Lab: 建立 docker 映像檔-使用 Dockerfile

透過 docker build 指令來建立映像檔

首先觀察目前的路徑
pwd
/root

建立工作目錄
mkdir sakana

進入該目錄
cd sakana/

建立 Dockerfile
vi Dockerfile
用於註解
後續的流程, 前面都要大寫

FROM 基於那個 image
FROM opensuse:42.1

MAINTAINER 維護作者
MAINTAINER Max Huang < sakana@study-area.org >

RUN 要執行的指令
每一行就是一個 image layer, 儘量將同一種行為放同一行 使用 && 來連接
RUN zypper -n install openssh

使用 docker build 指令建立 image
這邊 最後面是 Dockerfile 所在目錄, 這邊使用 . 目前目錄來指定, 也可以使用絕對路徑

docker build -t testrepo/buildimage .

```
Sending build context to Docker daemon 2.048 kB
Step 1 : FROM opensuse:42.1
 ---> 80bd0f661aef
Step 2 : MAINTAINER Max Huang < sakana@study-area.org >
 ---> Running in c4aba3a10ec7
 ---> a3f0f611196b
Removing intermediate container c4aba3a10ec7
Step 3 : RUN zypper -n install openssh
 ---> Running in 702c7f07ba12
Retrieving repository 'NON-OSS' metadata [......done]
Building repository 'NON-OSS' cache [....done]
Retrieving repository 'OSS' metadata [..................done]
Building repository 'OSS' cache [....done]
Retrieving repository 'OSS Update' metadata [..............done]
Building repository 'OSS Update' cache [....done]
Retrieving repository 'Update Non-Oss' metadata [...done]
Building repository 'Update Non-Oss' cache [....done]
Loading repository data...
Reading installed packages...
Resolving package dependencies...

The following 3 NEW packages are going to be installed:
  libedit0 libncurses6 openssh

The following 3 packages are recommended, but will not be installed (only required packages will be installed):
  audit openssh-helpers xauth
```

```
3 new packages to install.
Overall download size: 1.2 MiB. Already cached: 0 B. After the operation, additional 5.7 MiB will be used.
Continue? [y/n/? shows all options] (y): y
Retrieving package libncurses6-5.9-53.4.x86_64 (1/3), 349.5 KiB (1020.7 KiB unpacked)
Retrieving: libncurses6-5.9-53.4.x86_64.rpm [.done]
Retrieving package libedit0-3.1.snap20140620-3.2.x86_64 (2/3),  94.9 KiB (247.1 KiB unpacked)
Retrieving: libedit0-3.1.snap20140620-3.2.x86_64.rpm [.done]
Retrieving package openssh-6.6p1-11.1.x86_64 (3/3), 830.7 KiB (  4.5 MiB unpacked)
Retrieving: openssh-6.6p1-11.1.x86_64.rpm [..done (37.8 KiB/s)]
Checking for file conflicts: [.......done]
(1/3) Installing: libncurses6-5.9-53.4.x86_64 [.........done]
(2/3) Installing: libedit0-3.1.snap20140620-3.2.x86_64 [.......done]
(3/3) Installing: openssh-6.6p1-11.1.x86_64 [...........done]
Additional rpm output:
Updating /etc/sysconfig/ssh...


 ---> c823a9e4a1a0
Removing intermediate container 702c7f07ba12
Successfully built c823a9e4a1a0
```

- -t 是 tag 後面為 repository 名稱/image 名稱
- 路徑為 Dockerfile 所在目錄, 跟他上層目錄叫啥名字沒有關係...

觀察映像檔

```
# docker   images
REPOSITORY          TAG              IMAGE ID         CREATED          VIRTUAL SIZE
testrepo/buildimage   latest           c823a9e4a1a0       3 minutes ago      168.9 MB
testrepo/testimage    vTEST            c840a5f6ade6       12 hours ago       168.9 MB
opensuse            42.1             80bd0f661aef       5 weeks ago        97.74 MB
opensuse            latest           80bd0f661aef       5 weeks ago        97.74 MB
busybox             latest           b41c5284db84       8 weeks ago        1.093 MB
```

Lab: 映像檔管理 - Tag 與刪除映像檔

設定映像檔 Tag

可以透過 docker tag 設定映像檔的 TAG

觀察映像檔

```
# docker   images
REPOSITORY          TAG              IMAGE ID         CREATED          VIRTUAL SIZE
testrepo/buildimage   latest           c823a9e4a1a0       3 minutes ago      168.9 MB
testrepo/testimage    vTEST            c840a5f6ade6       12 hours ago       168.9 MB
opensuse            42.1             80bd0f661aef       5 weeks ago        97.74 MB
opensuse            latest           80bd0f661aef       5 weeks ago        97.74 MB
busybox             latest           b41c5284db84       8 weeks ago        1.093 MB
```

使用 docker tag 指令建立 TAG

```
# docker   tag    c823a9e4a1a0    testrepo/buildimage:tagTest
```

觀察映像檔

docker images
```
REPOSITORY          TAG          IMAGE ID        CREATED          VIRTUAL SIZE
testrepo/buildimage latest       c823a9e4a1a0    22 minutes ago   168.9 MB
testrepo/buildimage tagTest      c823a9e4a1a0    22 minutes ago   168.9 MB
testrepo/testimage  vTEST        c840a5f6ade6    12 hours ago     168.9 MB
opensuse            42.1         80bd0f661aef    5 weeks ago      97.74 MB
opensuse            latest       80bd0f661aef    5 weeks ago      97.74 MB
busybox             latest       b41c5284db84    8 weeks ago      1.093 MB
```

移除映像檔
如果要移除映像檔, 必須沒有作用中的 container 才可以移除

觀察 container
目前 busybox 沒有 container 使用中, opensuse 有 container 使用中
docker ps
```
CONTAINER ID  IMAGE  COMMAND  CREATED  STATUS  PORTS  NAMES
```

docker ps -a
```
CONTAINER ID  IMAGE     COMMAND      CREATED       STATUS                      PORTS  NAMES
f4b981edb1e5  opensuse  "/bin/bash"  12 hours ago  Exited (0) 26 minutes ago          sleepy_bhabha
3965b5144bdf  opensuse  "/bin/bash"  13 hours ago  Exited (0) 12 hours ago            elegant_brown
1dd047e1ec6b  opensuse  "/bin/bash"  13 hours ago  Exited (0) 13 hours ago            thirsty_archimedes
```

首先嘗試 移除 busybox 映像檔

docker rmi busybox
```
Untagged: busybox:latest
Deleted: b41c5284db849fbc4d486094a8896ba46a470f9d397ddec08e8a3d5dd4b725cd
Deleted: a5d4c53980c6aec4758bfea6b0cc90938ec253c3758a8b6b345a0d37cc7b35cb
```

觀察映像檔

docker images
```
REPOSITORY          TAG          IMAGE ID        CREATED          VIRTUAL SIZE
testrepo/buildimage latest       c823a9e4a1a0    28 minutes ago   168.9 MB
testrepo/buildimage tagTest      c823a9e4a1a0    28 minutes ago   168.9 MB
testrepo/testimage  vTEST        c840a5f6ade6    12 hours ago     168.9 MB
opensuse            latest       80bd0f661aef    5 weeks ago      97.74 MB
opensuse            42.1         80bd0f661aef    5 weeks ago      97.74 MB
```

接下來嘗試刪除 有 container 執行的 image

docker rmi opensuse:42.1
```
Error response from daemon: conflict: unable to remove repository reference
"opensuse:42.1" (must force) - container f4b981edb1e5 is using its referenced image
80bd0f661aef
Error: failed to remove images: [opensuse:42.1]
```

因為 container 仍然使用中所以不能刪除

觀察 container
docker ps -a
```
CONTAINER ID   IMAGE          COMMAND       CREATED        STATUS                      PORTS   NAMES
f4b981edb1e5   80bd0f661aef   "/bin/bash"   13 hours ago   Exited (0) 34 minutes ago           sleepy_bhabha
3965b5144bdf   80bd0f661aef   "/bin/bash"   13 hours ago   Exited (0) 13 hours ago             elegant_brown
1dd047e1ec6b   80bd0f661aef   "/bin/bash"   13 hours ago   Exited (0) 13 hours ago             thirsty_archimedes
```

透過 docker rm 來移除 container

```
# docker rm f4b981edb1e5
f4b981edb1e5
```

觀察 container
```
# docker ps -a
CONTAINER ID   IMAGE          COMMAND       CREATED        STATUS                      PORTS   NAMES
3965b5144bdf   80bd0f661aef   "/bin/bash"   13 hours ago   Exited (0) 13 hours ago             elegant_brown
1dd047e1ec6b   80bd0f661aef   "/bin/bash"   13 hours ago   Exited (0) 13 hours ago             thirsty_archimedes
```

一個一個刪除 container 有時候在實驗環境有點麻煩
所以就把腦筋動到一次刪除所有的 container
docker ps 指令加上 -q 只會列出 container ID

```
# docker ps -aq
3965b5144bdf
1dd047e1ec6b
```

但是做這件事的時候要三思而後行
（ 會刪除所有的 container, 會刪除所有的 container, 會刪除所有的 container ）

```
# docker rm $(docker ps -a -q )
3965b5144bdf
1dd047e1ec6b
```

觀察 container
```
# docker ps -a
CONTAINER ID   IMAGE          COMMAND       CREATED        STATUS                      PORTS   NAMES
```

接下來就可以將沒有 container 使用中的 image 刪除了