

FINAL REPORT

SGA2 – Software Development Practices

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QUESTION 1 — GIT & GITHUB

2.1 (1a) Local Git Repository Setup

A simple static website was created with index.html, about.html, contact.html, and style.css.

Git was initialized using:

```
git init
```

2.2 (1b) Demonstration of Git Commands

Commands demonstrated:

```
git status
```

```
git add .
```

```
git commit -m "Initial commit"
```

```
git log --oneline -n 3
```

```
git branch feature/update-readme
```

```
git switch feature/update-readme
```

```
git switch main
```

2.3 (1c) GitHub Integration

The repository was created in GitHub and connected via:

```
git remote add origin <repo-url>
```

```
git push -u origin main
```

GitHub Repository Link:

<https://github.com/ashfaaqkt/devops-assignment-starter>

QUESTION 2 — DOCKER

1.1 (2a) Custom Docker Image

A Python Flask application was created to print:

```
Hello, World! 🚀 (served from a Docker container)
```

Dockerfile used:

```
FROM python:3.12-slim
```

```
WORKDIR /app
```

```
RUN python -m pip install --upgrade pip && python -m pip install flask==3.0.3 --no-cache-dir
```

```
COPY app.py /app/app.py
```

```
EXPOSE 8080
```

```
CMD ["python", "app.py"]
```

1.2 (2b) Build the Docker Image

The Docker image was built using:

```
docker build --no-cache -t ashfaaqkt/hello-app:1.0 .
```

1.3 (2c) Push the Image to Docker Hub

Commands:

```
docker login
```

```
docker tag ashfaaqkt/hello-app:1.0 ashfaaqkt/hello-app:latest
```

```
docker push ashfaaqkt/hello-app:1.0
```

```
docker push ashfaaqkt/hello-app:latest
```

Docker Hub Link:

<https://hub.docker.com/repository/docker/ashfaaqkt/hello-app>

2.4 (2d) Run the Container Locally

Commands:

```
docker run -d -p 8080:8080 --name hello1 ashfaaqkt/hello-app:1.0
```

```
docker ps
```

Application accessed at:

<http://localhost:8080>

Conclusion

This assignment successfully demonstrates Git version control, GitHub integration, Docker image creation, containerization, and running a web application inside a Docker container. These are key DevOps principles used in modern CI/CD workflows.

Screenshots

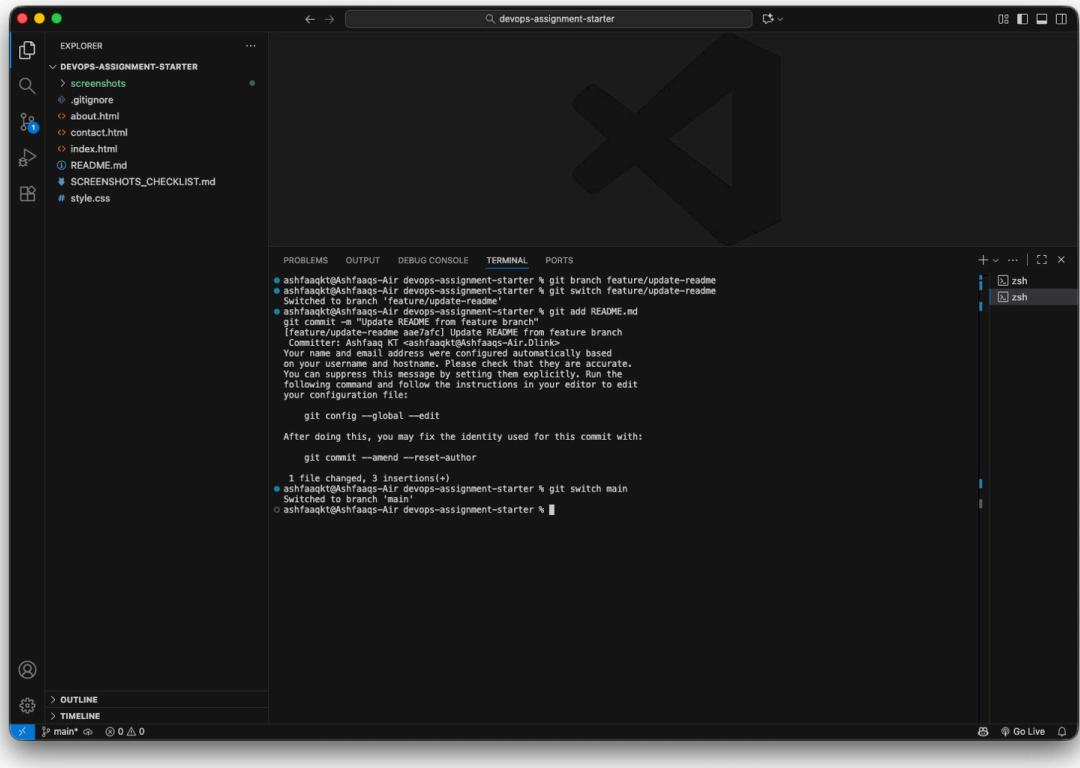
Screenshots is available in individual folder also for better view

Q1a – Git Init & Status

The screenshot shows a terminal window with the following command history:

```
git commit -m "Initial commit: add 3-page static site"
[detached HEAD -- no local refs] git commit: add 3-page static site
%
```

Q1b – Git Add & Commit

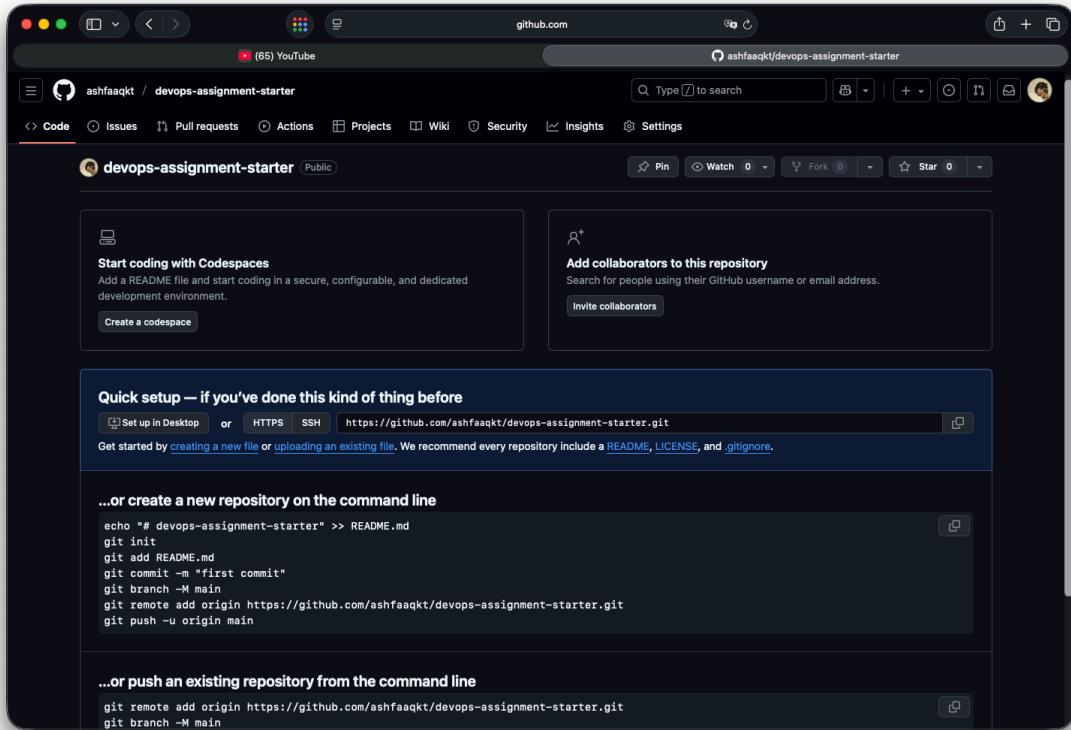


The screenshot shows the Visual Studio Code interface with a terminal window open. The terminal shows the following command-line session:

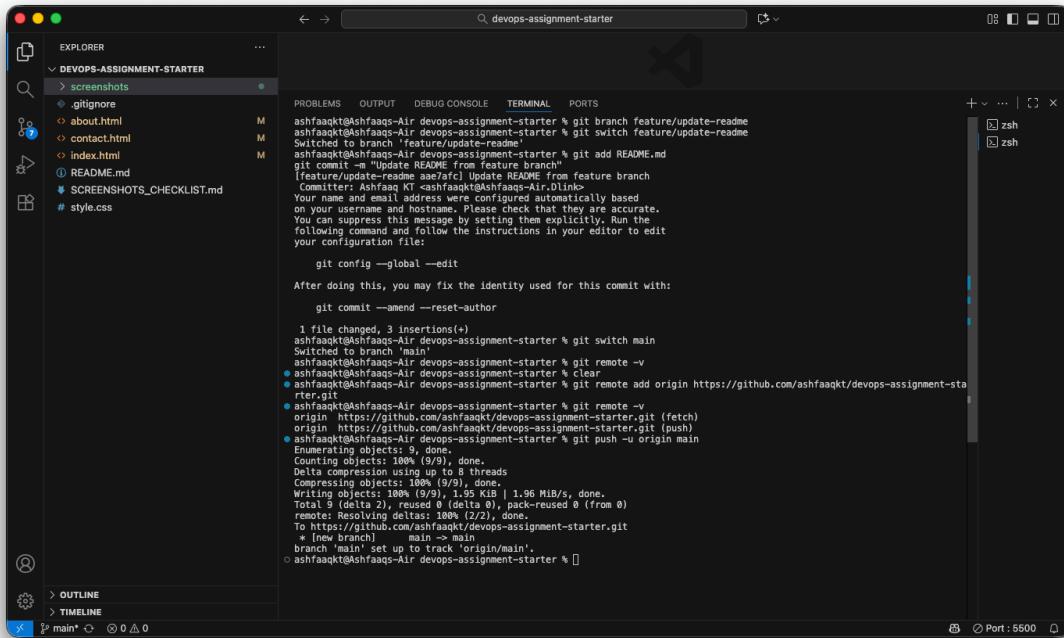
```
ashfaaqt@Ashfaaq-Air devops-assignment-starter % git branch feature/update-readme
Switched to branch 'feature/update-readme'
ashfaaqt@Ashfaaq-Air devops-assignment-starter % git switch feature/update-readme
Switched to branch 'feature/update-readme'
ashfaaqt@Ashfaaq-Air devops-assignment-starter % git add README.md
git commit -m "Update README from feature branch"
[feature/update-readme aae7afc] Update README from feature branch
 1 file changed, 3 insertions(+)
ashfaaqt@Ashfaaq-Air devops-assignment-starter % git switch main
Switched to branch 'main'
ashfaaqt@Ashfaaq-Air devops-assignment-starter %
```

The terminal also displays a warning message about commit author information being automatically based on the user's name and host name.

Q1c – GitHub Repo Page



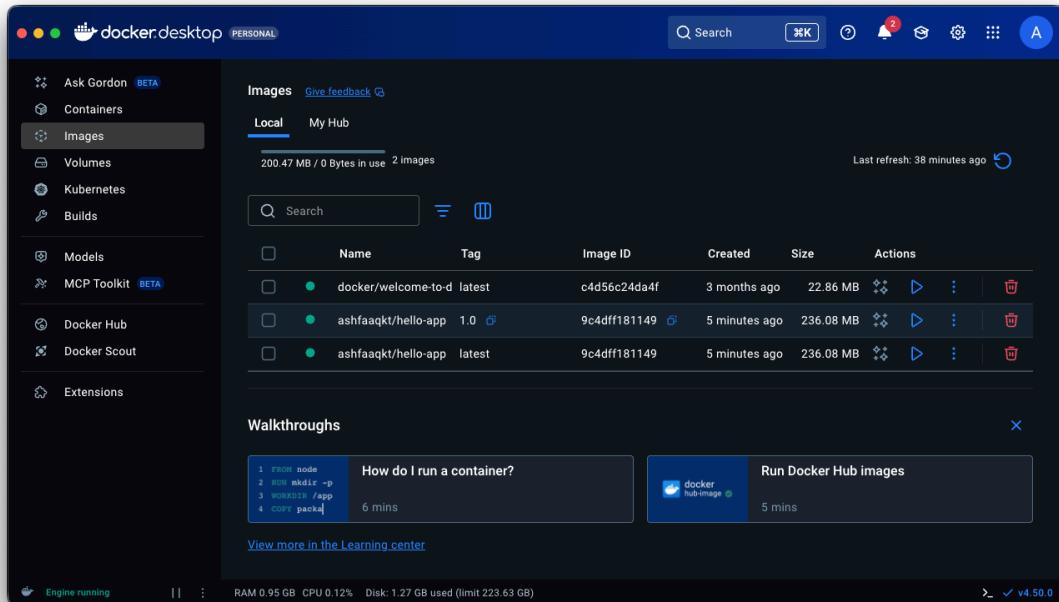
Q1c – Remote Verification



The screenshot shows a terminal window within a code editor interface. The terminal is running on a Mac OS X system, indicated by the window title bar and dock icons. The command line shows a series of git commands being run:

```
ashfaaqkt@ashfaaqts-Air devops-assignment-starter % git branch feature/update-readme
Switched to branch 'feature/update-readme'
ashfaaqkt@ashfaaqts-Air devops-assignment-starter % git add README.md
[feature/update-readme aae/aefc] Update README from feature branch
  Committer: Ashfaq Aqit <ashfaaqkt@Ashfaaqts-Air.blink-
  Your name and email address were configured automatically based
  on your GitHub account. Please check that they are accurate.
  You can suppress this message by setting them explicitly. Run the
  following command and follow the instructions in your editor to edit
  your configuration file:
  git config --global --edit
After doing this, you may fix the identity used for this commit with:
  git commit --amend --reset-author
  1 file changed, 3 insertions(+)
  ashfaaqkt@ashfaaqts-Air devops-assignment-starter % git switch main
  Switched to branch 'main'
  ashfaaqkt@ashfaaqts-Air devops-assignment-starter % git remote -v
  ashfaaqkt@ashfaaqts-Air devops-assignment-starter % clear
  ashfaaqkt@ashfaaqts-Air devops-assignment-starter % git remote add origin https://github.com/ashfaaqkt/devops-assignment-starter.git
  ashfaaqkt@ashfaaqts-Air devops-assignment-starter % git push -u origin main
  Counting objects: 100% (9/9), done.
  Delta compression using up to 8 threads
  Compressing objects: 100% (9/9), done.
  Writing objects: 100% (9/9), 1.96 MiB/s, done.
  total 9 (delta 2), reused 0 (delta 0), pack-reused 0 (from 0)
  remote: Resolving deltas: 100% (2/2), done.
  To https://github.com/ashfaaqkt/devops-assignment-starter.git
    * [new branch]  main -> main
      branch 'main' set up to track 'origin/main'.
  ashfaaqkt@ashfaaqts-Air devops-assignment-starter %
```

Docker Hub Repository



Docker Login Confirmation

The screenshot shows a terminal window within a development environment. The terminal output is as follows:

```
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$ docker build --no-cache -t ashfaaqkt/hello-app:1.0 .
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$ docker run -d -p 8080:8080 --name hello1 ashfaaqkt/hello-app:1.0
528ec01979756217dd2a025349801239a447bc35d9f083b56e9e95118814f58
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$ docker ps --filter "name=hello1"
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS
528ec0197975       ashfaaqkt/hello-app:1.0   "python app.py"   10 seconds ago   Up 9 seconds   0.0.0.0:8080->8080/tcp, [::]:8080->8080/tcp
he
llo1
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$ docker login
Authenticating with existing credentials... [Username: ashfaaqkt]
Info - To login with a different account, run 'docker logout' followed by 'docker login'

Login Succeeded
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$ docker tag ashfaaqkt/hello-app:1.0 ashfaaqkt/hello-app:latest
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$ docker push ashfaaqkt/hello-app:latest
The push refers to repository [docker.io/ashfaaqkt/hello-app]
d69c9413e565: Pushed
252955ba32c6: Pushed
de69e752ea80: Pushed
9136e0406880: Pushed
bb68571b0618: Pushed
252955ba32c8: Pushed
d1fbba5a1772: Pushed
0a9353170639: Pushed
1.0: digest: sha256:101149fcac19d8ad5cb9157f65df5c89b14d28f5aa6633170f6fc59177 size: 856
This push refers to repository [docker.io/ashfaaqkt/hello-app]
d69e752ea80: Layer already exists
51365f040688: Layer already exists
0a9353170639: Layer already exists
bb68571b0618: Layer already exists
252955ba32c8: Layer already exists
d1fbba5a1772: Layer already exists
7f7533351772: Layer already exists
latest: digest: sha256:101149fcac19d8ad5cb9157f65df5c89b14d28f5aa6633170f6fc59177 size: 856
ashfaaqkt@ashfaaqs-Air:~/devops-assignment-starter$
```

Docker Images List

The screenshot shows the Docker Desktop application interface. The left sidebar has a dark theme with white icons and text. The 'Images' option is selected, highlighted with a blue background. The main area is titled 'Images' with a 'Local' tab selected and a 'My Hub' tab. It shows two images: 'docker/welcome-to-d' (latest tag) and 'ashfaaqkt/hello-app' (1.0 tag). A search bar is at the top, followed by a table with columns: Name, Tag, Image ID, Created, Size, and Actions. Below the table is a 'Walkthroughs' section with two cards: 'How do I run a container?' and 'Run Docker Hub images'. The bottom status bar shows 'Engine running', system resources (RAM 0.96 GB, CPU 0.25%), and disk usage (limit 223.63 GB). The version 'v4.50.0' is also visible.

Name	Tag	Image ID	Created	Size	Actions
docker/welcome-to-d	latest	c4d56c24da4f	3 months ago	22.86 MB	
ashfaaqkt/hello-app	1.0	9c4dff181149	1 minute ago	236.08 MB	

Walkthroughs

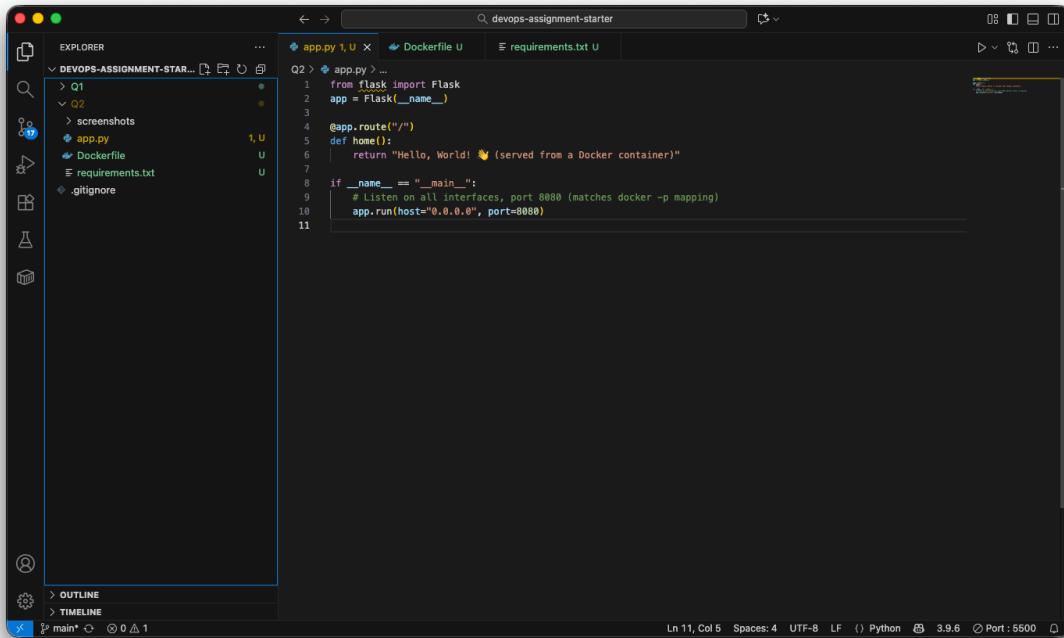
How do I run a container?
1 FROM node
2 RUN mkdir -p /app
3 WORKDIR /app
4 COPY package.json .

Run Docker Hub images

View more in the Learning center

Engine running | RAM 0.96 GB CPU 0.25% Disk: 1.27 GB used (limit 223.63 GB) v4.50.0

Q2a – Flask App Code



The screenshot shows a dark-themed code editor interface with the following details:

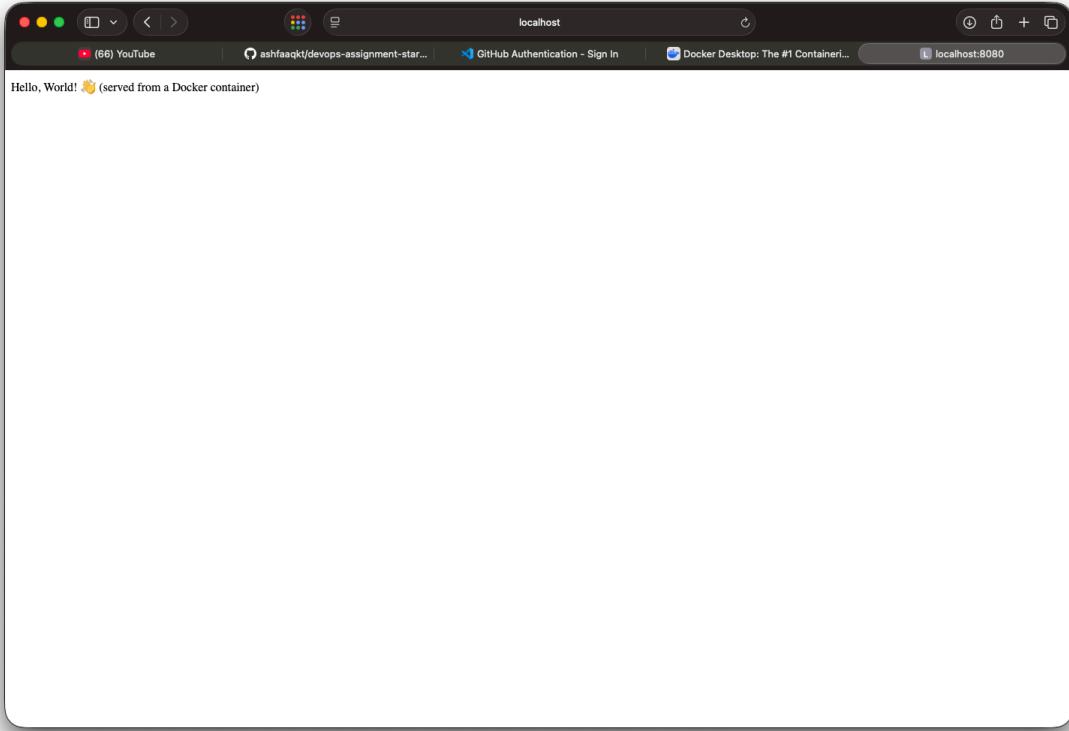
- Explorer View:** Shows a project structure for "DEVOPS-ASSIGNMENT-STAR...". It includes a folder "Q1" containing "screenshots", a folder "Q2" containing "app.py", "Dockerfile", and "requirements.txt", and a file ".gitignore".
- Code Editor:** The active tab is "app.py". The code content is as follows:

```
Q2 > app.py 1, U  Dockerfile U requirements.txt U
1 from flask import Flask
2 app = Flask(__name__)
3
4 @app.route("/")
5 def home():
6     return "Hello, World! 🌎 (served from a Docker container)"
7
8 if __name__ == "__main__":
9     # Listen on all interfaces, port 8000 (matches docker -p mapping)
10    app.run(host="0.0.0.0", port=8000)
```

- Status Bar:** Shows "Ln 11, Col 5" and other system information.

Q2b – Dockerfile Build

Application Running in Browser



The END