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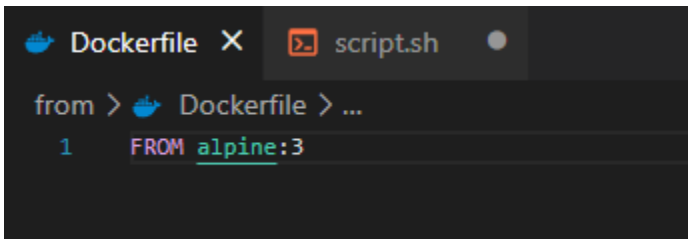
Tugas Dockerfile

Sistem Terdistribusi A

1. FROM instruction



2. Docker Build

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/from from
[+] Building 18.8s (6/6) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 50B
 => [internal] load metadata for docker.io/library/alpine:3
 => [auth] library/alpine:pull token for registry-1.docker.io
 => [internal] load .dockerignore
 => => transferring context: 2B
 => [1/1] FROM docker.io/library/alpine:3@sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d
 => => resolve docker.io/library/alpine:3@sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d
 => => sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d 1.85kB / 1.85kB
 => => sha256:33735bd63cf84d7e388d9f6d297d348c523c044410f553bd878c6d7829612735 528B / 528B
 => => sha256:91ef0af61f39ece4d6710e465df5ed6ca12112358344fd51ae6a3b886634148b 1.47kB / 1.47kB
 => exporting to image
 => => exporting layers
 => => writing image sha256:e75ff1d806b99c41ff0f797f6800a85546d5ebf447d69796ec1db166809a41a2
 => => naming to docker.io/roymunduss/from

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/hma10va39pzrrfba8h9vr498t
```

Perintah ini membangun sebuah image Docker dari direktori yang berisi file Dockerfile dengan instruksi FROM, dan memberi tag roymunduss/from pada image tersebut.

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker image ls
REPOSITORY                TAG       IMAGE ID       CREATED         SIZE
getting-started           latest    c45e3d174ab7   2 weeks ago     471MB
mongo                     latest    4d441da0b855   3 weeks ago     861MB
roymunduss/from           latest    e75ff1d806b9   5 weeks ago     7.8MB
ubuntu                    latest    b1e9cef3f297   7 weeks ago     78.1MB
nginx                     latest    9527c0f683c3   2 months ago    188MB
redis                     latest    7e49ed81b42b   2 months ago    117MB
mongo-express             latest    870141b735e7   7 months ago    182MB
docker/getting-started    latest    3e4394f6b72f   22 months ago   47MB
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Melihat docker image yang ada

3. Run Instruction

```
run > Dockerfile > ...
1   FROM alpine:3
2
3   RUN mkdir hello
4   RUN echo "Hello World" > "hello/world.txt"
5   RUN cat "hello/world.txt"
```

4. Docker Build

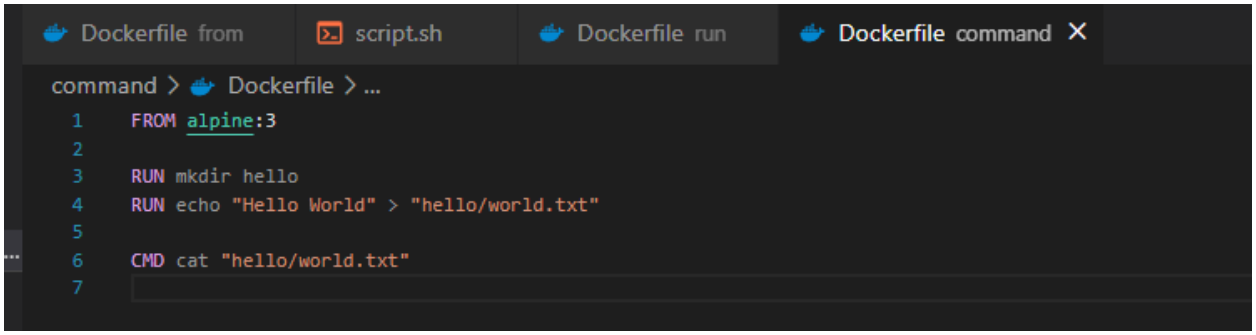
```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymundus/run run
[+] Building 4.7s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 140B
 => [internal] load metadata for docker.io/library/alpine:3
 => [auth] library/alpine:pull token for registry-1.docker.io
 => [internal] load .dockerignore
 => => transferring context: 2B
 => CACHED [1/4] FROM docker.io/library/alpine:3@sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d
 => [2/4] RUN mkdir hello
 => [3/4] RUN echo "Hello World" > "hello/world.txt"
 => [4/4] RUN cat "hello/world.txt"
 => exporting to image
 => => exporting layers
 => => writing image sha256:1f582c642cbe807681a3ce2f08bb60f4bd91ffebfd5a9e9485e9652d893474f3
 => => naming to docker.io/roymundus/run

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/6q74nx1m9qtr4y416unlyn6ex
```

Membangun image Docker berdasarkan instruksi di file Dockerfile yang menggunakan RUN untuk menjalankan perintah pada saat build.

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymundus/run run --progress=plain --no-cache
#0 building with "desktop-linux" instance using docker driver

#1 [internal] load build definition from Dockerfile
#1 transferring dockerfile: 140B 0.0s done
#1 DONE 0.0s

#2 [internal] load metadata for docker.io/library/alpine:3
#2 DONE 3.3s

#3 [internal] load .dockerignore
#3 transferring context: 2B done
#3 DONE 0.0s

#4 [1/4] FROM docker.io/library/alpine:3@sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d
#4 CACHED

#5 [2/4] RUN mkdir hello
#5 DONE 0.4s

#6 [3/4] RUN echo "Hello World" > "hello/world.txt"
#6 DONE 0.5s

#7 [4/4] RUN cat "hello/world.txt"
#7 0.406 Hello World
#7 DONE 0.4s

#8 exporting to image
#8 exporting layers 0.1s done
#8 writing image sha256:c009f86465e534ba096da74c36441c881415e49f2e06c38d95bf5a9252f9a4d3 done
#8 naming to docker.io/roymundus/run done
#8 DONE 0.1s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/uflklc4yj8rk56ac8ta47z7td
```

Membangun image Docker yang sama seperti di atas, tetapi tanpa menggunakan cache (--no-cache) dan menampilkan progress build dengan lebih detail (--progress=plain).

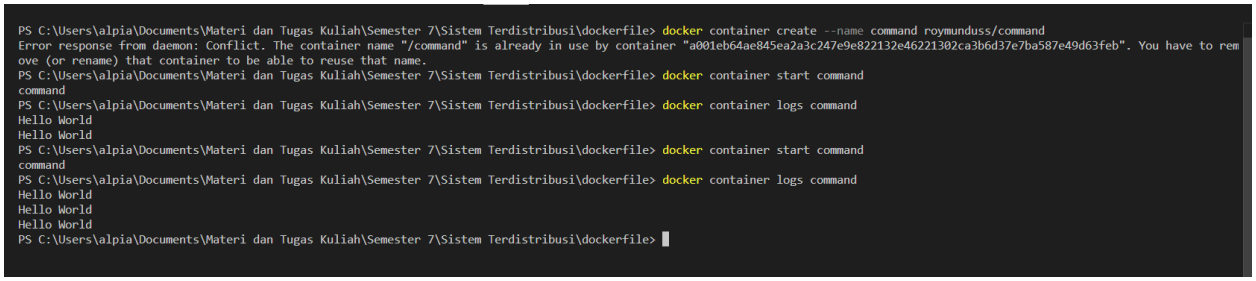
5. Command Instruction



6. Docker Build

Membangun image Docker dari instruksi CMD, yang menentukan perintah default yang akan dijalankan saat container dibuat dari image ini.

7. Docker Container



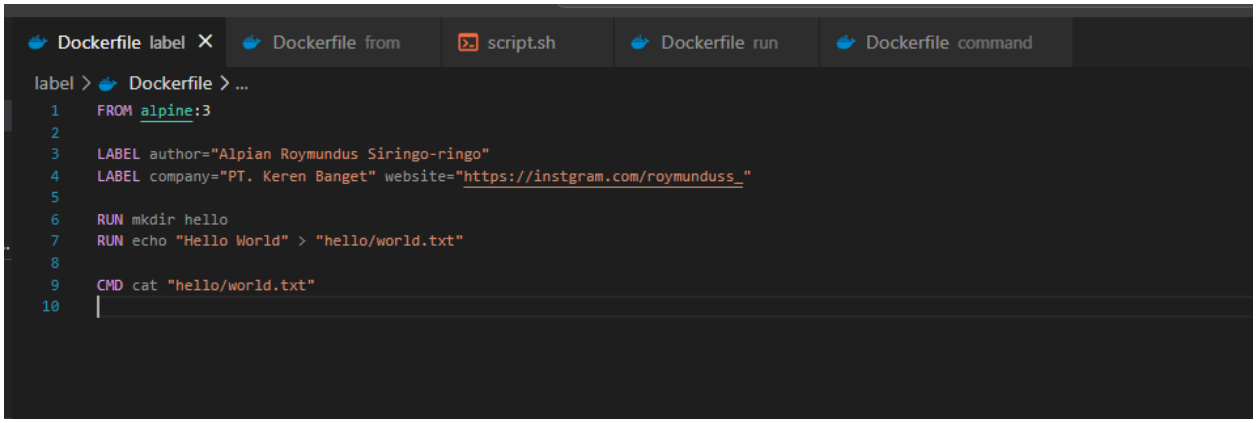
docker image inspect roymunduss/command: Menampilkan detail metadata dari image roymunduss/command.

docker container create --name command roymunduss/command: Membuat container baru bernama command dari image roymunduss/command.

docker container start command: Menjalankan container command.

docker container logs command: Menampilkan output log dari container command.

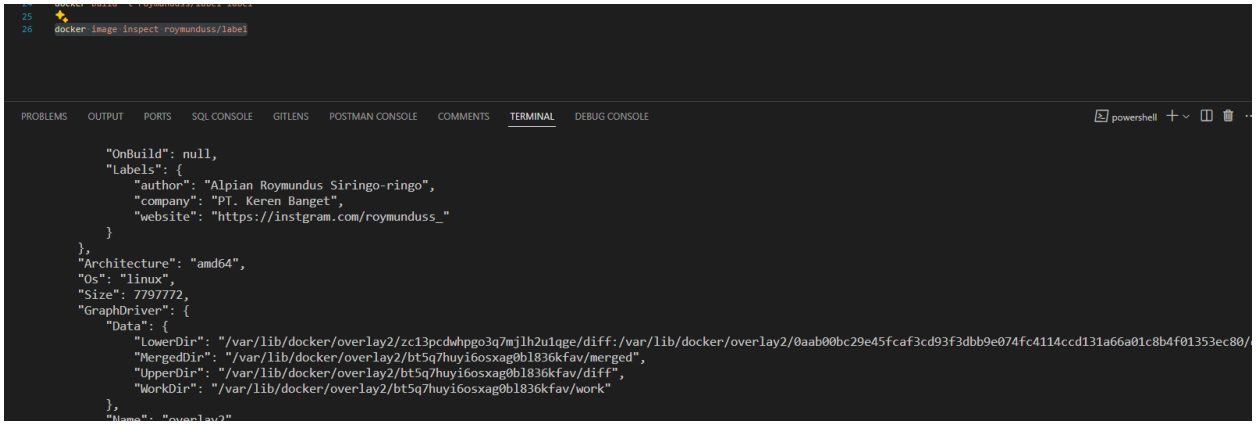
8. LABEL Instruction



9. Docker Build

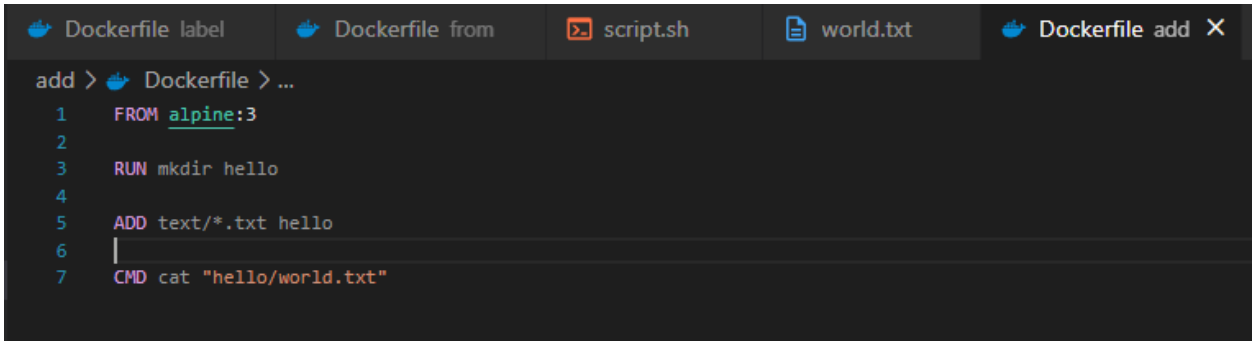
Membangun image Docker dengan menggunakan LABEL untuk menambahkan metadata pada image.

10. Inspect Docker Image



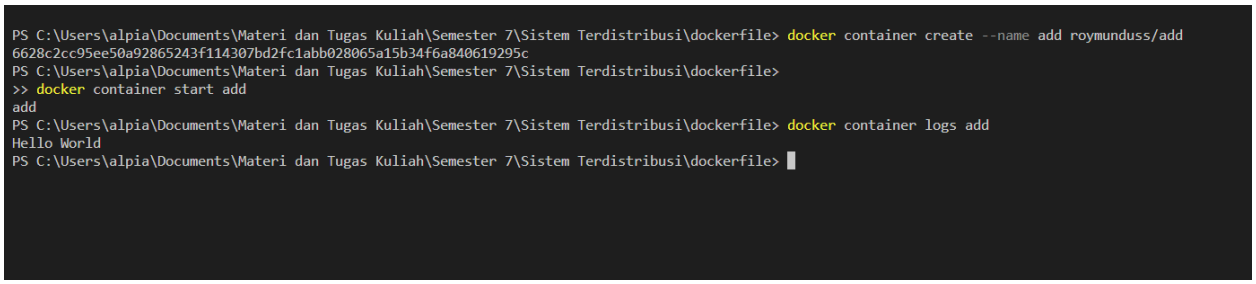
Menampilkan detail metadata dari image roymunduss/label.

11. ADD Instruction



12. Docker Build

Membangun image Docker dengan menggunakan instruksi ADD untuk menambahkan file atau direktori dari host ke image.



Membuat container bernama add dari image roymunduss/add.

docker container start add: Menjalankan container add.

docker container logs add: Menampilkan log dari container add.

13. COPY Instruction

```
copy > Dockerfile > ...
1   FROM alpine:3
2
3   RUN mkdir hello
4
5   COPY text/*.txt hello
6
7   CMD cat "hello/world.txt"
```

14. Docker Build

```
   3 |     RUN mkdir hello
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/copy copy
[+] Building 2.6s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 124B
 => [internal] load metadata for docker.io/library/alpine:3
 => [auth] library/alpine:pull token for registry-1.docker.io
 => [internal] load .dockerignore
 => => transferring context: 2B
 => [1/3] FROM docker.io/library/alpine:3@sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d
 => [internal] load build context
 => => transferring context: 153B
 => CACHED [2/3] RUN mkdir hello
 => [3/3] COPY text/*.txt hello
 => exporting to image
 => => exporting layers
 => => writing image sha256:89fe45c3d7231ac0c510acaf224fe2e4e6f1bbdc08545055df22d140b6e19cf5
 => => naming to docker.io/roymunduss/copy

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/0ui7647ido86tu1n7rm2n0ju5
```

Membangun image Docker menggunakan instruksi COPY untuk menyalin file dari host ke image Docker.

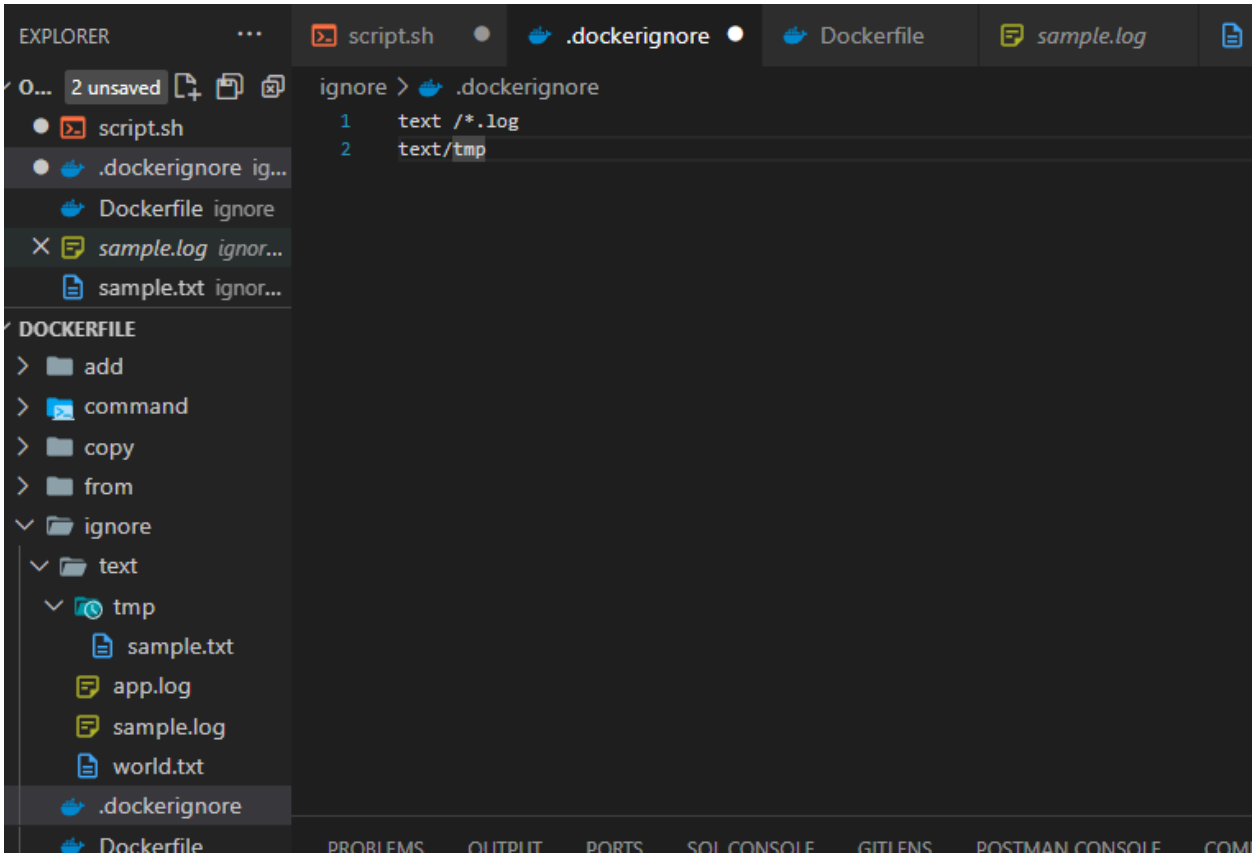
```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name copy roymunduss/copy
1971f430c2410601e3cbe52c41ddbca867f5357f6b11eca4cda1facfe34b34df
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start copy
copy
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container logs copy
Alpian Roymundus Siringoringo
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Membuat container bernama copy dari image roymunduss/copy.

docker container start copy: Menjalankan container copy.

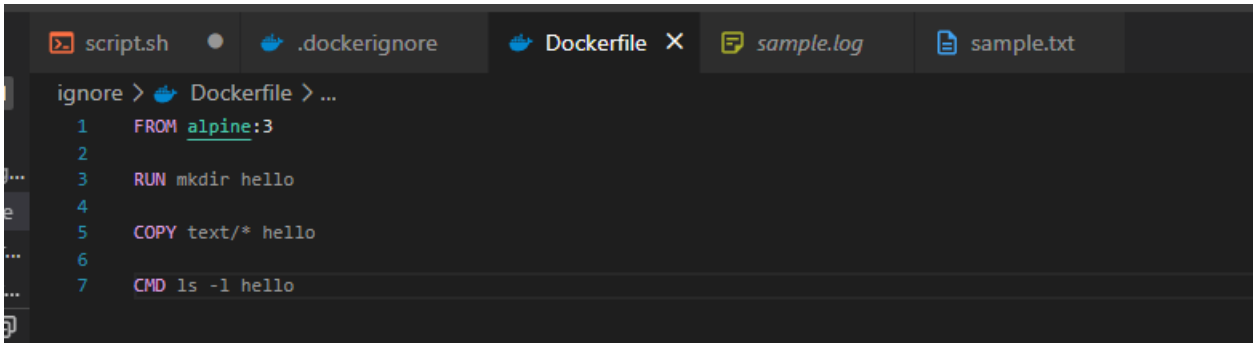
docker container logs copy: Menampilkan log dari container copy.

15. Dockerignore File



Membuat struktur file

16. Dockerfile



17. Docker Build

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/ignore ignore
[+] Building 3.1s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 110B
 => [internal] load metadata for docker.io/library/alpine:3
 => [auth] library/alpine:pull token for registry-1.docker.io
 => [internal] load .dockerignore
 => => transferring context: 34B
 => [1/3] FROM docker.io/library/alpine:3@sha256:beefdbd8a1da6d2915566fde36db9db0b524eb737fc57cd1367effd16dc0d06d
 => [internal] load build context
 => => transferring
 => CACHED [2/3] RUN
 => [3/3] COPY text/
 => exporting to image
 => => exporting layers
 => => writing image sha256:d3973b719ca94ee79f79330f953c6201759df22f1484e496fbca13ae01c6c48f
 => => naming to docker.io/roymunduss/ignore

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/xiw8s4ough7n9m1qjmu89gfq8
```

docker-desktop://dashboard/build/desktop-linux/desktop-linux/xiw8s4ough7n9m1qjmu89gfq8 (ctrl + click)

Membangun image Docker dengan menggunakan file .dockerignore untuk mengabaikan file tertentu saat membangun image.

18. Docker Container Logs

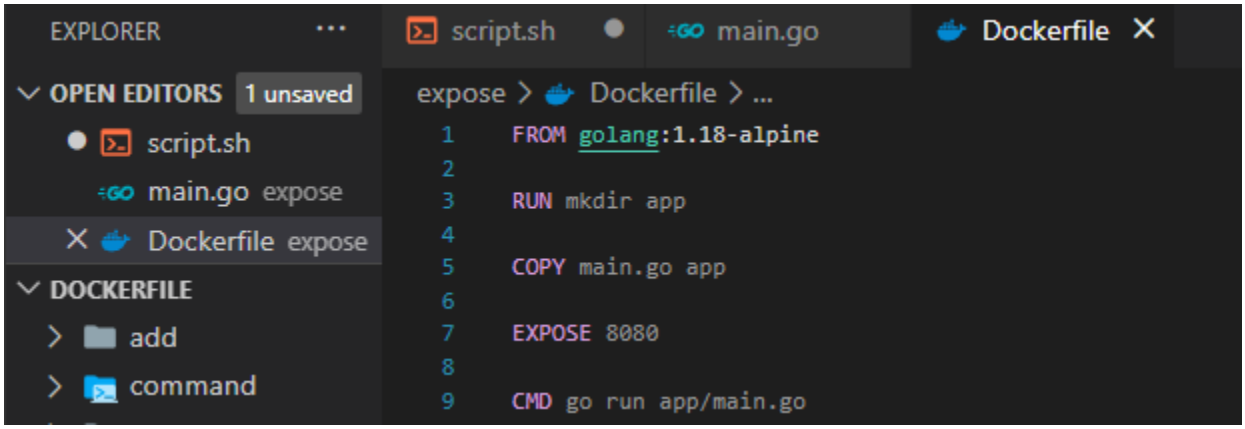
```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name ignore roymunduss/ignore
>>
c5e901ebd4bc5b6ca218e26e62ac0c442337132ccfcde9fa828fa049d072e583
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start ignore
>>
ignore
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container logs ignore
total 8
-rwxr-xr-x    1 root     root             0 Oct 18 04:50 app.log
-rwxr-xr-x    1 root     root            19 Oct 18 04:52 sample.log
-rwxr-xr-x    1 root     root            13 Oct 18 04:51 world.txt
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Docker container create --name ignore roymunduss/ignore: Membuat container bernama ignore dari image roymunduss/ignore.

docker container start ignore: Menjalankan container ignore.

docker container logs ignore: Menampilkan log dari container ignore.

19. Expose Instruction



20. Docker Build

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/expose expose
[+] Building 558.5s (9/9) FINISHED
 => [internal] load build definition from Dockerfile
 => => transferring dockerfile: 142B
 => [internal] load metadata for docker.io/library/golang:1.18-alpine
 => [auth] library/golang:pull token for registry-1.docker.io
 => [internal] load .dockerignore
 => => transferring context: 2B
 => [1/3] FROM docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807
 => => resolve docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807
 => => sha256:8921db27df2831fa6eaa85321205a2470c669b855f3ec95d5a3c2b46de0442c9 3.37MB / 3.37MB
 => => sha256:a2f8637abd914a8a62416e027a351293d0472bc4b4f44383c6f425fd0e03861c 284.81kB / 284.81kB
 => => sha256:4ba80a8cd2c7b1695ffb2166c58c8d0f0d4562c943fdb929d22467df250536bb 115.40MB / 115.40MB
 => => sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807 1.65kB / 1.65kB
 => => sha256:ab5685692564e027aa84e2980855775b2e48f8fc82c1590c0e1e8cbc2e716542 1.16kB / 1.16kB
 => => sha256:a77f45e5f987fb7def8755903ad89fe37a38105dcf475be26550d7d86364e166 5.01kB / 5.01kB
 => => sha256:dbc2308a458705184f3d2a5000ced1c12609903c00c09a9cf01284764b57315b 155B / 155B
 => => extracting sha256:8921db27df2831fa6eaa85321205a2470c669b855f3ec95d5a3c2b46de0442c9
 => => extracting sha256:a2f8637abd914a8a62416e027a351293d0472bc4b4f44383c6f425fd0e03861c
 => => extracting sha256:4ba80a8cd2c7b1695ffb2166c58c8d0f0d4562c943fdb929d22467df250536bb
 => => extracting sha256:dbc2308a458705184f3d2a5000ced1c12609903c00c09a9cf01284764b57315b
```

Membangun image yang menggunakan instruksi EXPOSE untuk mendeklarasikan port yang digunakan oleh container.

21. Docker Image Inspect

```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  GITLENS  POSTMAN CONSOLE  COMMENTS  TERMINAL  DEBUG CONSOLE

            "Domainname": "",
            "User": "",
            "AttachStdin": false,
            "AttachStdout": false,
            "AttachStderr": false,
            "ExposedPorts": {
                "8080/tcp": {}
            },
            "Tty": false,
            "OpenStdin": false,
            "StdinOnce": false,
            "Env": [
                "PATH=/go/bin:/usr/local/go/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin",
                "GOLANG_VERSION=1.18.10",
                "GOPATH=/go"
            ],
            "Cmd": [
                "/bin/sh",
                "-c",
                "go run app/main.go"
            ]
```

Menampilkan metadata dari image roymunduss/expose.

22. Docker Container

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name expose -p 8080:8080 roymunduss/expose
380ef33afff82219b9228d24beee2f1a8db025a853b0bae174e9e953eb053352
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start expose
expose
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container ls
CONTAINER ID   IMAGE              COMMAND                  CREATED              STATUS          PORTS                    NAMES
380ef33afff8   roymunduss/expose  "/bin/sh -c 'go run …"   About a minute ago   Up 52 seconds   0.0.0.0:8080->8080/tcp   expose
```

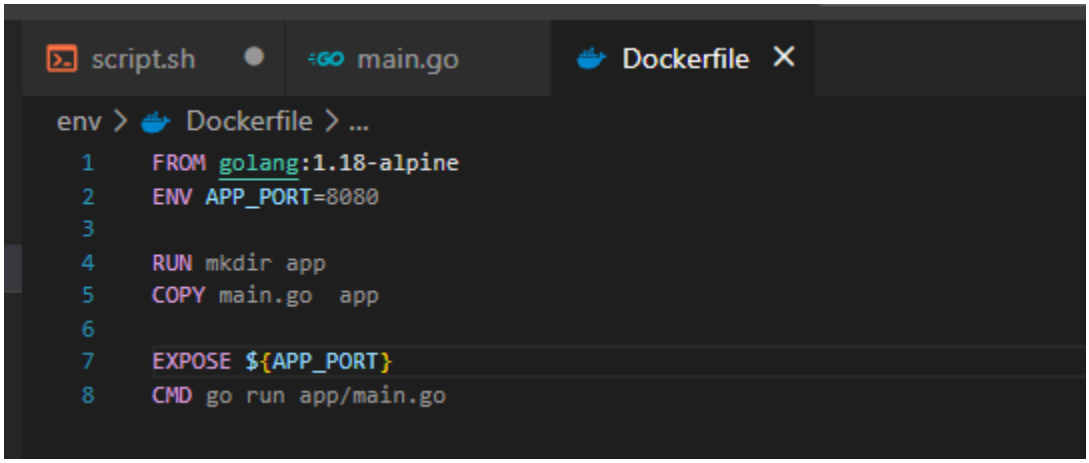
docker container create --name expose -p 8080:8080 roymunduss/expose: Membuat container expose dan memetakan port 8080 di container ke port 8080 di host.

docker container start expose: Menjalankan container expose.

docker container ls: Menampilkan daftar container yang sedang berjalan.

docker container stop expose: Menghentikan container expose.

23. ENV Instrruction



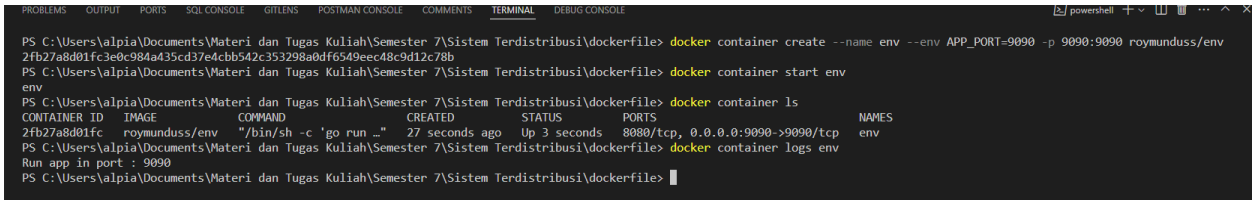
24. Docker Build

Membangun image yang menggunakan instruksi ENV untuk mendefinisikan variabel lingkungan.

25. Inspect Docker Image

docker image inspect roymunduss/env: Menampilkan metadata dari image roymunduss/env

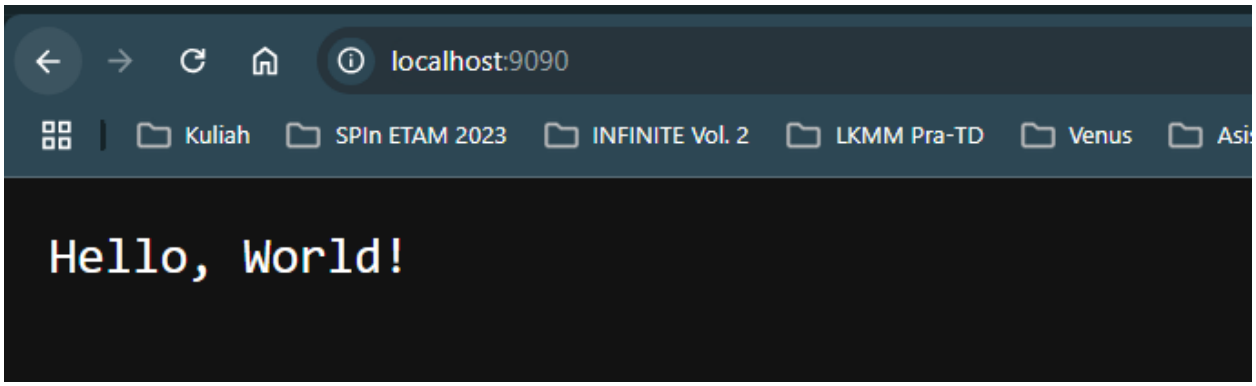
26. Docker Container



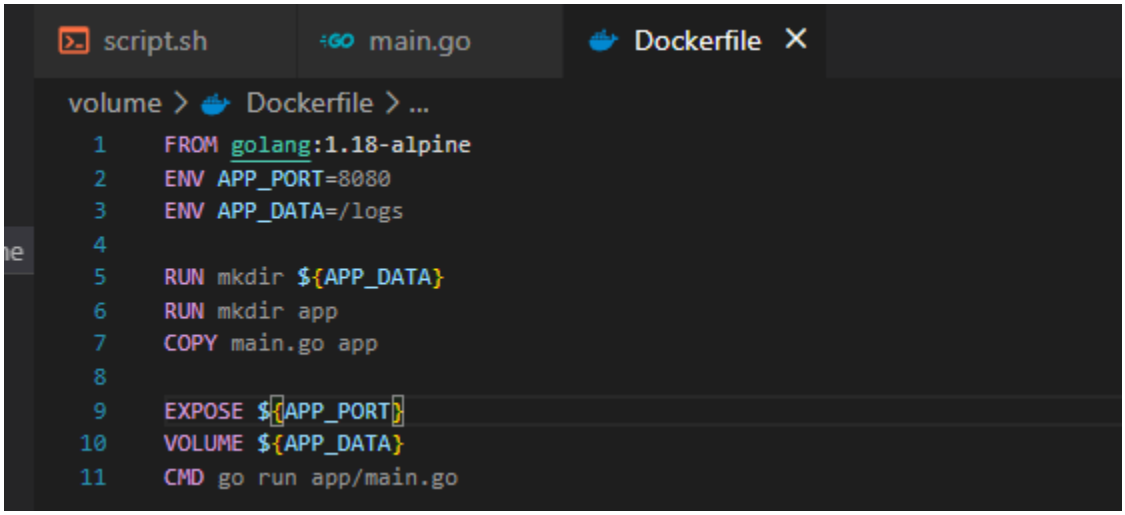
docker container create --name env --env APP_PORT=9090 -p 9090:9090 roymunduss/env: Membuat container bernama env, mengekspor variabel lingkungan APP_PORT=9090, dan memetakan port 9090.

docker container start env: Menjalankan container env

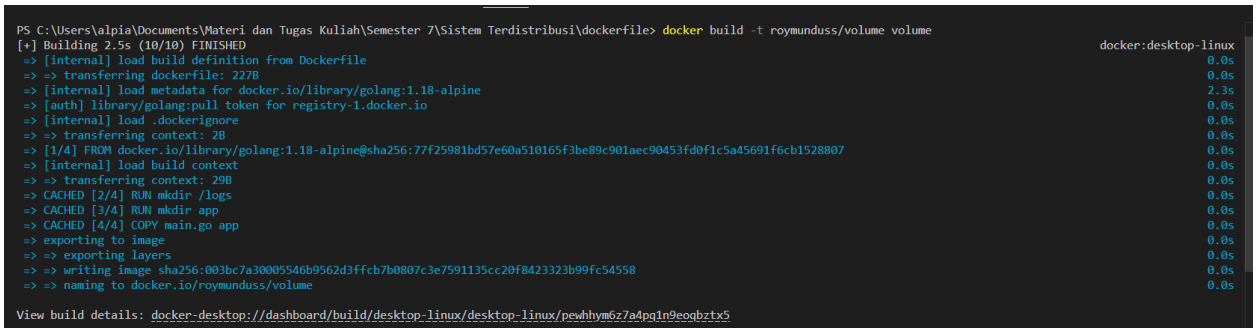
docker container logs env: Menampilkan log dari container env.



27. Volume Instruction

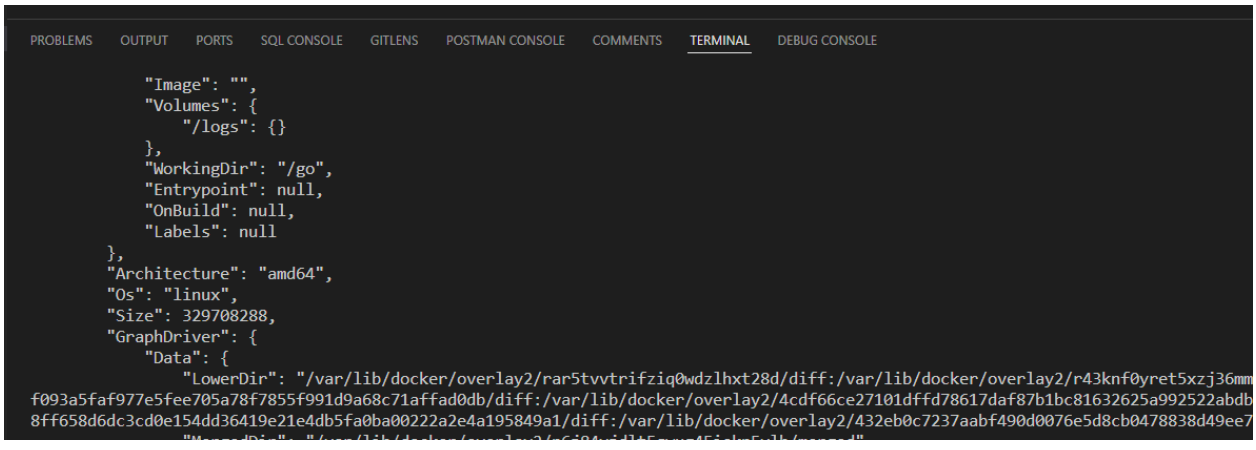


28. Docker Build



Membangun image Docker yang menggunakan VOLUME untuk membuat mount point di dalam container.

29. Docker Image Inspect



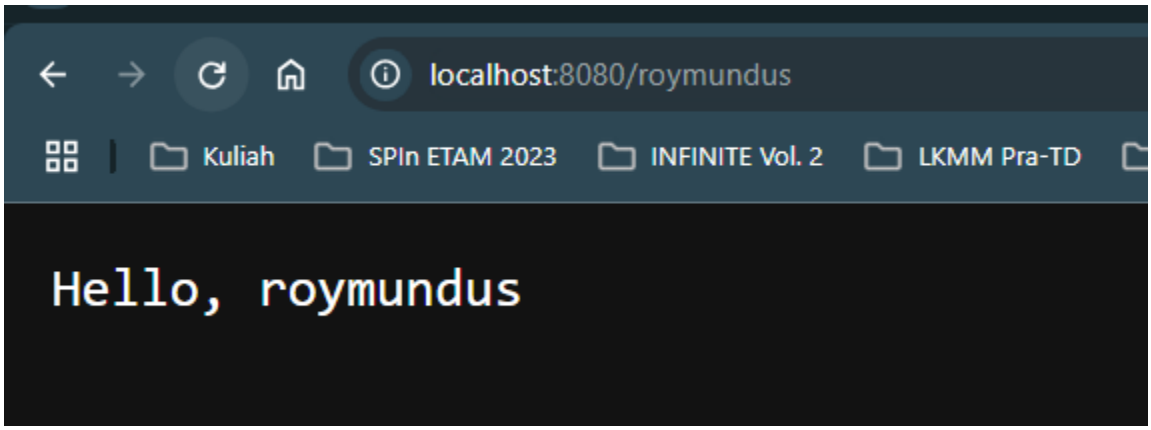
Menampilkan metadata dari image roymunduss/volume.

30. Docker Container

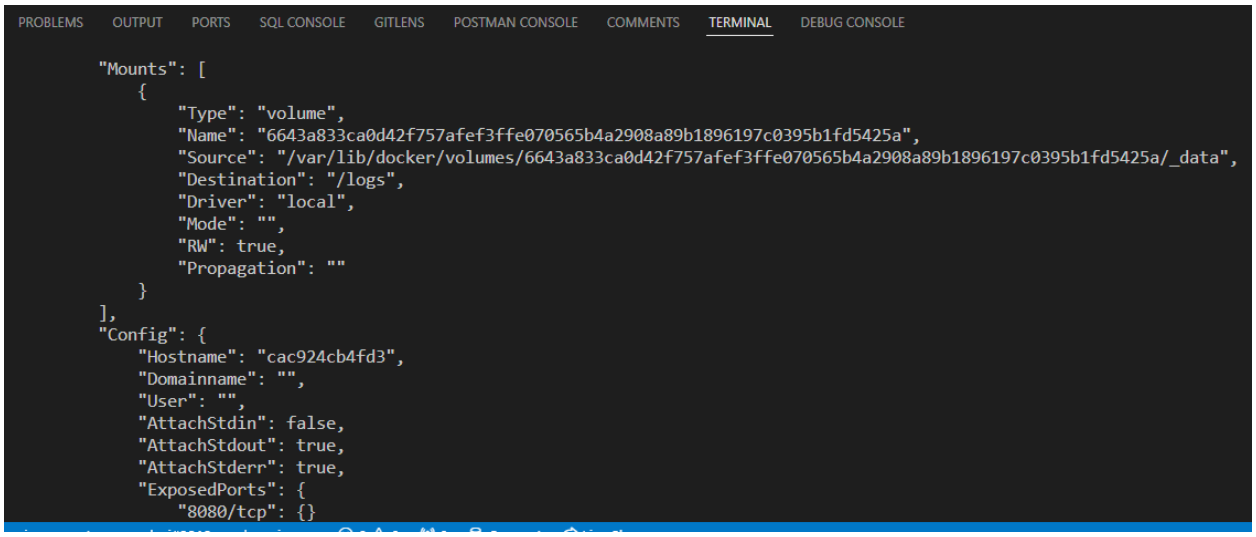
```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name volume -p 8080:8080 roymunduss/volume
cac924cb4fd3ff76d9bbd92e28b884dfeb4491260d4e1ed3d8df6ced3a589d54
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start volume
volume
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container logs volume
Run app in port : 8080
DONE Write File : /logs/.txt
DONE Write File : /logs/favicon.ico.txt
DONE Write File : /logs/alpian.txt
DONE Write File : /logs/favicon.ico.txt
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container logs volume
Run app in port : 8080
DONE Write File : /logs/.txt
DONE Write File : /logs/favicon.ico.txt
DONE Write File : /logs/alpian.txt
DONE Write File : /logs/favicon.ico.txt
DONE Write File : /logs/roymundus.txt
DONE Write File : /logs/favicon.ico.txt
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

docker container create --name volume -p 8080:8080 roymunduss/volume: Membuat container bernama volume dan memetakan port 8080.

docker container start volume: Menjalankan container volume.



31. Docker Container Inspect



docker container inspect volume: Menampilkan informasi detail dari container volume.

32. Docker Volume

```
94
95    docker container inspect volume
96    6643a833ca0d42f757afef3ffe070565b4a2908a89b1896197c0395b1fd5425a

PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  GITLENS  POSTMAN CONSOLE  COMMENTS  TERMINAL  DEBUG CONSOLE

DRIVER    VOLUME NAME
local     00daeb51d626bde381a492f82b27e4ddbfbae60368460082ed8c032cdbe500ea
local     6ee8c93b01b4656b76632a80abbbcc11111146a957b56b8f91fa8bcb200fab1a
local     21d498188bafd848bdf26fd1e134781a3746e0473ac19bfe2d0a5377f6adb281
local     703f4c5af90b0cbb1891068be3e62a68a110f8c0188c9c8951d76573593c4252
local     6088c54b6fe2082aeaf371f086f72071ff4d3fb3b18bcf064dcff4787bf19be2
local     6643a833ca0d42f757afef3ffe070565b4a2908a89b1896197c0395b1fd5425a
local     859594885fb12797e5041eba6882fe2315dffc7907257e2aad3950d988eb2e6c
local     c9c3f93cffc992465354c91e393ab37f1efaffd650b7dc9c4d35ddc28d68c4f8
local     mongodata
local     mongodatabackup
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Melihat bahwa nama Volume sesuai dan sudah ada.

33. Working Directory Instruction

```
script.sh   main.go   Dockerfile ×
workdir > Dockerfile > ...
1   FROM golang:1.18-alpine
2
3   WORKDIR /app
4   COPY main.go /app
5
6   EXPOSE 8080
7   CMD go run main.go
```

34. Docker Build

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container ls
CONTAINER ID   IMAGE              COMMAND                  CREATED       STATUS       PORTS                    NAMES
cac924cb4fd3   roymunduss/volume  "/bin/sh -c 'go run …"   7 hours ago   Up 7 hours   0.0.0.0:8080->8080/tcp   volume
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container stop volume
volume
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container ls
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS     NAMES
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Memastikan tidak ada docker container yang berjalan.

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/workdir workdir
[+] Building 3.5s (9/9) FINISHED                                                                                  docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                                              0.1s
 => => transferring dockerfile: 130B                                                                                              0.0s
 => [internal] load metadata for docker.io/library/golang:1.18-alpine                                                             2.8s
 => [auth] library/golang:pull token for registry-1.docker.io                                                                     0.0s
 => [internal] load .dockerignore                                                                                                 0.1s
 => => transferring context: 2B                                                                                                   0.0s
 => CACHED [1/3] FROM docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807  0.0s
 => [internal] load build context                                                                                                 0.1s
 => => transferring context: 290B                                                                                                 0.0s
 => [2/3] WORKDIR /app                                                                                                            0.1s
 => [3/3] COPY main.go /app                                                                                                       0.1s
 => exporting to image                                                                                                            0.2s
 => => exporting layers                                                                                                           0.1s
 => => writing image sha256:4a0b1609940c00a445ea87e72fe29d84f62c9e72769fff579d5efe0b3c4cb42f                                      0.0s
 => => naming to docker.io/roymunduss/workdir                                                                                     0.0s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/fcypczx0ssgaatvg9q29i68ol
```

Membangun image yang menggunakan WORKDIR untuk menetapkan direktori kerja default dalam container.

35. Docker Container

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name workdir -p 8080:8080 roymunduss/workdir
c7889c476a91e8f001c302fcc7a4ad12ed6772d88f4c0b19056363e457c5e8ed
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start workdir
workdir
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container exec -i -t workdir /bin/sh
/app # pwd
/app
/app # exit
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Menjalankan shell interaktif di dalam container workdir.

36. User Instructions

script.sh | Dockerfile user | main.go | Dockerfile workdir

user > Dockerfile > ...

```dockerfile
FROM golang:1.18-alpine

RUN mkdir /app

RUN addgroup -S humangroup
RUN adduser -S -D -h /app humanuser humangroup
RUN chown -Rhumanuser:humangroup /app
USER humanuser

COPY main/go /app

EXPOSE 8080
CMD go run /app/main.go

```

37. Docker Build

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/user user
[+] Building 2.5s (11/11) FINISHED                                                                                docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                                              0.1s
 => => transferring dockerfile: 277B                                                                                              0.0s
 => [internal] load metadata for docker.io/library/golang:1.18-alpine                                                             1.4s
 => [internal] load .dockerignore                                                                                                 0.0s
 => => transferring context: 2B                                                                                                   0.0s
 => [internal] load build context                                                                                                 0.0s
 => => transferring context: 29B                                                                                                  0.0s
 => [1/6] FROM docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807        0.0s
 => CACHED [2/6] RUN mkdir /app                                                                                                   0.0s
 => CACHED [3/6] RUN addgroup -S humangroup                                                                                       0.0s
 => CACHED [4/6] RUN adduser -S -D -h /app humanuser humangroup                                                                   0.0s
 => [5/6] RUN chown -R humanuser:humangroup /app                                                                                  0.5s
 => [6/6] COPY main.go /app                                                                                                       0.1s
 => exporting to image                                                                                                            0.2s
 => => exporting layers                                                                                                           0.2s
 => => writing image sha256:d4ab9cac7b442b1ee36f43d94f6a927f3e07c7cf975c736f010b00348b261b91                                      0.0s
 => => naming to docker.io/roymunduss/user                                                                                        0.0s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/go98khc5pe3qur4swx4l17ccw
```

Membangun image yang menggunakan instruksi USER untuk menetapkan pengguna yang akan menjalankan container.

38. Docker Container

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name user -p 8080:8080 roymunduss/user
23c34db9aa6054a5a67f13ee74e8a63d9e5160676619b92d7d0902662bbb6a04
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start user
user
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container exec -i -t user /bin/sh
/go $ whoami
humanuser
/go $ exit
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

Menjalankan shell interaktif di dalam container user.

39. Argument Instruction

40. Docker Build

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/arg arg --build-arg app=humanuser
[+] Building 4.2s (10/10) FINISHED                                                                                    docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                                              0.1s
 => => transferring dockerfile: 197B                                                                                              0.0s
 => [internal] load metadata for docker.io/library/golang:1.18-alpine                                                             2.5s
 => [auth] library/golang:pull token for registry-1.docker.io                                                                     0.0s
 => [internal] load .dockerignore                                                                                                 0.1s
 => => transferring context: 2B                                                                                                   0.0s
 => CACHED [1/4] FROM docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807  0.0s
 => [internal] load build context                                                                                                 0.1s
 => => transferring context: 290B                                                                                                 0.0s
 => [2/4] RUN mkdir app                                                                                                           0.5s
 => [3/4] COPY main.go app                                                                                                        0.1s
 => [4/4] RUN mv app/main.go  app/humanuser.go                                                                                    0.7s
 => exporting to image                                                                                                            0.2s
 => => exporting layers                                                                                                           0.1s
 => => writing image sha256:63d92fea368d54cede0be53387120f5219ee9e8e9c12fca26e3a94e88d5e79cc                                      0.0s
 => => naming to docker.io/roymunduss/arg                                                                                         0.0s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/90omha7b35zdew1k6vr2t8vf0
```

Membangun image dengan argumen build-time app=humanuser, yang dapat digunakan di dalam Dockerfile dengan instruksi ARG.

41. Docker Container

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name arg -p 8080:8080 roymunduss/arg
e3e9149cbeb86b8f3093c7658d9bca6608b55d50be27a05c62f0335015c92018
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start aarg
Error response from daemon: No such container: aarg
Error: failed to start containers: aarg
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start arg
arg
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container exec -i -t arg /bin/sh
Error response from daemon: container e3e9149cbeb86b8f3093c7658d9bca6608b55d50be27a05c62f0335015c92018 is not running
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container log arg

Usage:  docker container COMMAND

Manage containers

Commands:
  attach      Attach local standard input, output, and error streams to a running container
  commit      Create a new image from a container's changes
  cp          Copy files/folders between a container and the local filesystem
```

Membangun image dengan argumen build-time app=humanuser, yang dapat digunakan di dalam Dockerfile dengan instruksi ARG.

42. Argument dan Environment Instruction

PROBLEMS OUTPUT PORTS SQL CONSOLE GITLENS POSTMAN CONSOLE COMMENTS TERMINAL DEBUG CONSOLE

```
            "Tty": false,
            "OpenStdin": false,
            "StdinOnce": false,
            "Env": [
                "PATH=/go/bin:/usr/local/go/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin",
                "GOLANG_VERSION=1.18.10",
                "GOPATH=/go"
            ],
            "Cmd": [
                "/bin/sh",
                "-c",
                "go run app/${app}.go"
            ],
            "ArgsEscaped": true,
            "Image": "",
            "Volumes": null
```

script.sh | Dockerfile | main.go

arg > Dockerfile > ...

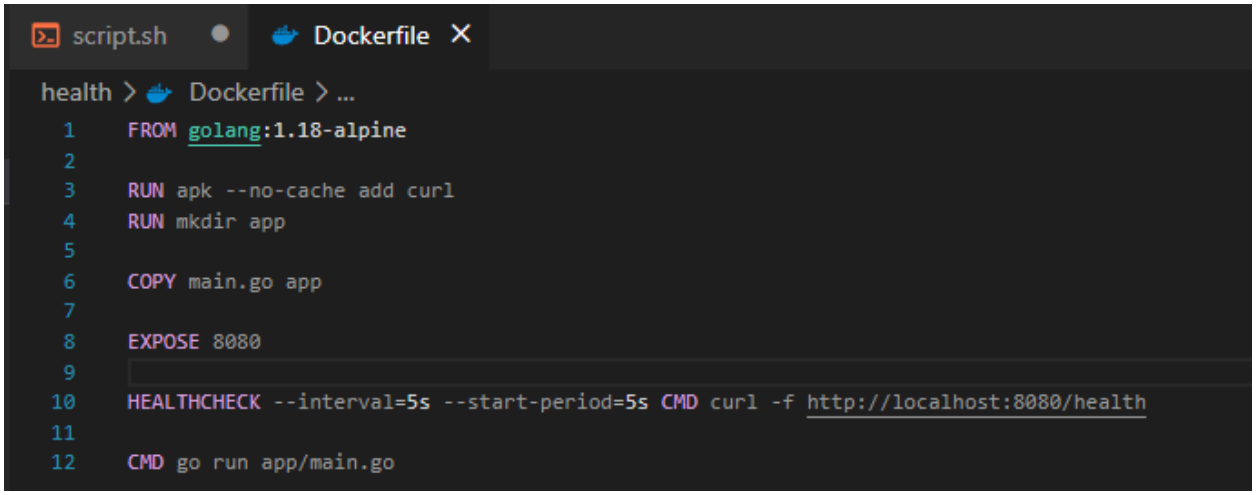
```
1   FROM golang:1.18-alpine
2
3   ARG app=main
4
5   RUN mkdir app
6   COPY main.go app
7   RUN mv app/main.go  app/${app}.go
8
9   EXPOSE 8080
10
11
12  ENV app=${app}
13  CMD go run app/${app}.go
14
15
```

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker build -t roymunduss/arg arg --build-arg app=humanuser
[+] Building 3.0s (10/10) FINISHED                                                                                                                  docker:desktop-linux
 => [internal] load build definition from Dockerfile                                                                                                                0.1s
 => => transferring dockerfile: 215B                                                                                                                                0.0s
 => [internal] load metadata for docker.io/library/golang:1.18-alpine                                                                                               2.7s
 => [auth] library/golang:pull token for registry-1.docker.io                                                                                                       0.0s
 => [internal] load .dockerignore                                                                                                                                   0.0s
 => => transferring context: 2B                                                                                                                                     0.0s
 => [1/4] FROM docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e60a510165f3be89c901aec90453fd0f1c5a45691f6cb1528807                                         0.0s
 => [internal] load build context                                                                                                                                   0.0s
 => => transferring context: 29B                                                                                                                                    0.0s
 => CACHED [2/4] RUN mkdir app                                                                                                                                      0.0s
 => CACHED [3/4] COPY main.go app                                                                                                                                   0.0s
 => CACHED [4/4] RUN mv app/main.go  app/humanuser.go                                                                                                               0.0s
 => exporting to image                                                                                                                                              0.0s
 => => exporting layers                                                                                                                                             0.0s
 => => writing image sha256:743b3d023dcb1f1e7f7bcc8b2b3e43e5a210cd080062a225d0257c94c2683e89                                                                        0.0s
 => => naming to docker.io/roymunduss/arg                                                                                                                           0.0s

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/n8xan207330abyff2juazpnr6
```

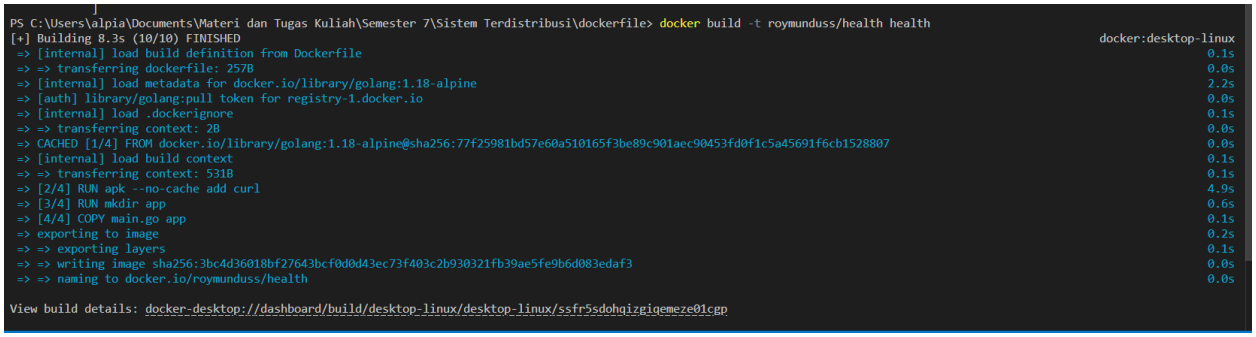
```
            "Domainname": "",
            "User": "",
            "AttachStdin": false,
            "AttachStdout": false,
            "AttachStderr": false,
            "ExposedPorts": {
                "8080/tcp": {}
            },
            "Tty": false,
            "OpenStdin": false,
            "StdinOnce": false,
            "Env": [
                "PATH=/go/bin:/usr/local/go/bin:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin",
                "GOLANG_VERSION=1.18.10",
                "GOPATH=/go",
                "app=humanuser"
            ],
            "Cmd": [
                "/bin/sh",
                "-c",
                "go run app/${app}.go"
```

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name arg -p 8080:8080 roymunduss/arg
e1b448f05142b14b7f78c72b3df9536cf037f38b61bc6080c249855847f8a618
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start arg
arg
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container exec -i -t arg /bin/sh
/go # cd /app
/bin/sh: cd: can't cd to /app: No such file or directory
/go # cd app
/go/app # ls -l
total 4
-rwxr-xr-x    1 root     root           254 Oct 18 14:51 humanuser.go
/go/app # exit
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container stop arg
arg
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

43. Health Check Instruction

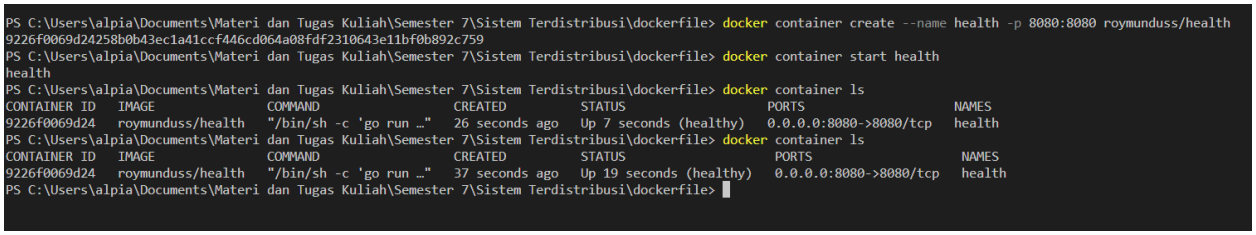


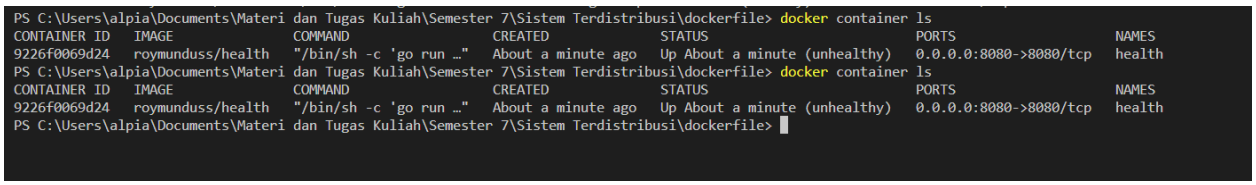
44. Docker Build



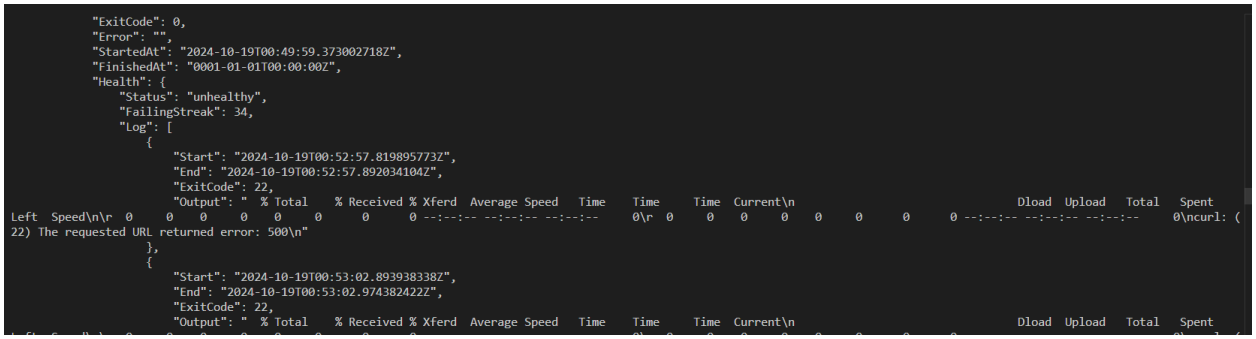
Membangun image yang menggunakan instruksi HEALTHCHECK untuk menentukan mekanisme pemantauan kesehatan container.

45. Docker Container



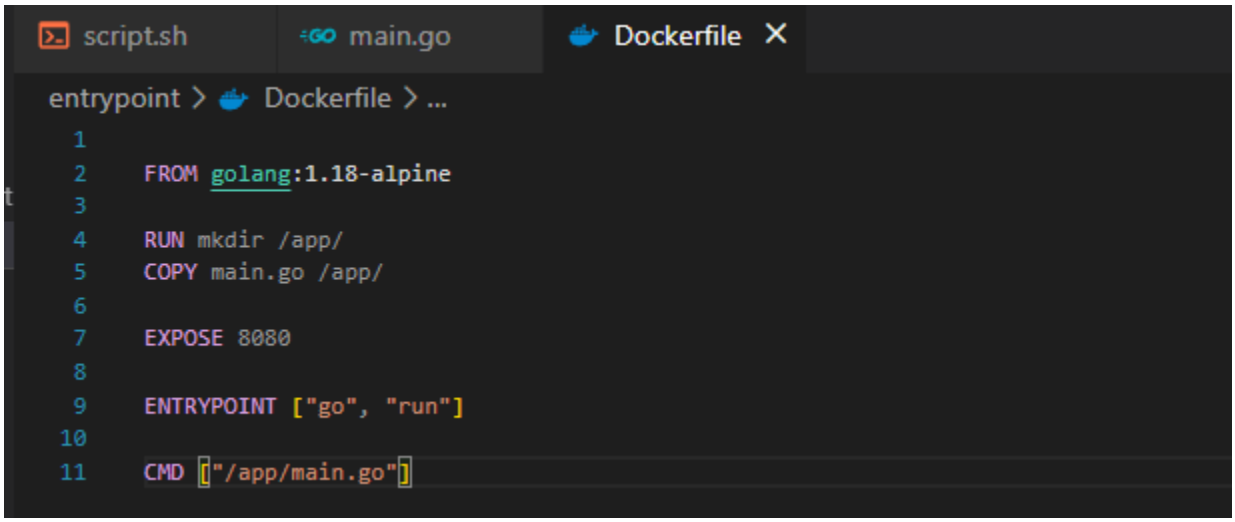


46. Docker Container Inspect

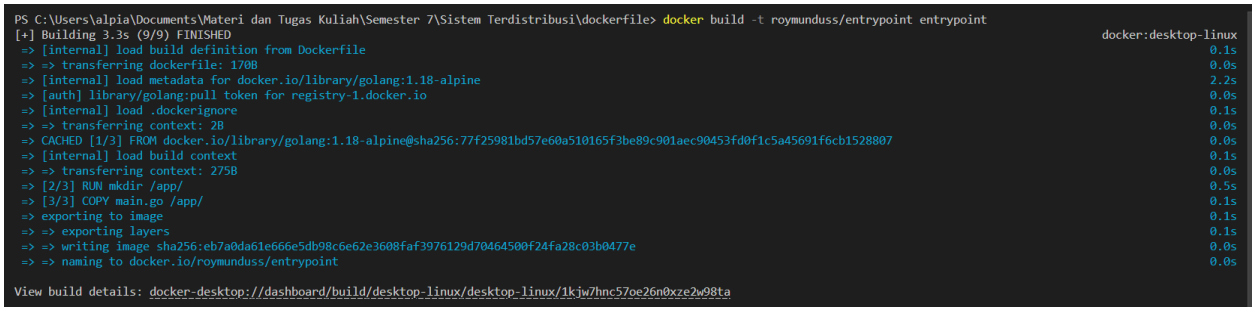


Menampilkan informasi kesehatan dan status dari container health.

47. Entrypoint Instruction



48. Docker Build



```
PROBLEMS  OUTPUT  PORTS  SQL CONSOLE  GITLENS  POSTMAN CONSOLE  COMMENTS  TERMINAL  DEBUG CONSOLE

            "ArgsEscaped": true,
            "Image": "",
            "Volumes": null,
            "WorkingDir": "/go",
            "Entrypoint": [
                "go",
                "run"
            ],
            "OnBuild": null,
            "Labels": null
        },
        "Architecture": "amd64",
        "Os": "linux",
        "Size": 329707878,
        "GraphDriver": {
            "Data": {
```

Membangun image dengan instruksi ENTRYPOINT, yang menentukan program default yang akan dijalankan saat container dimulai.

49. Docker Container

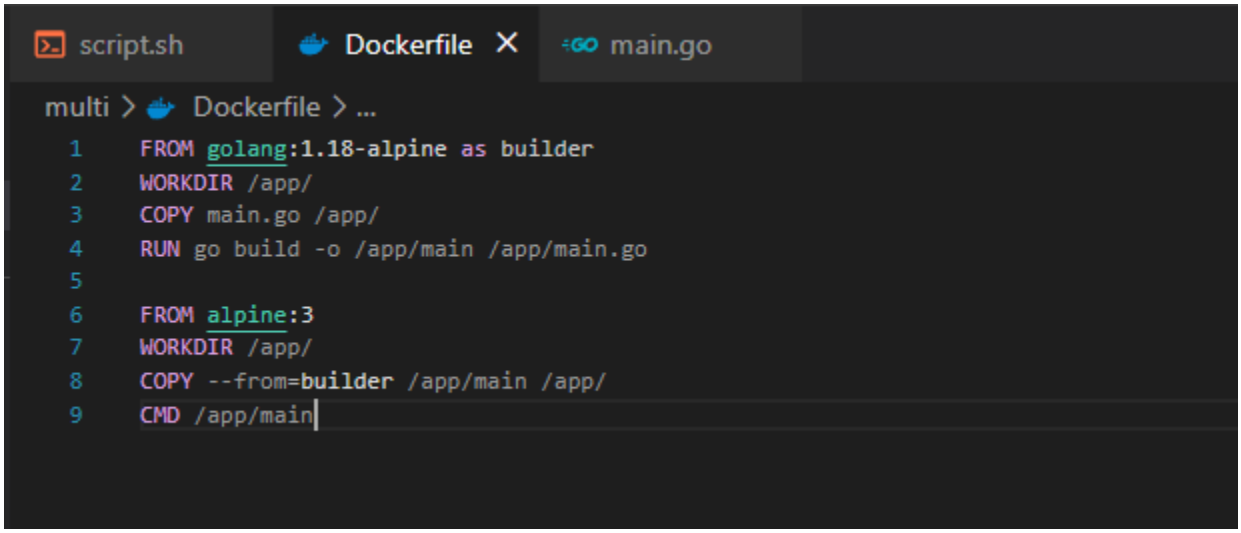
```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name entrypoint -p 8080:8080 roymunduss/entrypoint
c58a8e399833ee473b3d5cac2f9e25238e7381ce5c747456d32621016d8e42b2
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start entrypoint
entrypoint
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container logs entrypoint
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container exec -i -t entrypoint /bin/sh
/go # exit
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```

50. Image Size

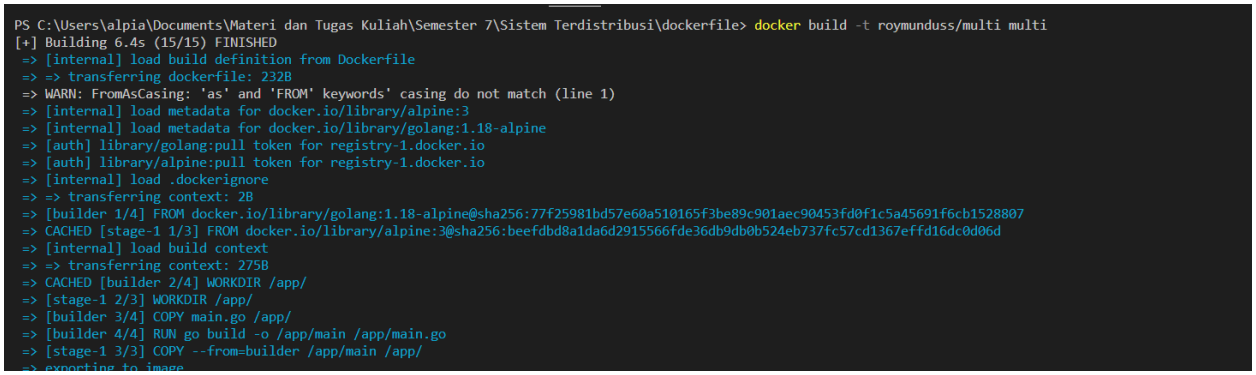
```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker image ls
REPOSITORY                TAG       IMAGE ID       CREATED          SIZE
roymunduss/entrypoint     latest    eb7a0da61e66   6 minutes ago    330MB
roymunduss/health         latest    3bc4d36018bf   20 minutes ago   332MB
roymunduss/arg            latest    743b3d023dcb   45 minutes ago   330MB
roymunduss/user           latest    d4ab9cac7b44   55 minutes ago   330MB
roymunduss/workdir        latest    4a0b1609940c   2 hours ago      330MB
<none>                    <none>    d07ada86fcc3   9 hours ago      330MB
roymunduss/volume         latest    003bc7a30005   9 hours ago      330MB
roymunduss/env            latest    5d46f4b0ed82   10 hours ago     330MB
roymunduss/expose         latest    899acffcb42e   10 hours ago     330MB
roymunduss/ignore         latest    9c3a40eccb35   10 hours ago     7.8MB
<none>                    <none>    d3973b719ca9   10 hours ago     7.8MB
roymunduss/copy           latest    89fe45c3d723   20 hours ago     7.8MB
roymunduss/add            latest    b9587e02ca46   2 days ago       7.8MB
roymunduss/command        latest    6e2f1bf742bc   2 days ago       7.8MB
roymunduss/label          latest    a391ac87bce5   2 days ago       7.8MB
roymundus/run             latest    c009f86465e5   2 days ago       7.8MB
<none>                    <none>    1f582c642cbe   2 days ago       7.8MB
getting-started           latest    c45e3d174ab7   2 weeks ago      471MB
mongo                     latest    4d441da0b855   4 weeks ago      861MB
roymunduss/from           latest    e75ff1d806b9   6 weeks ago      7.8MB
ubuntu                    latest    b1e9cef3f297   7 weeks ago      78.1MB
nginx                     latest    9527c0f683c3   2 months ago     188MB
redis                     latest    7e49ed81b42b   2 months ago     117MB
mongo-express             latest    870141b735e7   7 months ago     182MB
```

Melihat image yang ada

51. Multi Stage Build



52. Docker Build



Membangun image menggunakan teknik multi-stage build untuk mengoptimalkan ukuran dan layer image.

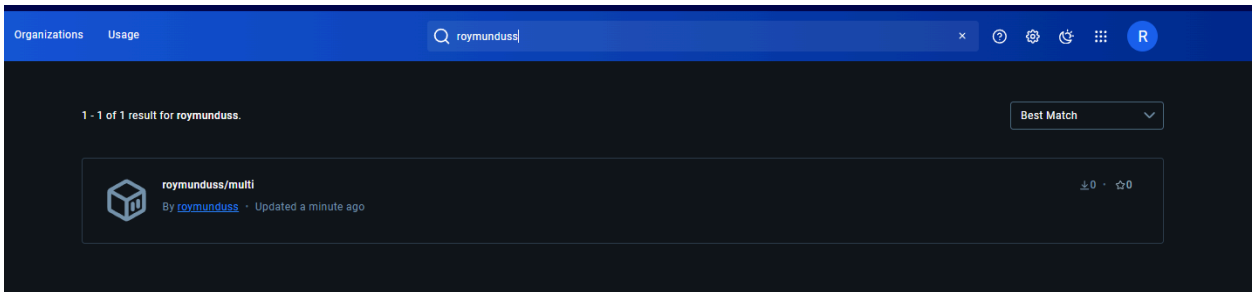
53. Docer Image & Container

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker image
REPOSITORY              TAG       IMAGE ID       CREATED             SIZE
roymunduss/multi        latest    980d47849356   44 seconds ago      14.1MB
roymunduss/entrypoint   latest    eb7a0da61e66   15 minutes ago      330MB
roymunduss/health       latest    3bc4d36018bf   29 minutes ago      332MB
roymunduss/arg          latest    743b3d023dcb   54 minutes ago      330MB
roymunduss/user         latest    d4ab9cac7b44   About an hour ago   330MB
roymunduss/workdir      latest    4a0b1609940c   3 hours ago         330MB
<none>                  <none>    d07ada86fcc3   9 hours ago         330MB
roymunduss/volume       latest    003bc7a30005   9 hours ago         330MB
roymunduss/env          latest    5d46f4b0ed82   10 hours ago        330MB
roymunduss/expose       latest    899acffcb42e   10 hours ago        330MB
roymunduss/ignore       latest    9c3a40eccb35   11 hours ago        7.8MB
<none>                  <none>    d3973b719ca9   11 hours ago        7.8MB
roymunduss/copy         latest    89fe45c3d723   21 hours ago        7.8MB
roymunduss/add          latest    b9587e02ca46   2 days ago          7.8MB
roymunduss/label        latest    a391ac87bce5   2 days ago          7.8MB
roymundus/run           latest    c009f86465e5   2 days ago          7.8MB
```

```
docker/getting-started   latest    9e4394f6b72f   22 months ago       47MB
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container create --name multi -p 8080:8080 roymunduss/multi
Error response from daemon: Conflict. The container name "/multi" is already in use by container "cfd56424614d50f72d267e3f036023775ca8d2d9f02121494750ff972549689f". You have to remov
e (or rename) that container to be able to reuse that name.
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start multi
Error response from daemon: driver failed programming external connectivity on endpoint multi (20ecff2bc74d36334cc712005ed3a3c07aa4dd2cffde21d360ae156147303f0c): Bind for 0.0.0.0:808
0 failed: port is already allocated
Error: failed to start containers: multi
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container stop multi
multi
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container start multi
Error response from daemon: driver failed programming external connectivity on endpoint multi (7584f4f0f8c06427ed0d8f43490d9f9fdf93b6e6df6718429d17382772c0dc67): Bind for 0.0.0.0:808
0 failed: port is already allocated
Error: failed to start containers: multi
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker container stop multi
multi
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
nmingunpas/wpu-resolusi#2218 needs reviewers  ⊗ 0 ⚠ 0  0  Connect  Live Share   Ln 163, Col 1 (28 selected)  Spaces: 4  UTF-8  LF  Shell Script  Go Live
```

54. Docker Push

```
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker login -u roymunduss
Password:
Login Succeeded
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile> docker push roymunduss/multi
Using default tag: latest
The push refers to repository [docker.io/roymunduss/multi]
4105e2ec6783: Pushed
88780845d09c: Pushed
63ca1fbb43ae: Mounted from library/alpine
latest: digest: sha256:c3fe991cfae6b81daa98f859262b8107e5f0bbfb97f83bdf43fe7cd7f61bce48 size: 945
PS C:\Users\alpia\Documents\Materi dan Tugas Kuliah\Semester 7\Sistem Terdistribusi\dockerfile>
```



Melakukan login ke akun Dockerhub dan melakukan push container.