INTRODUCTION TO DOCKER

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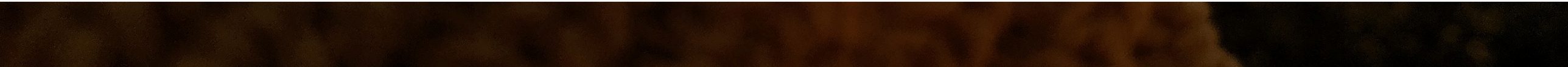
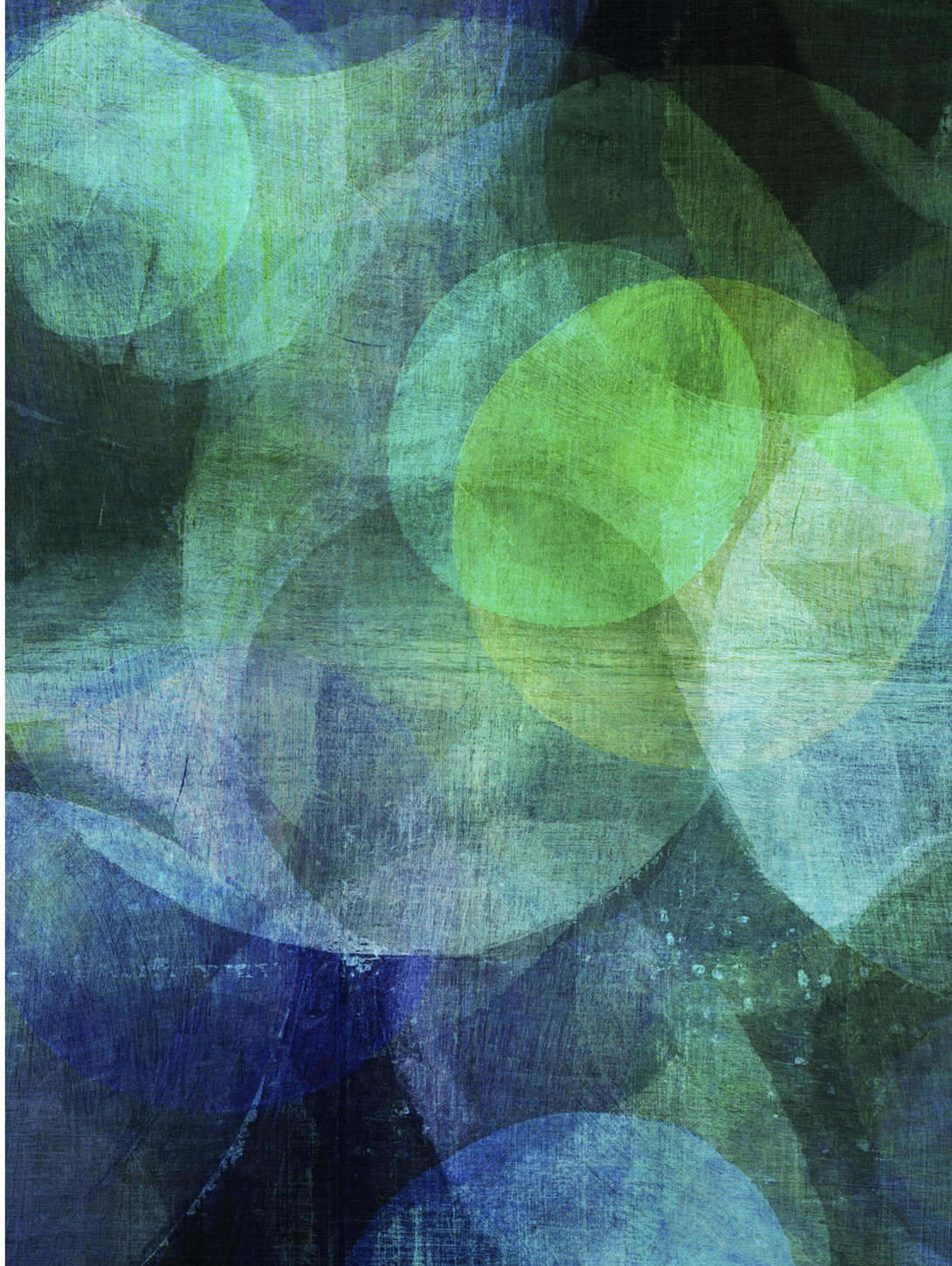
Dockerfile



AGENDA



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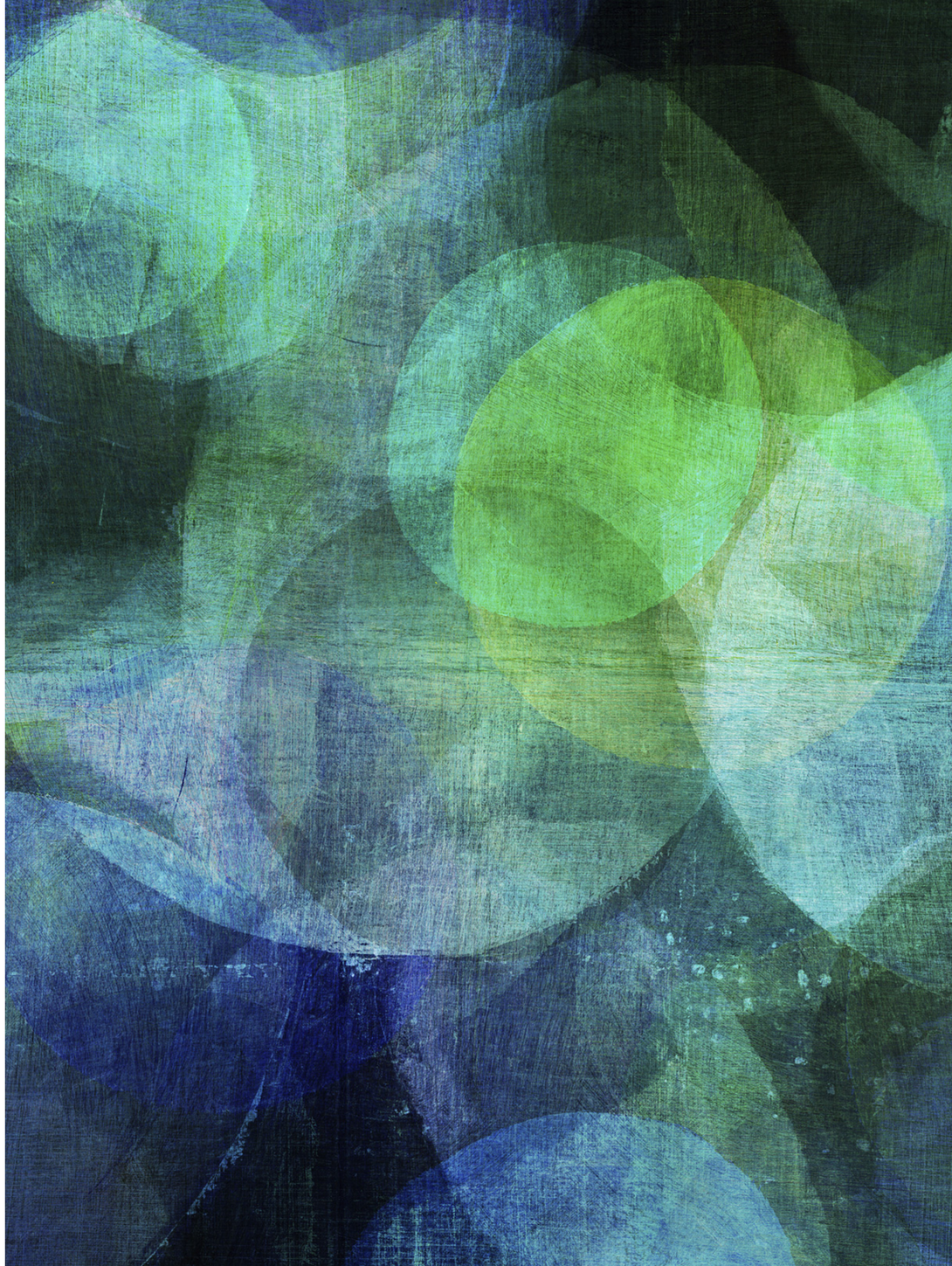
- Dockerfile



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- Dockerfile

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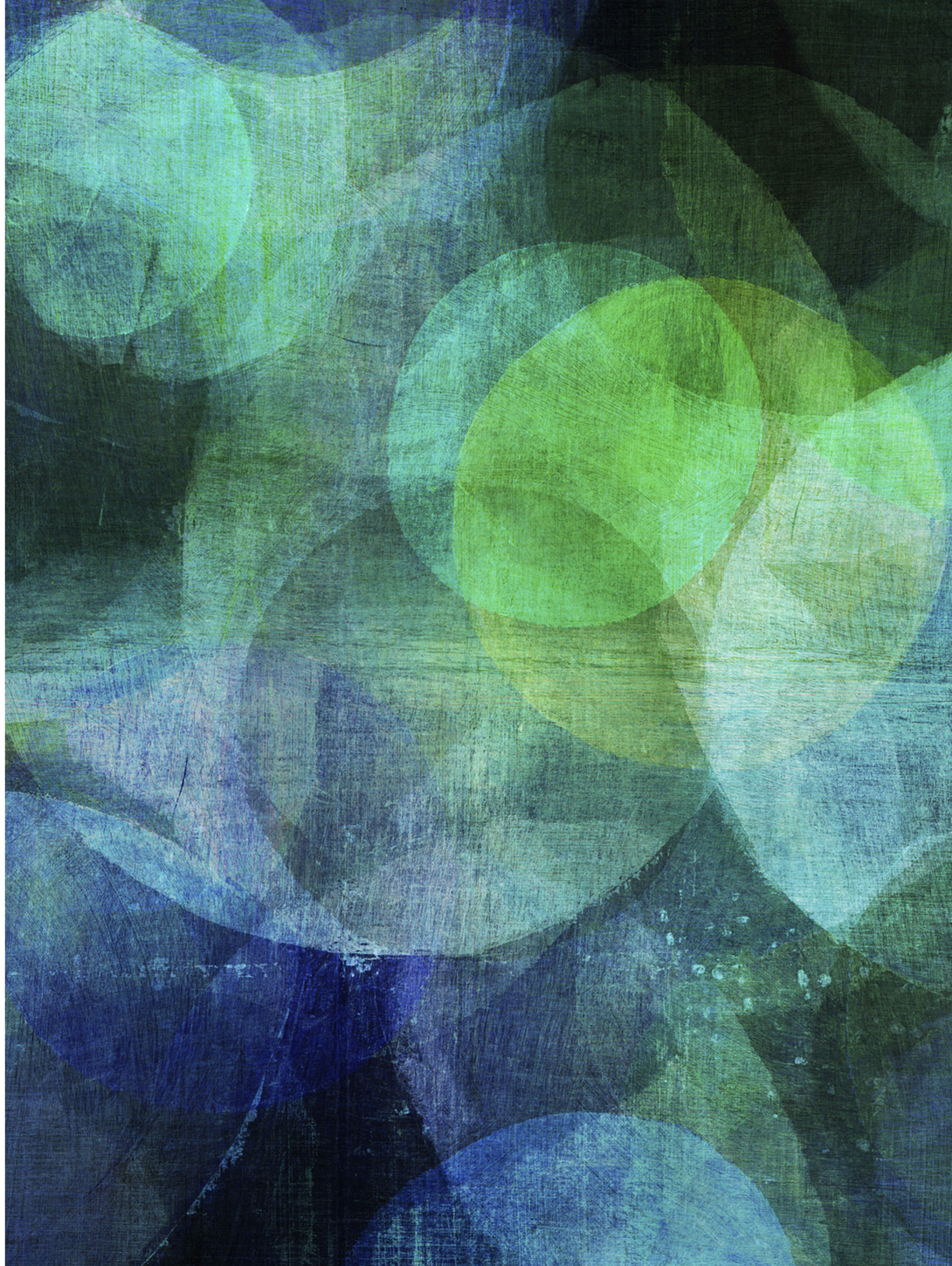
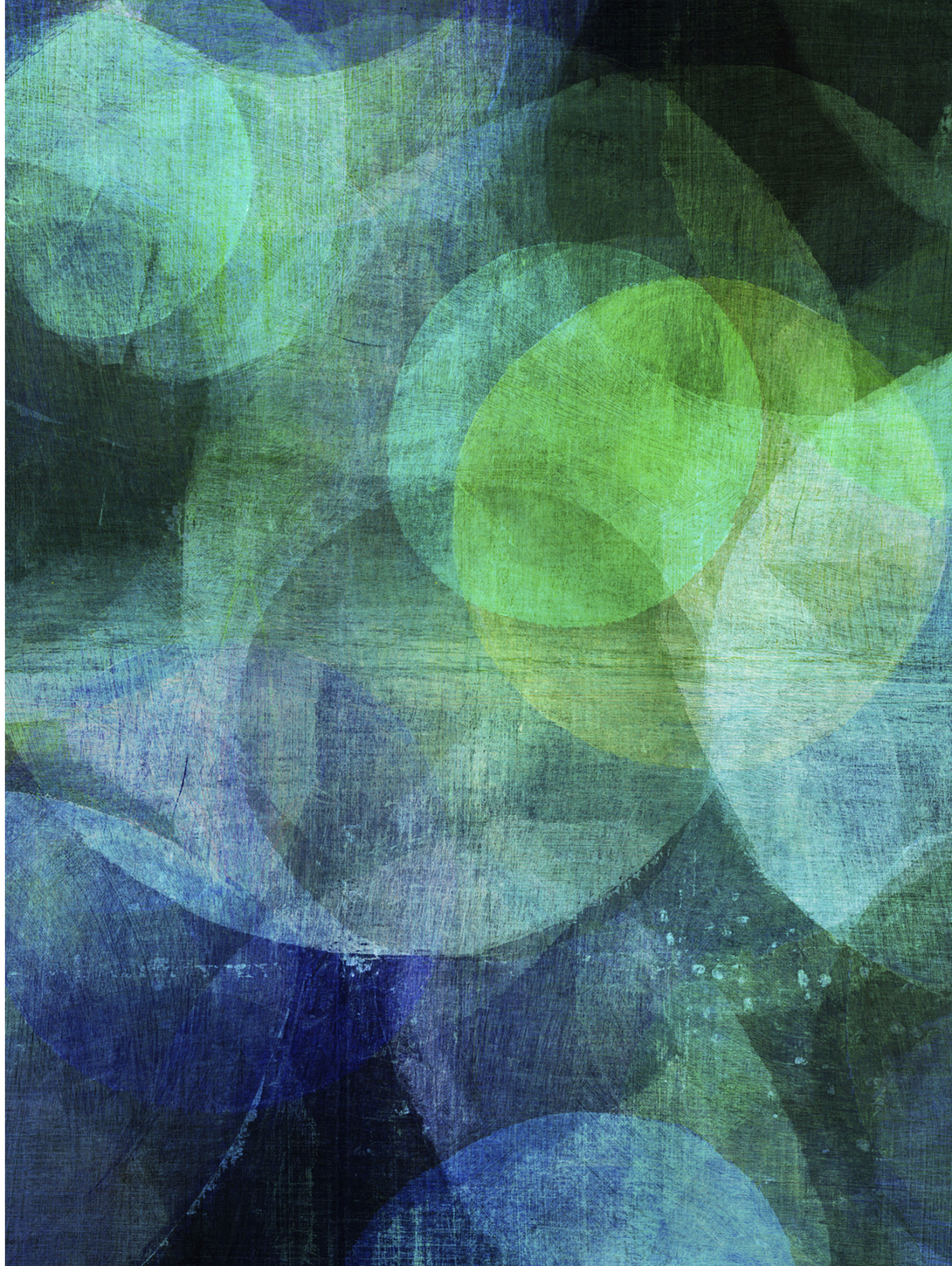


AGENDA

- Dockerfile
- Format
- Instruction



DOCKERFILE

INSTRUCTION ARGRUMENT

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Docker runs instructions in a Dockerfile in order. A Dockerfile must begin with a FROM instruction.

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Docker runs instructions in a Dockerfile in order. A Dockerfile must begin with a FROM instruction.

Example :

```
1  FROM ubuntu:22.04
```

FROM *[instruction]*

Name and tag of FROM Image *[arguments]*

ENVIRONMENT REPLACEMENT

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```
FROM    busybox
ENV     FOO=/bar
WORKDIR ${FOO}        # WORKDIR /bar
ADD     . $FOO        # ADD . /bar
COPY    \$FOO /quux   # COPY $FOO /quux
```

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Environment variables are supported by the following list of instructions in the Dockerfile:

- ADD
- COPY
- ENV
- EXPOSE
- FROM
- LABEL
- STOPSIGNAL
- USER
- VOLUME
- WORKDIR
- ONBUILD #

INSTRUCTION ON DOCKERFILE

FROM : SETS THE BASE IMAGE

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FROM [--platform=<platform>] <image>[:<tag>] [AS <name>]
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Image = ubuntu

Tag (Version) of Ubuntu Image = 22.04

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Example :

```
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```

Image = ubuntu

Tag (Version) of Ubuntu Image = 22.04

Example :

```
1  FROM nginx:1.21.6
```

Image = nginx

Tag (Version) of nginx Image = 1.21.6

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OR

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Example :

```
2  COPY index.html /usr/share/nginx/html
```

<src> = relative path

<dest> = absolute path or relative from WORKDIR

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First: you can use a URL instead of a local file / directory.

Second: you can extract a tar file (not for zip) from the source directly into the destination.

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Second: you can extract a tar file (not for zip) from the source directly into the destination.

Recommendation from Docker Team :

> *Using COPY in almost all cases. Ultimately, the rule is this: use COPY (unless you're absolutely sure you need ADD).*

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OR

```
RUN [“executable", "param1", “param2"]
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                      cmd /S /C on Windows
RUN <command>
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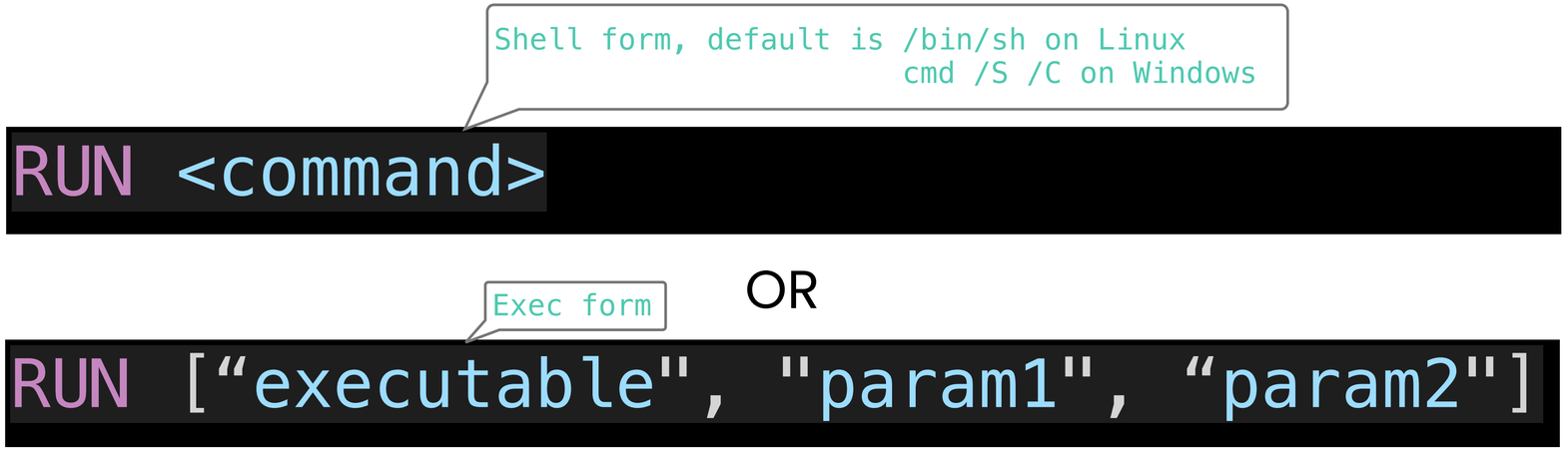

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```
RUN <command>
```

OR

Exec form

```
RUN [“executable", "param1", “param2"]
```

Example :

```
3  RUN npm install
```

<command> = install package dependency from package.json

RUN: MORE EXAMPLE

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Example : More Readable with backslashes

```
3   RUN /bin/bash -c 'source $HOME/.bashrc; \
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```

OR

Example : Merge apt-get update and install to AVIOD Caching Problem

```
3   RUN apt-get update && apt-get install -y \
        package-bar \
        package-baz \
        package-foo  \
        && rm -rf /var/lib/apt/lists/*
```

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```

OR

```
CMD ["param1", “param2"]
```

OR

```
CMD command param1 param2
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OR

Shell form

```
CMD command param1 param2
```

Noted : There **can only be one CMD** instruction in a Dockerfile.
If you list more than one CMD then only the **last CMD** will take effect.

ENTRYPOINT: CONFIGURE EXECUTION POINT

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```
ENTRYPOINT [“executable", "param1", “param2”]
```

OR

```
ENTRYPOINT command param1 param2
```

Example :

```
5  ENTRYPOINT ["java","-jar","/app.jar"]
```

HOW ENTRYPOINT AND CMD INTERACT

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Both **CMD** and **ENTRYPOINT** instructions define what command gets executed when running a container. There are *few rules that describe their co-operation.*

1. Dockerfile should specify *at least one* of **CMD** or **ENTRYPOINT** commands.

2. **ENTRYPOINT** should be defined when using *the container as an executable.*

3. **CMD** should be used as a way of *defining default arguments for an* **ENTRYPOINT** command *or* for executing an *ad-hoc command in a container.*

4. **CMD** will be *overridden* when running the container *with alternative arguments.*

HOW ENTRYPOINT AND CMD INTERACT

	No ENTRYPOINT	ENTRYPOINT exec_entry p1_entry	ENTRYPOINT ["exec_entry", "p1_entry"]
No CMD	**error, not allowed**	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry
CMD ["exec_cmd", "p1_cmd"]	exec_cmd p1_cmd	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry exec_cmd p1_cmd
CMD ["p1_cmd", "p2_cmd"]	p1_cmd p2_cmd	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry p1_cmd p2_cmd
CMD exec_cmd p1_cmd	/bin/sh -c exec_cmd p1_cmd	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry /bin/sh -c exec_cmd p1_cmd

HOW ENTRYPOINT AND CMD INTERACT

The table shows what command is executed for different **ENTRYPOINT** / **CMD** combinations:

	No ENTRYPOINT	ENTRYPOINT exec_entry p1_entry	ENTRYPOINT [“exec_entry”, “p1_entry”]
No CMD	error, not allowed	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry
CMD [“exec_cmd”, “p1_cmd”]	exec_cmd p1_cmd	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry exec_cmd p1_cmd
CMD [“p1_cmd”, “p2_cmd”]	p1_cmd p2_cmd	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry p1_cmd p2_cmd
CMD exec_cmd p1_cmd	/bin/sh -c exec_cmd p1_cmd	/bin/sh -c exec_entry p1_entry	exec_entry p1_entry /bin/sh -c exec_cmd p1_cmd

WORKDIR: SETS THE WORKING DIRECTORY FROM IMAGE/CONTAINER

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The **WORKDIR** instruction sets the working directory for any **RUN**, **CMD**, **ENTRYPOINT**, **COPY** and **ADD** instructions that follow it in the Dockerfile.

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WORKDIR /path/to/workdir
```

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```
WORKDIR /path/to/workdir
```

Example :

```
2  WORKDIR /application
```

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```
EXPOSE <port> [<port>/<protocal>]
```

Example :

```
2  EXPOSE 80
```

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```
ENV <key>=<value> ...
```

Example :

```
2  ENV MY_NAME="John Doe"
3  ENV MY_DOG=Rex\ The\ Dog
4  ENV MY_CAT=fluffy
```

VOLUME: CREATE MOUNT POINT FOR IMAGE

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```
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```

Example :

```
2 VOLUME ["/var/www", "/var/log/apache2"]
```

THANK YOU