

CLOUD COMPUTING LAB – UE20CS351

Experiment 2 - Docker on Linux/Windows/Mac OS

SRN: PES2UG20CS045

NAME: ANANYA NARAYAN BHAT

1a.jpg: Screenshot of running docker hello-world.

```
C:\Users\anany\PES2UG20CS045>docker run hello-world

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/
```

2a.jpg: Screenshot of C Program successfully run inside the container.

```
C:\Users\anany\PES2UG20CS045\task2>docker run task2
Running this inside a container !
My SRN is PES2UG20CS045
```

2b.jpg: Screenshot of the image pushed to Dockerhub.

[Explore](#) [ananya045/task2](#) [1.0](#)



ananya045/task2:1.0

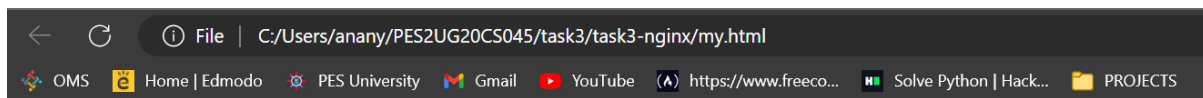
DIGEST: sha256: cab478d60074483308b42eb281c5ed47959b249742452a656f90d3d8964d1ba1

OS/ARCH	COMPRESSED SIZE ⓘ	LAST PUSHED	TYPE
linux/amd64	94.32 MB	4 minutes ago by ananya045	Image

3a.jpg: Screenshot of docker container running nginx

```
C:\Users\anany\PES2UG20CS045\task3\task3-nginx>docker run -p 80:80 task3
/docker-entrypoint.sh: /docker-entrypoint.d/ is not empty, will attempt to perform configuration
/docker-entrypoint.sh: Looking for shell scripts in /docker-entrypoint.d/
/docker-entrypoint.sh: Launching /docker-entrypoint.d/10-listen-on-ipv6-by-default.sh
10-listen-on-ipv6-by-default.sh: info: Getting the checksum of /etc/nginx/conf.d/default.conf
10-listen-on-ipv6-by-default.sh: info: Enabled listen on IPv6 in /etc/nginx/conf.d/default.conf
/docker-entrypoint.sh: Launching /docker-entrypoint.d/20-envsubst-on-templates.sh
/docker-entrypoint.sh: Launching /docker-entrypoint.d/30-tune-worker-processes.sh
/docker-entrypoint.sh: Configuration complete; ready for start up2023/03/05 13:02:30 [notice] 1#1: using the "epoll" event method
2023/03/05 13:02:30 [notice] 1#1: nginx/1.23.3
2023/03/05 13:02:30 [notice] 1#1: built by gcc 10.2.1 202110110 (Debian 10.2.1-6)
2023/03/05 13:02:30 [notice] 1#1: OS: Linux 5.10.16.3-microsoft-standard-WSL2
2023/03/05 13:02:30 [notice] 1#1: getrlimit(RLIMIT_NOFILE): 1048576:1048576
2023/03/05 13:02:30 [notice] 1#1: start worker processes
2023/03/05 13:02:30 [notice] 1#1: start worker process 29
2023/03/05 13:02:30 [notice] 1#1: start worker process 30
2023/03/05 13:02:30 [notice] 1#1: start worker process 31
2023/03/05 13:02:30 [notice] 1#1: start worker process 32
2023/03/05 13:02:30 [notice] 1#1: start worker process 33
2023/03/05 13:02:30 [notice] 1#1: start worker process 34
2023/03/05 13:02:30 [notice] 1#1: start worker process 35
2023/03/05 13:02:30 [notice] 1#1: start worker process 36
2023/03/05 13:02:30 [notice] 1#1: start worker process 37
2023/03/05 13:02:30 [notice] 1#1: start worker process 38
2023/03/05 13:02:30 [notice] 1#1: start worker process 39
2023/03/05 13:02:30 [notice] 1#1: start worker process 40
```

3b.jpg: Sample.html showing the web page on the browser.



MY SRN IS PES2UG20CS045

I am running a nginx container!

3c.jpg: Screenshot of python application successfully writing and reading from the MongoDB database

```
C:\Users\anany\PES2UG20CS045\task3\task3-pymongo>docker run task3
Inserted into the MongoDB database!
Fetched from MongoDB: {'_id': ObjectId('6404990342904db850e472b3'), 'Name': 'ANANYA', 'SRN': 'PES2UG20CS045'}
```

3d.jpg: Screenshot showing mongodb being run within the network

```
C:\Users\anany\PES2UG20CS045\task3\task3-pymongo>docker ps -a
```

CONTAINER ID	IMAGE	NAMES	COMMAND	CREATED	STATUS	PORTS
b0f270cd4613	mongo:latest		"docker-entrypoint.s..."	17 seconds ago	Up 14 seconds	0.0.0.
0:27017->27017/tcp	mongo:latest	mongod				
74b209909989	task3		"python sample.py"	2 minutes ago	Exited (0) 2 minutes ago	
14c91110b30d	mongo	vibrant_poincare	"docker-entrypoint.s..."	23 minutes ago	Exited (0) About a minute ago	
c2c8db1ee71f	554deab6fd9	funny_allen	"docker-entrypoint.s..."	29 minutes ago	Up 28 minutes	0.0.0.
0:80->80/tcp	e6c0e33c749f	musings_ardinghelli				
e6c0e33c749f	task2	charming_torvalds	". /a.out"	2 hours ago	Exited (0) 2 hours ago	
ce4b5128cc95	2b969449b3d9	quizzical_davinci	". /a.out"	2 hours ago	Exited (0) 2 hours ago	
cb738aa020d8	2b969449b3d9	festive_brattain	". /a.out"	2 hours ago	Exited (0) 2 hours ago	
416181ee200d	hello-world	epic_gates	"/hello"	3 hours ago	Exited (0) 3 hours ago	
f87bb3685380	hello-world	agitated_meninsky	"/hello"	5 hours ago	Exited (0) 5 hours ago	
863bbda8c2d2	gcr.io/k8s-minikube/kicbase:v0.0.37	minikube	"/usr/local/bin/entr..."	7 days ago	Exited (130) 7 days ago	
6c2c5a395857	hello-world	distracted_merkle	"/hello"	7 days ago	Exited (0) 7 days ago	
f76b737201c0	docker/getting-started	magical_visvesvaraya	"docker-entrypoint.s..."	7 days ago	Exited (255) 7 hours ago	0.0.0.

3e.jpg: Screenshot showing python file being run within the network and successfully writing and reading from MongoDB

```
C:\Users\anany\PES2UG20CS045\task3\task3-pymongo>docker build -t task3 .
[+] Building 0.3s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 31B
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load metadata for docker.io/library/python:latest
=> [1/4] FROM docker.io/library/python
=> [internal] load build context
=> => transferring context: 442B
=> CACHED [2/4] RUN apt-get update
=> CACHED [3/4] RUN pip install pymongo
=> [4/4] COPY sample.py sample.py
=> exporting to image
=> => exporting layers
=> => writing image sha256:dbea25cf02b8cadde4446844437f0a21359490cfb436c371aefb5978bad74b96
=> => naming to docker.io/library/task3

Use 'docker scan' to run Snyk tests against images to find vulnerabilities and learn how to fix them

C:\Users\anany\PES2UG20CS045\task3\task3-pymongo>docker run --network=my-bridge-network task3
Inserted into the MongoDB database!
Fetched from MongoDB: {'_id': ObjectId('64049a1d0afbd2524c9a5549'), 'Name': 'ANANYA', 'SRN': 'PES2UG20CS045'}
```

4a.jpg: Screenshot of python-mongodb application running as a docker-compose application

```
C:\Users\anany\PES2UG20CS045\task4>docker-compose up
[*] Building 0.5s (9/9) FINISHED
=> [internal] load build definition from Dockerfile                                0.1s
=> => transferring dockerfile: 150B                                             0.0s
=> [internal] load .dockerignore                                                0.1s
=> => transferring context: 2B                                                  0.0s
=> [internal] load metadata for docker.io/library/python:latest                0.0s
=> [1/4] FROM docker.io/library/python                                         0.0s
=> [internal] load build context                                                0.0s
=> => transferring context: 442B                                                0.0s
=> CACHED [2/4] RUN apt-get update                                             0.0s
=> CACHED [3/4] RUN pip install pymongo                                       0.0s
=> [4/4] COPY sample.py sample.py                                             0.1s
=> exporting to image                                                           0.1s
=> => exporting layers                                                           0.1s
=> => writing image sha256:15829bf6347bce49ec76859950f34f7f74051a9df0772d5f034a39bd9ef2ba25 0.0s
=> => naming to docker.io/library/task4-pycode                                0.0s
[*] Running 3/3
- Network task4_default Created                                               0.9s
- Container task4-mongodb-1 Created                                           0.2s
- Container task4-pycode-1 Created                                           0.2s
Attaching to task4-mongodb-1, task4-pycode-1
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:55.412+00:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"main","msg":"Automatically dis
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:55.414+00:00"},"s":"I", "c":"NETWORK", "id":4915701, "ctx":"main","msg":"Initialized wire
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:55.418+00:00"},"s":"I", "c":"NETWORK", "id":4648601, "ctx":"main","msg":"Implicit TCP Fast
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:55.450+00:00"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully regi
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:55.451+00:00"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully regi
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:55.451+00:00"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully regi
```

```
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:56.995+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener","msg":"Connection acc
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:56.999+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn1","msg":"client metadata",
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.005+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener","msg":"Connection acc
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.005+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn2","msg":"client metadata",
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.006+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener","msg":"Connection acc
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.008+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn3","msg":"client metadata",
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.011+00:00"},"s":"I", "c":"STORAGE", "id":20320, "ctx":"conn3","msg":"createCollection",
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.034+00:00"},"s":"I", "c":"INDEX", "id":20345, "ctx":"conn3","msg":"Index build: done
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.506+00:00"},"s":"I", "c":"-", "id":20883, "ctx":"conn1","msg":"Interrupted opera
task4-pycode-1 | {"t":{"$date":"2023-03-05T13:37:57.512+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn1","msg":"Connection ended",
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.520+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn3","msg":"Connection ended",
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:37:57.520+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn2","msg":"Connection ended",
task4-pycode-1 exited with code 0
```

4b.jpg: Screenshot of 3 python application writes and reads from MongoDB after scaling the python application.

```
C:\Users\anany\PES2UG20CS045\task4>docker-compose up --scale pycode=3
[*] Running 4/4
- Container task4-mongodb-1 Created                                           0.0s
- Container task4-pycode-3 Created                                           0.2s
- Container task4-pycode-2 Created                                           0.2s
- Container task4-pycode-1 Recreated                                         0.2s
Attaching to task4-mongodb-1, task4-pycode-1, task4-pycode-2, task4-pycode-3
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.700+00:00"},"s":"I", "c":"CONTROL", "id":23285, "ctx":"-", "msg":"Automatically disabli
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.706+00:00"},"s":"I", "c":"NETWORK", "id":4915701, "ctx":"-", "msg":"Initialized wire spec
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.741+00:00"},"s":"I", "c":"NETWORK", "id":4648601, "ctx":"main","msg":"Implicit TCP FastO
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.778+00:00"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully regi
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.779+00:00"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully regi
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.779+00:00"},"s":"I", "c":"REPL", "id":5123008, "ctx":"main","msg":"Successfully regi
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.780+00:00"},"s":"I", "c":"CONTROL", "id":5945603, "ctx":"main","msg":"Multi threading in
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.782+00:00"},"s":"I", "c":"CONTROL", "id":4615611, "ctx":"initandlisten","msg":"MongoDB s
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.791+00:00"},"s":"I", "c":"CONTROL", "id":23403, "ctx":"initandlisten","msg":"Build Inf
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:08.791+00:00"},"s":"I", "c":"CONTROL", "id":23403, "ctx":"initandlisten","msg":"Build Inf
modules: [], allocator: "tcmalloc", environment: {"distmod":"ubuntu2204", "distarch":"x86_64", "target_arch":"x86_64"}}}
```

```
task4-pycode-2 exited with code 0
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.397+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener", "msg":"Connection accepted", "attr":{"remote":"172.19.0.5:36976", "uuiid":"29054f75-4a45-4605-bc6d-6335a3816118", "connectionId":7, "connectionCount":1}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.397+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn7", "msg":"client metadata", "attr":{"remote":"172.19.0.5:36976", "client":"conn7", "doc":{"driver":{"name":"PyMongo", "version":"4.3.3"}, "os":{"type":"Linux", "name":"Linux", "architecture":"x86_64", "version":"5.10.16.3-microsoft-standard-WSL2"}, "platform":"CPython 3.11.2.final.0"}}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.400+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener", "msg":"Connection accepted", "attr":{"remote":"172.19.0.5:36978", "uuiid":"00349cab-285b-4e76-b910-b5bdccdb3fb7", "connectionId":8, "connectionCount":2}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.401+00:00"},"s":"I", "c":"NETWORK", "id":22943, "ctx":"listener", "msg":"Connection accepted", "attr":{"remote":"172.19.0.5:36980", "uuiid":"089da909-4960-47f5-becd-de0f67e2d6f1", "connectionId":9, "connectionCount":3}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.401+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn8", "msg":"client metadata", "attr":{"remote":"172.19.0.5:36978", "client":"conn8", "doc":{"driver":{"name":"PyMongo", "version":"4.3.3"}, "os":{"type":"Linux", "name":"Linux", "architecture":"x86_64", "version":"5.10.16.3-microsoft-standard-WSL2"}, "platform":"CPython 3.11.2.final.0"}}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.401+00:00"},"s":"I", "c":"NETWORK", "id":51800, "ctx":"conn9", "msg":"client metadata", "attr":{"remote":"172.19.0.5:36980", "client":"conn9", "doc":{"driver":{"name":"PyMongo", "version":"4.3.3"}, "os":{"type":"Linux", "name":"Linux", "architecture":"x86_64", "version":"5.10.16.3-microsoft-standard-WSL2"}, "platform":"CPython 3.11.2.final.0"}}}
task4-pycode-3 | Inserted into the MongoDB database!
task4-pycode-3 | Fetched from MongoDB: {'_id': ObjectId('64049b34f9bfeb0385e7ed9'), 'Name': 'ANANYA', 'SRN': 'PES2UG20CS045'}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.901+00:00"},"s":"I", "c":"-", "id":20883, "ctx":"conn7", "msg":"Interrupted operation as its client disconnected", "attr":{"opId":57}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.902+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn7", "msg":"Connection ended", "attr":{"remote":"172.19.0.5:36976", "uuiid":"29054f75-4a45-4605-bc6d-6335a3816118", "connectionId":7, "connectionCount":2}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.910+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn9", "msg":"Connection ended", "attr":{"remote":"172.19.0.5:36980", "uuiid":"089da909-4960-47f5-becd-de0f67e2d6f1", "connectionId":9, "connectionCount":1}}
task4-mongodb-1 | {"t":{"$date":"2023-03-05T13:40:13.910+00:00"},"s":"I", "c":"NETWORK", "id":22944, "ctx":"conn8", "msg":"Connection ended", "attr":{"remote":"172.19.0.5:36978", "uuiid":"00349cab-285b-4e76-b910-b5bdccdb3fb7", "connectionId":8, "connectionCount":0}}
task4-pycode-3 exited with code 0
```