:43:20.992724699Z",
    "Container": "d4bc4d1aa73aa822c65897c675a7e4c5c4ce040e66f79e47c7ffc02b431ed0ca",
    "ContainerConfig": {
      "Hostname": "d4bc4d1aa73a",
      "Domainname": "",
      "User": "",
      "AttachStdin": false,
      "AttachStdout": false,
      "AttachStderr": false,
      "Tty": false,
      "OpenStdin": false,
      "StdinOnce": false,
      "Env": [
        "PATH=/usr/local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin",
        "LANG=C.UTF-8",
        "GPG_KEY=E3FF2839C048B25C084DEBE9B26995E310250568",
        "PYTHON_VERSION=3.9.13",
        "PYTHON_PIP_VERSION=22.0.4",
        "PYTHON_SETUPTOOLS_VERSION=58.1.0",
        "PYTHON_GET_PIP_URL=https://github.com/pypa/get-pip/raw/5eaac1050023df1f5c98b173b248c260023f2278/public/get-pip.py",
        "PYTHON_GET_PIP_SHA256=5aefe6ade911d997af080b315ebcb7f882212d070465df544e1175ac2be519b4"
      ],
      "Cmd": [
        "/bin/sh",
        "-c",
        "#(nop) ",
        "CMD [\"python\" \"/app/main.py\"]"
      ],
      "Image": "sha256:8df7fcc88db8247c9ec6306fba43924a40e6252947432abd3bf8fa4fb69645d8",
      "Volumes": null,
      "WorkingDir": "/app",
      "Entrypoint": null,
      "OnBuild": null,
      "Labels": {}
    },
    "DockerVersion": "20.10.17",
    "Author": "",
    "Config": {
      "Hostname": "",
      "Domainname": "",
      "User": "",
      "AttachStdin": false,
      "AttachStdout": false,
      "AttachStderr": false,
      "Tty": false,
      "OpenStdin": false,
      "StdinOnce": false,
      "Env": [
        "PATH=/usr/local/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin",
        "LANG=C.UTF-8",
        "GPG_KEY=E3FF2839C048B25C084DEBE9B26995E310250568",
        "PYTHON_VERSION=3.9.13",
        "PYTHON_PIP_VERSION=22.0.4",
        "PYTHON_SETUPTOOLS_VERSION=58.1.0",
        "PYTHON_GET_PIP_URL=https://github.com/pypa/get-pip/raw/5eaac1050023df1f5c98b173b248c260023f2278/public/get-pip.py",
        "PYTHON_GET_PIP_SHA256=5aefe6ade911d997af080b315ebcb7f882212d070465df544e1175ac2be519b4"
      ],
      "Cmd": [
        "python",
        "/app/main.py"
      ],
      "Image": "sha256:8df7fcc88db8247c9ec6306fba43924a40e6252947432abd3bf8fa4fb69645d8",
      "Volumes": null,
      "WorkingDir": "/app",
      "Entrypoint": null,
      "OnBuild": null,
      "Labels": null
    },
    "Architecture": "amd64",
    "Os": "linux",
    "Size": 991308091,
    "VirtualSize": 991308091,
  }
]
```

```

"VirtualSize": 991308091,
"GraphDriver": {
  "Data": {
    "LowerDir": "/var/lib/docker/overlay2/442c4bc977337e46e312d8bfcfd9655b2771c5064b4088c744d32f7ee95e12f/diff:/var/lib/docker/overlay2/76f2a3353d62cf1bb7ffa4340065eb186bec1c4f9273358a0026816ad221a0ba/diff:/var/lib/docker/overlay2/364b9bfbef9008e714bda5b10d518af2c367eab1af81c4dcff1d72eff7e584e97/diff:/var/lib/docker/overlay2/ac12df8b9d7464642395c5285b46f7c4cf146469e0e883445fcd4dc0c23fbbdeb/diff:/var/lib/docker/overlay2/23ad199f428baea34d342228374afce539b32cfeec3d55a1baad68996abdb672/diff:/var/lib/docker/overlay2/8549f56336ac19cc2c6401b97a604a5e9094da5e35e85321af9028f8b1e1fe2/diff:/var/lib/docker/overlay2/b47e492f97710b02f11010061629e0f36c32bc493c2ede354b6ed934d1383597/diff:/var/lib/docker/overlay2/e45de9928c93bdb9b80b02dc374a5d8b09dd164ca48355f12fce4bds9df99343/diff:/var/lib/docker/overlay2/666a8f3a61f8306e18fcd1a33f5b192156fe19b435761510908d2a07d98b764/diff:/var/lib/docker/overlay2/e7c7aa4df73afde8ddcb9f79e51667952dfca41abac0e141ad4aa7a2fd45a93c7/diff:/var/lib/docker/overlay2/067582aeb9fe123c8f3b535e190fe2879919623c0fdcf31bda91bdd52f1cf33d/diff:/var/lib/docker/overlay2/2033366e98b2091c8955d1853de5e483e803ba3009d0390157340787f013411bb/diff",
    "MergedDir": "/var/lib/docker/overlay2/b40d601f7a5f238aba50138dbf0047a6a2aba69db3328664939c697a39756add/merged",
    "UpperDir": "/var/lib/docker/overlay2/b40d601f7a5f238aba50138dbf0047a6a2aba69db3328664939c697a39756add/diff",
    "WorkDir": "/var/lib/docker/overlay2/b40d601f7a5f238aba50138dbf0047a6a2aba69db3328664939c697a39756add/work"
  },
  "Name": "overlay2"
},
"RootFS": {
  "Type": "layers",
  "Layers": [
    "sha256:9c742cd6c7a5752ee36be8ecb14be45c0885e10e6dd34f26a9ae3eb096c5d492",
    "sha256:03127cd479b0f1eb8a9b0df8e8d72ead24979728d3c84ff645611b9d8790f94",
    "sha256:293d5b30c9cf33b65fa033e427fdd118464f9ea0c2a343a478a6e89c29140e",
    "sha256:9b55156abf262eac3e6bd3ae60e7277ab4f9c69543650d7cecf8c26ee889873",
    "sha256:12228ba7a3b10e8fee0f04e03ad106a596a2bee15bd41a3960ccc3d497206ab8",
    "sha256:2143381c9922b48e45dfc3e1aba28eefc82d66c0be32b0b6bc0b68f158d665",
    "sha256:be73944855a39b220b7234949468006d1b4c70219062f8da6f66bb694f4160dc",
    "sha256:e3e1e8ae0ad929c85323a612cf83b0803c503cd62d8aed9a3347584ff007a15e",
    "sha256:3889f2400c32ce07292ffdeef7bc8cd816c2418a4aca1533872878fe2b40d5d",
    "sha256:9772fb674bf7ba30e92af1d174a7101a338436b71234b00bd14b9ee1f18d9bbc",
    "sha256:d15bd4a909aefe615b57dbd38181db5f7af329d1ea91757d624d022c83fcafb",
    "sha256:d0609b095749e2d4d5aa20f8503a90c5c308efd465254a8025545d69bf20da3",
    "sha256:edc535c62d533b7dc2b202d157344a045e5ccf2f8397041f0bd301e25c51af4"
  ]
},
"Metadata": {
  "LastTagTime": "2022-12-20T19:21:26.779078526+03:30"
}
}

```

## • نمایش کانینر های موجود در سیستم:

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4941c2aeb831	src_web	"python /app/main.py"	14 minutes ago	Up 14 minutes	0.0.0.0:8008->8000/tcp, :::8008->8000/tcp	api
d9b1555139ac	redis:6.2-alpine	"docker-entrypoint.s..."	14 minutes ago	Up 14 minutes	0.0.0.0:6379->6379/tcp, :::6379->6379/tcp	redis-cache

## • نمایش میزان منابع استفاده شده:

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %	NET I/O	BLOCK I/O	PIDS
4941c2aeb831	api	0.37%	33.76MiB / 7.65GiB	0.43%	12.9kB / 0B	10.6MB / 123kB	1
d9b1555139ac	redis-cache	0.27%	3.008MiB / 7.65GiB	0.04%	14.4kB / 0B	6.93MB / 0B	5

## گام سوم)

- بررسی صحت ایجاد منابع با استفاده از دستورات `kubectl get`:

```
k8s k get pods
NAME                                READY   STATUS    RESTARTS   AGE
app-5b7b4ccf46-bzjgc               1/1    Running   0           32m
app-5b7b4ccf46-j9fh5               1/1    Running   0           32m
netutils-deployment-588cc9754f-8725p 1/1    Running   0           36m
redis-757f5bccc4-9h5s5             1/1    Running   0           8s
→ k8s k get pods
NAME                                READY   STATUS    RESTARTS   AGE
app-5b7b4ccf46-bzjgc               1/1    Running   0          142m
app-5b7b4ccf46-j9fh5               1/1    Running   0          142m
netutils-deployment-588cc9754f-8725p 1/1    Running   0          146m
redis-757f5bccc4-9h5s5             1/1    Running   0          110m
→ k8s k get configmap
NAME      DATA   AGE
app-config 1       24h
kube-root-ca.crt 1       4d12h
→ k8s k get persistentvolumeclaim
NAME      STATUS   VOLUME   CAPACITY   ACCESS MODES   STORAGECLASS   AGE
redis-pvc Bound    redis    100Mi      RWO           manual         125m
→ k8s k get persistentvolume
NAME      CAPACITY   ACCESS MODES   RECLAIM POLICY   STATUS   CLAIM                STORAGECLASS   REASON   AGE
redis     100Mi      RWO           Retain           Bound    default/redis-pvc    manual                127m
→ k8s k get deployment
NAME              READY   UP-TO-DATE   AVAILABLE   AGE
app               2/2     2             2           143m
netutils-deployment 1/1     1             1           147m
redis             1/1     1             1           3h37m
→ k8s k get svc
NAME              TYPE        CLUSTER-IP   EXTERNAL-IP   PORT(S)   AGE
app-service      ClusterIP   10.98.39.76   <none>        80/TCP    3h16m
kubernetes       ClusterIP   10.96.0.1     <none>        443/TCP   4d12h
redis-service    ClusterIP   10.106.138.234 <none>        6379/TCP  30h
→ k8s
```

- نمایش آدرس آی پی پادها:

```
→ k8s k get ep
NAME              ENDPOINTS                                     AGE
app-service      172.17.0.5:65432,172.17.0.6:65432          3h18m
kubernetes       192.168.49.2:8443                          4d12h
redis-service    172.17.0.9:6379                             30h
→ k8s
```

## گام چهارم)

- نمایش صحت ایجاد منابع: بخش ۱ گام قبل

- توزیع بار میان پاد ها:

- ارسال در خواست های مکرر

```
root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET' \
> 'http://app-service/crypto' \
> -H 'accept: application/json'
{"crypto name":"BTC","price":"16882.45136017394","description":"result from api"}root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET'
'http://app-service/crypto' -H 'accept: application/json'
{"crypto name":"BTC","price":"16882.45136017394","description":"result from redis"}root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET'
'http://app-service/crypto' -H 'accept: application/json'
{"crypto name":"BTC","price":"16882.45136017394","description":"result from redis"}root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET'
'http://app-service/crypto' -H 'accept: application/json'
{"crypto name":"BTC","price":"16882.45136017394","description":"result from redis"}root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET'
'http://app-service/crypto' -H 'accept: application/json'
{"crypto name":"BTC","price":"16882.45136017394","description":"result from redis"}root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET'
'http://app-service/crypto' -H 'accept: application/json'
{"crypto name":"BTC","price":"16882.45136017394","description":"result from redis"}root@netutils-deployment-588cc9754f-8725p:/# curl -X 'GET'
'http://app-service/crypto' -H 'accept: application/json'
{"crypto name":"BTC","price":"16886.208237354625","description":"result from api"}root@netutils-deployment-588cc9754f-8725p:/#
```

- مشاهده لاگ دو پاد که مشاهده میکنیم در خواست هایی به هر دو وجود دارد پس یعنی درخواست

ها بین پاد ها توزیع شده اند.

```
→ k8s k get pods
NAME                                READY   STATUS    RESTARTS   AGE
app-6f4768ff9c-4vjbg               1/1     Running   0           9m36s
app-6f4768ff9c-qpr94               1/1     Running   0           4m4s
netutils-deployment-588cc9754f-8725p 1/1     Running   0           159m
redis-757f5bccc4-9h5s5             1/1     Running   0           123m
→ k8s k logs app-6f4768ff9c-4vjbg
INFO: Started server process [1]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: Uvicorn running on http://0.0.0.0:65432 (Press CTRL+C to quit)
INFO: 172.17.0.1:19152 - "GET /crypto HTTP/1.1" 200 OK
INFO: 172.17.0.1:8722 - "GET /crypto HTTP/1.1" 200 OK
→ k8s k logs app-6f4768ff9c-qpr94
INFO: Started server process [1]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: Uvicorn running on http://0.0.0.0:65432 (Press CTRL+C to quit)
INFO: 172.17.0.1:22727 - "GET /crypto HTTP/1.1" 200 OK
INFO: 172.17.0.1:3396 - "GET /crypto HTTP/1.1" 200 OK
INFO: 172.17.0.1:13812 - "GET /crypto HTTP/1.1" 200 OK
INFO: 172.17.0.1:39697 - "GET /crypto HTTP/1.1" 200 OK
→ k8s
```