
Lab 2:

Running the application on the host directly:

```
[root@serverb ~]# git clone https://github.com/meldafrawi/basic-flask-app.git
Cloning into 'basic-flask-app'...
remote: Enumerating objects: 32, done.
remote: Counting objects: 100% (21/21), done.
remote: Compressing objects: 100% (13/13), done.
remote: Total 32 (delta 8), reused 8 (delta 8), pack-reused 11 (from 1)
Receiving objects: 100% (32/32), 274.91 KiB | 522.00 KiB/s, done.
Resolving deltas: 100% (8/8), done.
```

Cloning the application into the host.

```
[root@serverb basic-flask-app]# python routes.py
Traceback (most recent call last):
  File "/root/basic-flask-app/routes.py", line 1, in <module>
    from flask import Flask, render_template
ModuleNotFoundError: No module named 'flask'
```

The flask library is not installed on the system.

```
[root@serverb basic-flask-app]# dnf install python3-pip --disablerepo=VM_AppStream --disablerepo=VM_BaseOS
Updating Subscription Management repositories.
Unable to read consumer identity

This system is not registered with an entitlement server. You can use subscription-manager to register.

Last metadata expiration check: 0:59:32 ago on Fri 27 Feb 2026 02:33:55 PM EET.
Dependencies resolved.
=====
Package           Architecture      Version       Repository      Size
=====
Installing:
python3-pip      noarch          21.2.3-7.el9   Local_VM_AppStream 2.0 M

Transaction Summary
=====
Install 1 Package

Total size: 2.0 M
```

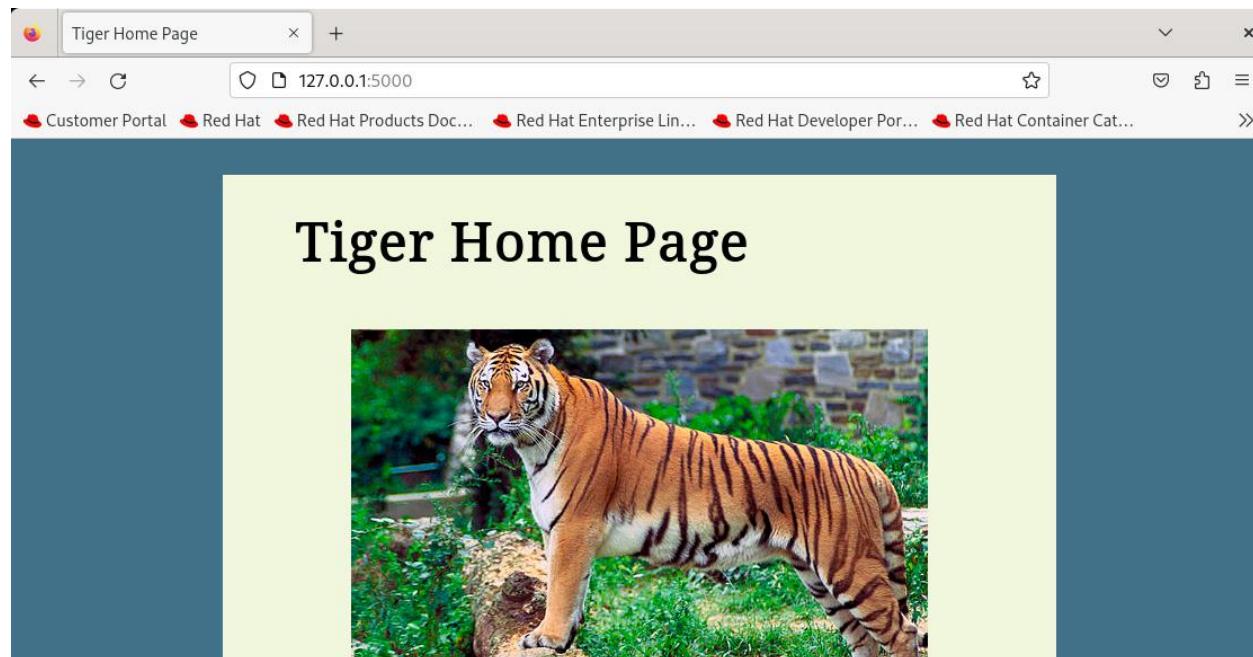
Installing pip because it is not also installed.

```
[root@serverb basic-flask-app]# pip install flask
Collecting flask
  Downloading flask-3.1.3-py3-none-any.whl (103 kB)
    |██████████| 103 kB 986 kB/s
Collecting itsdangerous>=2.2.0
  Downloading itsdangerous-2.2.0-py3-none-any.whl (16 kB)
Collecting markupsafe>=2.1.1
  Downloading markupsafe-3.0.3-cp39-cp39-manylinux2014_x86_64.manylinux_2_17_x86_64.manylinux_2_28_x86_64.whl (20 kB)
Collecting werkzeug>=3.1.0
  Downloading werkzeug-3.1.6-py3-none-any.whl (225 kB)
    |██████████| 225 kB 3.3 MB/s
Collecting blinker>=1.9.0
  Downloading blinker-1.9.0-py3-none-any.whl (8.5 kB)
Collecting importlib-metadata>=3.6.0
  Downloading importlib_metadata-8.7.1-py3-none-any.whl (27 kB)
Collecting jinja2>=3.1.2
  Downloading jinja2-3.1.6-py3-none-any.whl (134 kB)
    |██████████| 134 kB 3.2 MB/s
Collecting click>=8.1.3
  Downloading click-8.1.8-py3-none-any.whl (98 kB)
```

Installing the flask dependency.

```
[root@serverb basic-flask-app]# python routes.py
 * Serving Flask app 'routes'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://192.168.23.130:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 102-633-497
```

Now the application works.



The website works.

Installing the application in a container:

```
[root@serverb basic-flask-app]# cat Dockerfile
FROM alpine

WORKDIR /basic-flask-app

COPY . .

RUN apk add --no-cache python3 py3-pip

RUN pip install flask --break-system-packages

ENTRYPOINT ["python","routes.py"]
[root@serverb basic-flask-app]#
```

Creating the Dockerfile.

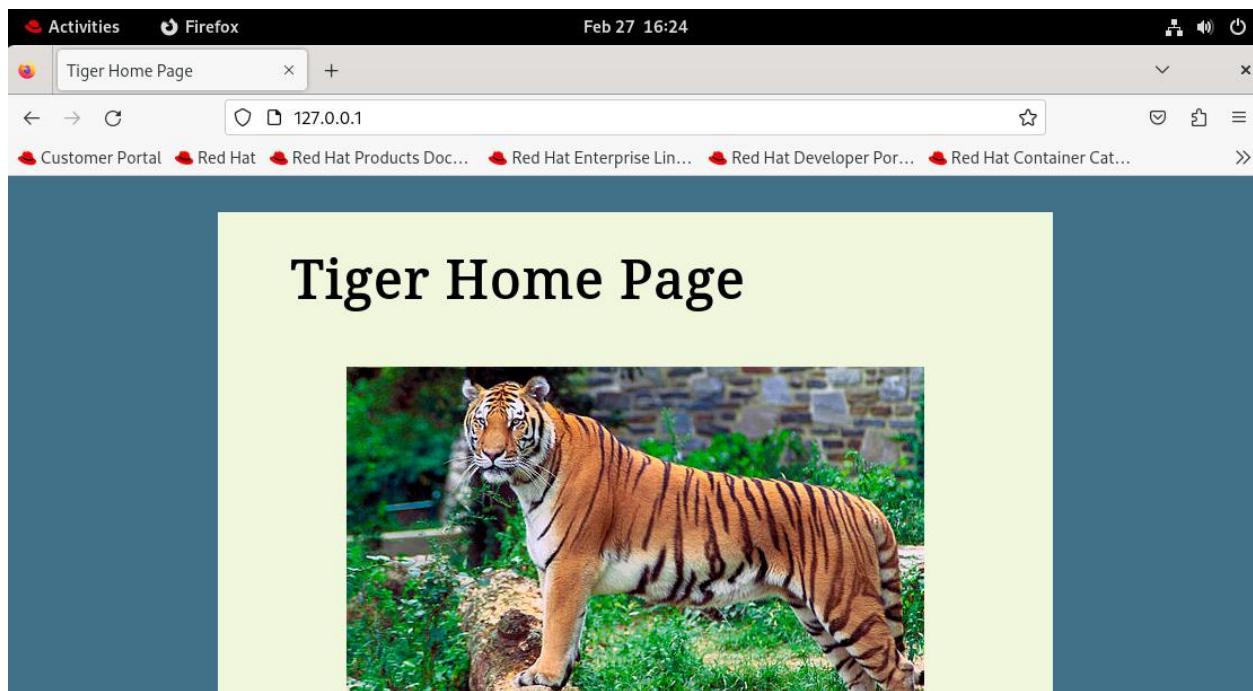
```
[root@serverb basic-flask-app]# docker build -t tasneemadel/basic-flask-app .
[+] Building 34.3s (10/10) FINISHED
   => [internal] load build definition from Dockerfile
   => => transferring dockerfile: 260B
   => [internal] load metadata for docker.io/library/alpine:latest
   => [internal] load .dockerignore
   => => transferring context: 2B
   => [1/5] FROM docker.io/library/alpine:latest@sha256:25109184c71bdad752c8312a8623239686a9a2071e8825f20acb8f2198c3f659
   => => resolve docker.io/library/alpine:latest@sha256:25109184c71bdad752c8312a8623239686a9a2071e8825f20acb8f2198c3f659
   => [internal] load build context
   => => transferring context: 6.33kB
   => CACHED [2/5] WORKDIR /basic-flask-app
   => [3/5] COPY .
   => [4/5] RUN apk add --no-cache python3 py3-pip
   => [5/5] RUN pip install flask --break-system-packages
   => exporting to image
   => => exporting layers
   => => exporting manifest sha256:20f72e99a86c23a799729c4b57bcefdd6fa267a1fff17cf18d482c04689bd27e
   => => exporting config sha256:3c31eaad18be2cedfdcb01d0be1da44695b3ab8832cb20fb67544d335d20e130
   => => exporting attestation manifest sha256:9b425b13bbd958ec7c1ee67137e212598ae9405d54596a0619ad3df0de5a9fdc
   => => exporting manifest list sha256:b47c6bc80d0de4e22cff6ef3f3afbbAAF812b376b7a251ceb40015d43bbb61da
   => => naming to docker.io/tasneemadel/basic-flask-app:latest
   => => unpacking to docker.io/tasneemadel/basic-flask-app:latest
   => => untagging docker.io/tasneemadel/basic-flask-app:latest
[root@serverb basic-flask-app]#
```

Building the image from the dockerfile.

```
[root@serverb basic-flask-app]# docker run --name flask-app -p 80:5000 --memory="100m" tasneemadel/basic-flask-app:latest
 * Serving Flask app 'routes'
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5000
 * Running on http://172.17.0.2:5000
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 185-591-003

```

Creating a container from the image.



The tiger page loads successfully on port 80 from the host.

A screenshot of a Docker Hub account page for the user "tasneemadel". The page shows a single repository named "tasneemadel/python_app", which was last pushed about 2 years ago and is a public image. The sidebar on the left shows the user's profile picture and links to Repositories, Hardened Images, Collaborations, Settings, Default privacy, Notifications, Billing, and Usage.

Dockerhub account is created.

```
[root@serverb basic-flask-app]# docker login

USING WEB-BASED LOGIN

I Info → To sign in with credentials on the command line, use 'docker login -u <username>'

Your one-time device confirmation code is: QGTK-HTTX
Press ENTER to open your browser or submit your device code here: https://login.docker.com/activate

Waiting for authentication in the browser...

WARNING! Your credentials are stored unencrypted in '/root/.docker/config.json'.
Configure a credential helper to remove this warning. See
https://docs.docker.com/go/credential-store/

Login Succeeded
[root@serverb basic-flask-app]#
```

Logged into the account successfully.

```
[root@serverb basic-flask-app]# docker push tasneemadel/basic-flask-app:latest
The push refers to repository [docker.io/tasneemadel/basic-flask-app]
08634a37813b: Pushed
589002ba0eae: Mounted from library/nginx
e19959d4eeeb: Pushed
e80c6a38a12e: Pushed
1fce7f734d8e: Pushed
75a963d33c55: Pushed
latest: digest: sha256:b47c6bc80d0de4e22cff6ef3f3afbbAAF812b376b7a251ceb40015d43bbb61da size: 856
[root@serverb basic-flask-app]#
```

The screenshot shows the Docker Hub 'My Hub' interface. On the left, there's a sidebar with navigation links: 'Explore', 'My Hub' (which is active), 'Repositories' (selected), 'Hardened Images', 'Collaborations', 'Settings' (with 'Default privacy' and 'Notifications' dropdowns), 'Billing', 'Usage' (with 'Pulls' and 'Storage' dropdowns), and 'Create a repository'. The main area is titled 'Repositories' and displays two entries: 'tasneemadel/basic-flask-app' (pushed 1 minute ago) and 'tasneemadel/python_app' (pushed about 2 years ago). A search bar at the top right says 'Search Docker Hub'.

Name	Last Pushed	Contains	Visibility	Scout
tasneemadel/basic-flask-app	1 minute ago	IMAGE	Public	Inactive
tasneemadel/python_app	about 2 years ago	IMAGE	Public	Inactive

The flask image has been added successfully.

Task2:

```
[root@serverb basic-flask-app]# docker network create --subnet=10.0.0.0/8 iti-network  
a48c10fb3d45bbab689051922bc7a724b99c6f407317c646fccde792ffe91d14  
[root@serverb basic-flask-app]#
```

Creating the iti-network.

```
[root@serverb ~]# cat webserver-iti/Dockerfile  
From httpd  
  
RUN sed -i 's/Listen 80/Listen 8080/' /usr/local/apache2/conf/httpd.conf  
[root@serverb ~]#
```

Docker file is created to change the port 80 to 8080 in the configuration of httpd using the sed tool.

```
[root@serverb webserver-iti]# docker build -t webserver-iti-im .  
[+] Building 0.9s (6/6) FINISHED  
=> [internal] load build definition from Dockerfile  
=> => transferring dockerfile: 182B  
=> WARN: ConsistentInstructionCasing: Command 'From' should match the case of the command majority (uppercase) (line 1)  
=> [internal] load metadata for docker.io/library/httpd:latest  
=> [internal] load .dockerrcignore  
=> => transferring context: 2B  
=> [1/2] FROM docker.io/library/httpd:latest@sha256:96b1e8f69ee3adde956e819f7a7c3e706edef7ad88a26a491734015e5c595333  
=> => resolve docker.io/library/httpd:latest@sha256:96b1e8f69ee3adde956e819f7a7c3e706edef7ad88a26a491734015e5c595333  
=> CACHED [2/2] RUN sed -i 's/Listen 80/Listen 8080/' /usr/local/apache2/conf/httpd.conf  
=> exporting to image  
=> => exporting layers  
=> => exporting manifest sha256:c79bb58d2ab32af1b65e59f81d1f4bb737bb98f540ae945bd3988fae57ea10e3  
=> => exporting config sha256:0af03aa9fc2463c5f540a5cf554f09f16a469dd9ce2c113b2d83b0acf105242  
=> => exporting attestation manifest sha256:c2228e72b34057b092c9b9d301f06416a71ed12f4fad09bc584591e4b55ac1f  
=> => exporting manifest list sha256:8acef0fa3418032e15fc234beecd400da984c0fdc8f8ed23a4c9cd7d6b73f14  
=> => naming to docker.io/library/webserver-iti-im:latest  
=> => unpacking to docker.io/library/webserver-iti-im:latest  
  
1 warning found (use docker --debug to expand):  
- ConsistentInstructionCasing: Command 'From' should match the case of the command majority (uppercase) (line 1)
```

Building the image.

```
[root@serverb webserver-iti]# docker run --name webserver-iti -p 8080:8080 --network iti-network -v ./index.html:/usr/local/apache2/htdocs/index.html webserver-iti-im  
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 10.0.0.2. Set the 'ServerName' directive globally to suppress this message  
AH00558: httpd: Could not reliably determine the server's fully qualified domain name, using 10.0.0.2. Set the 'ServerName' directive globally to suppress this message  
[Sat Feb 28 07:42:15.188972 2026] [mpm_event:notice] [pid 1:tid 1] AH00489: Apache/2.4.66 (Unix) configured -- resuming normal operations  
[Sat Feb 28 07:42:15.192972 2026] [core:notice] [pid 1:tid 1] AH00094: Command line: 'httpd -D FOREGROUND'  
10.0.0.1 -- [28/Feb/2026:07:44:21 +0000] "GET / HTTP/1.1" 200 34  
10.0.0.1 -- [28/Feb/2026:07:44:21 +0000] "GET /favicon.ico HTTP/1.1" 404 236
```

Running the container and testing the site.



The site is working successfully.