Unit 4.4 : Assignment

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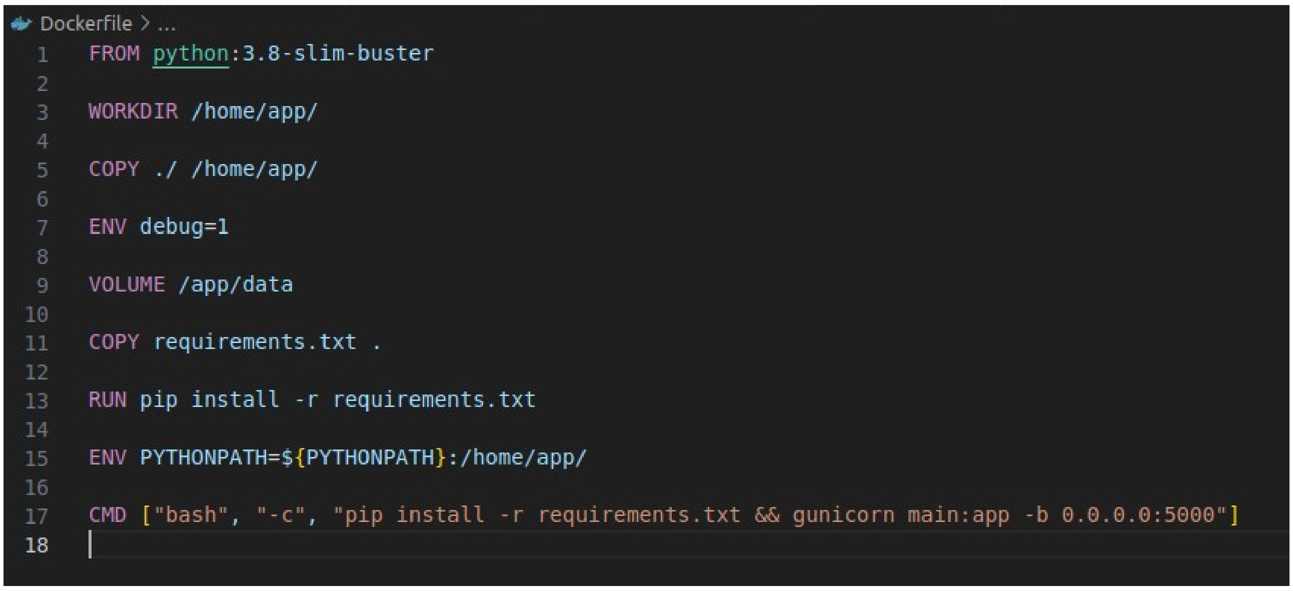
Task:

Browse to: tasks/4_microservices_development/day_4_best_practices/ app_that_doesnt_follow_best_practices/ analyze the application - which microservice best practices it doesn't follow? Think about what needs to be improved first. Have a look at the areas_for_improvement.txt file for hints. Improve the application.

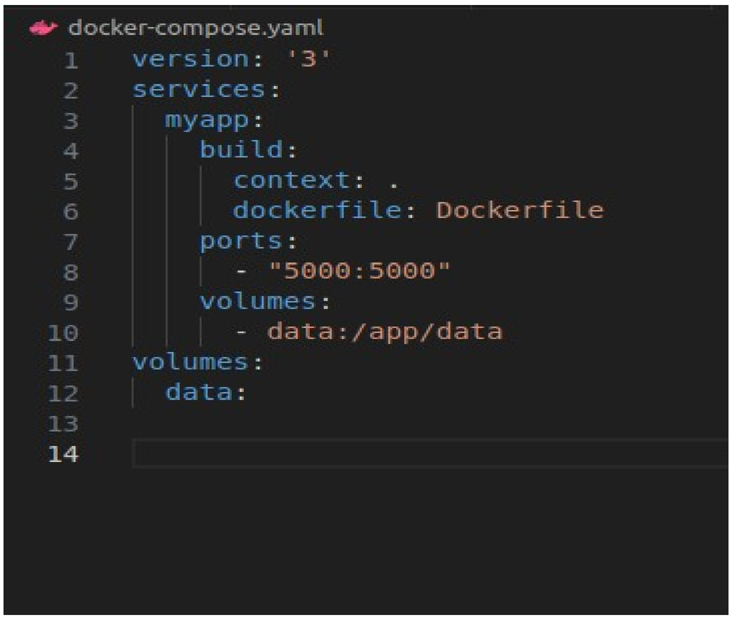
Solution:



Dockerfile > ...

```dockerfile
FROM python:3.8-slim-buster

WORKDIR /home/app/

COPY ./ /home/app/

ENV debug=1

VOLUME /app/data

COPY requirements.txt .

RUN pip install -r requirements.txt

ENV PYTHONPATH=${PYTHONPATH}:/home/app/

CMD ["bash", "-c", "pip install -r requirements.txt && gunicorn main:app -b 0.0.0.0:5000"]

```

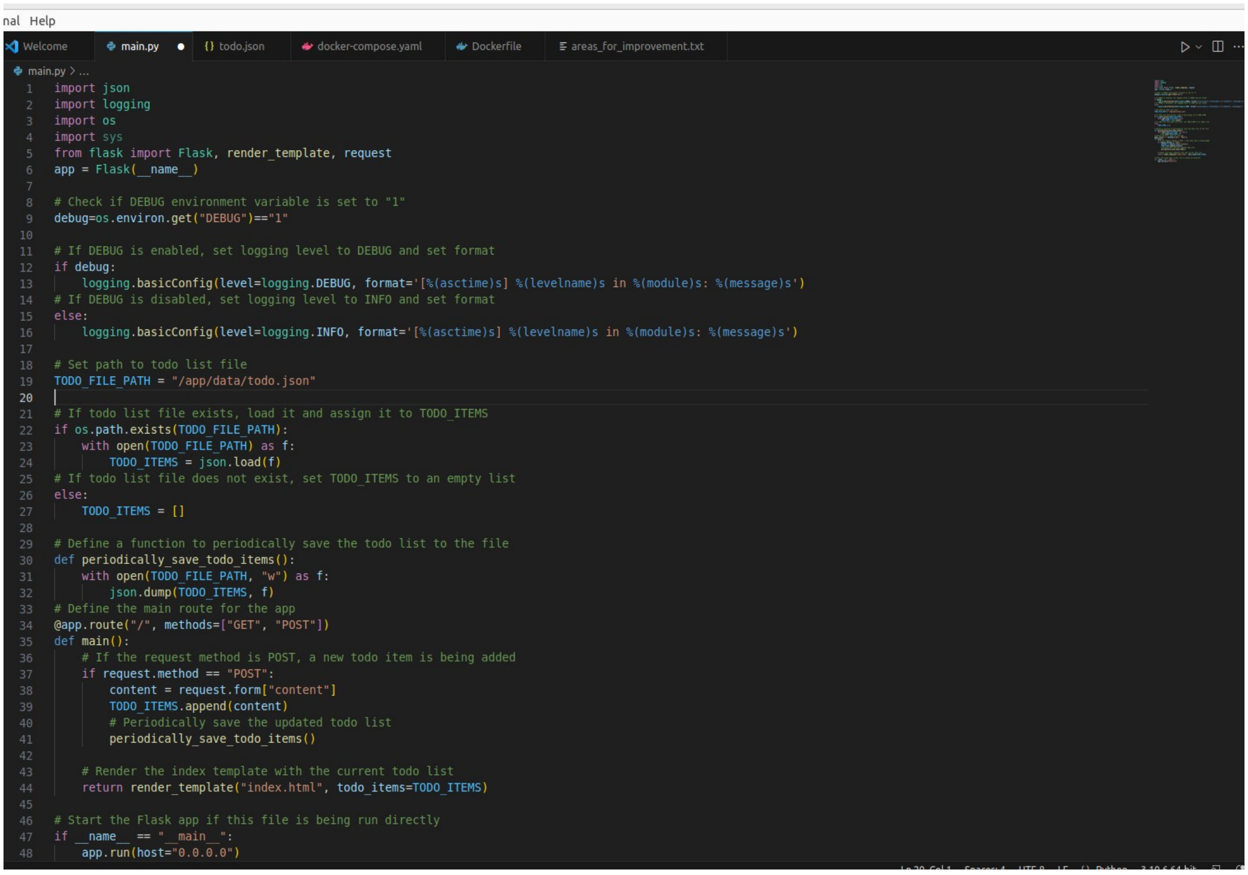
This Dockerfile we specifies the instructions to build a Docker image that includes a Python 3.8 runtime environment, copies the contents of the current directory into the /home/app/ directory within the container, installs Python dependencies specified in requirements.txt file, sets some environment variables and defines a command to be executed when the container starts.



```yaml
version: '3'
services:
  myapp:
    build:
      context: .
      dockerfile: Dockerfile
    ports:
      - "5000:5000"
    volumes:
      - data:/app/data
volumes:
  data:

```

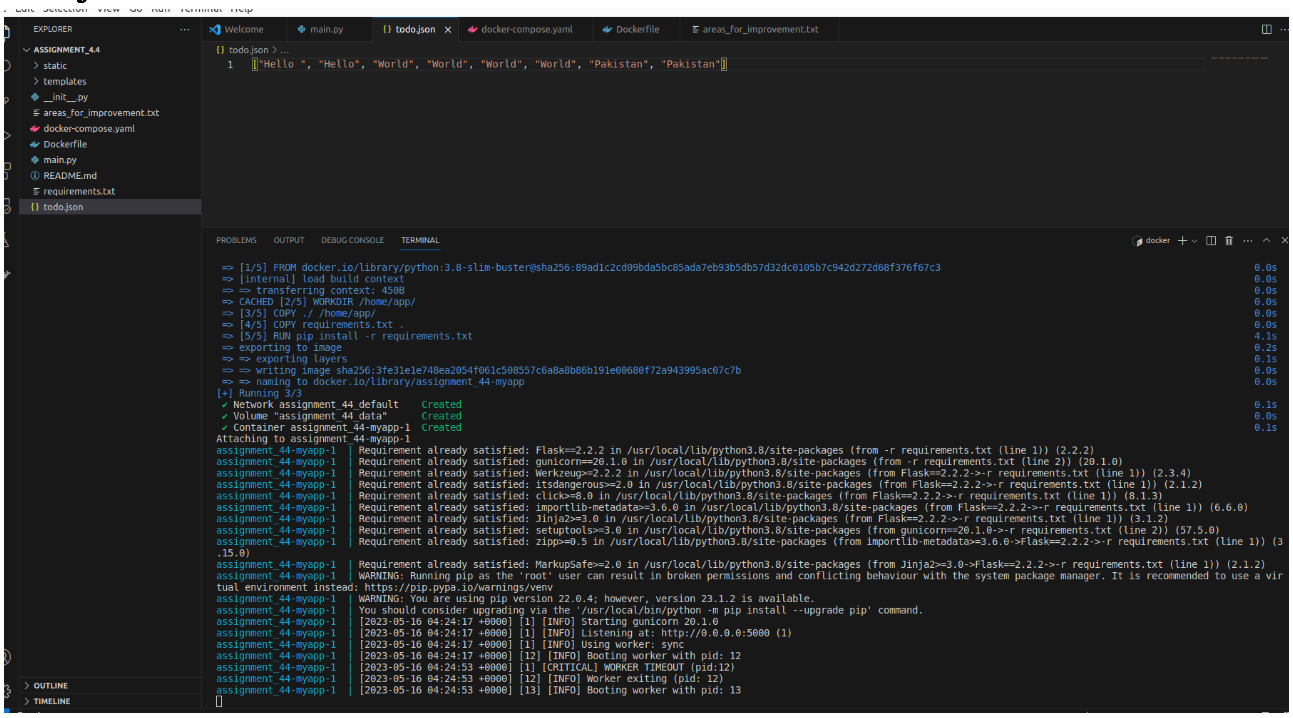
This Docker Compose file we defines a single service named "myapp". This service is based on a Docker image built from a Dockerfile located in the same directory as the Compose file.The service is configured to expose port 5000 on the host, which is mapped to port 5000 on the container. This means that the application running inside the container can be accessed via http://localhost:5000.

main.py



```python
import json
import logging
import os
import sys
from flask import Flask, render_template, request
app = Flask(__name__)

# Check if DEBUG environment variable is set to "1"
debug=os.environ.get("DEBUG")=="1"

# If DEBUG is enabled, set logging level to DEBUG and set format
if debug:
    logging.basicConfig(level=logging.DEBUG, format='[%(asctime)s] %(levelname)s in %(module)s: %(message)s')
# If DEBUG is disabled, set logging level to INFO and set format
else:
    logging.basicConfig(level=logging.INFO, format='[%(asctime)s] %(levelname)s in %(module)s: %(message)s')

# Set path to todo list file
TODO_FILE_PATH = "/app/data/todo.json"

# If todo list file exists, load it and assign it to TODO_ITEMS
if os.path.exists(TODO_FILE_PATH):
    with open(TODO_FILE_PATH) as f:
        TODO_ITEMS = json.load(f)
# If todo list file does not exist, set TODO_ITEMS to an empty list
else:
    TODO_ITEMS = []

# Define a function to periodically save the todo list to the file
def periodically_save_todo_items():
    with open(TODO_FILE_PATH, "w") as f:
        json.dump(TODO_ITEMS, f)
# Define the main route for the app
@app.route("/", methods=["GET", "POST"])
def main():
    # If the request method is POST, a new todo item is being added
    if request.method == "POST":
        content = request.form["content"]
        TODO_ITEMS.append(content)
        # Periodically save the updated todo list
        periodically_save_todo_items()

    # Render the index template with the current todo list
    return render_template("index.html", todo_items=TODO_ITEMS)

# Start the Flask app if this file is being run directly
if __name__ == "__main__":
    app.run(host="0.0.0.0")
```

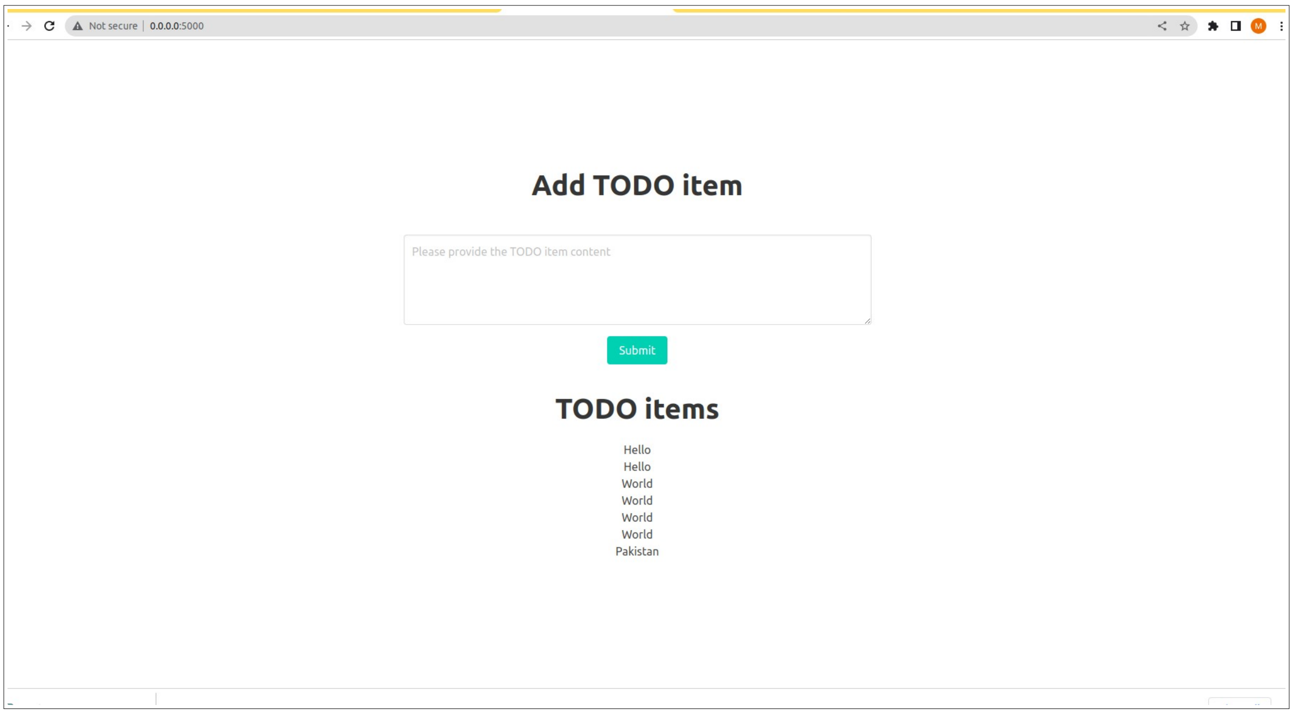
todo.json



```json
["Hello ", "Hello", "World", "World", "World", "World", "Pakistan", "Pakistan"]
```

```
 => [1/5] FROM docker.io/library/python:3.8-slim-buster@sha256:89ad1c2cd09bda5bc85ada7eb93b5db57d32dc0105b7c942d272d68f376f67c3                    0.0s
 => [internal] load build context                                                                                                                0.0s
 => => transferring context: 450B                                                                                                                0.0s
 => CACHED [2/5] WORKDIR /home/app/                                                                                                              0.0s
 => [3/5] COPY ./ /home/app/                                                                                                                     0.0s
 => [4/5] COPY requirements.txt .                                                                                                                0.0s
 => [5/5] RUN pip install -r requirements.txt                                                                                                    4.1s
 => exporting to image                                                                                                                           0.2s
 => => exporting layers                                                                                                                          0.1s
 => => writing image sha256:3fe31e1e748ea2054f061c508557c6a8a8b86b191e00680f72a943995ac07c7b                                                     0.0s
 => => naming to docker.io/library/assignment_44-myapp                                                                                           0.0s
[+] Running 3/3
 ✔ Network assignment_44_default    Created                                                                                                      0.1s
 ✔ Volume "assignment_44_data"      Created                                                                                                      0.0s
 ✔ Container assignment_44-myapp-1  Created                                                                                                      0.1s
Attaching to assignment_44-myapp-1
assignment_44-myapp-1  | Requirement already satisfied: Flask==2.2.2 in /usr/local/lib/python3.8/site-packages (from -r requirements.txt (line 1)) (2.2.2)
assignment_44-myapp-1  | Requirement already satisfied: gunicorn==20.1.0 in /usr/local/lib/python3.8/site-packages (from -r requirements.txt (line 2)) (20.1.0)
assignment_44-myapp-1  | Requirement already satisfied: Werkzeug>=2.2.2 in /usr/local/lib/python3.8/site-packages (from Flask==2.2.2->-r requirements.txt (line 1)) (2.3.4)
assignment_44-myapp-1  | Requirement already satisfied: itsdangerous>=2.0 in /usr/local/lib/python3.8/site-packages (from Flask==2.2.2->-r requirements.txt (line 1)) (2.1.2)
assignment_44-myapp-1  | Requirement already satisfied: click>=8.0 in /usr/local/lib/python3.8/site-packages (from Flask==2.2.2->-r requirements.txt (line 1)) (8.1.3)
assignment_44-myapp-1  | Requirement already satisfied: importlib-metadata>=3.6.0 in /usr/local/lib/python3.8/site-packages (from Flask==2.2.2->-r requirements.txt (line 1)) (6.6.0)
assignment_44-myapp-1  | Requirement already satisfied: Jinja2>=3.0 in /usr/local/lib/python3.8/site-packages (from Flask==2.2.2->-r requirements.txt (line 1)) (3.1.2)
assignment_44-myapp-1  | Requirement already satisfied: setuptools>=3.0 in /usr/local/lib/python3.8/site-packages (from gunicorn==20.1.0->-r requirements.txt (line 2)) (57.5.0)
assignment_44-myapp-1  | Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.8/site-packages (from importlib-metadata>=3.6.0->Flask==2.2.2->-r requirements.txt (line 1)) (3
.15.0)
assignment_44-myapp-1  | Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.8/site-packages (from Jinja2>=3.0->Flask==2.2.2->-r requirements.txt (line 1)) (2.1.2)
assignment_44-myapp-1  | WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a vir
tual environment instead: https://pip.pypa.io/warnings/venv
assignment_44-myapp-1  | WARNING: You are using pip version 22.0.4; however, version 23.1.2 is available.
assignment_44-myapp-1  | You should consider upgrading via the '/usr/local/bin/python -m pip install --upgrade pip' command.
assignment_44-myapp-1  | [2023-05-16 04:24:17 +0000] [1] [INFO] Starting gunicorn 20.1.0
assignment_44-myapp-1  | [2023-05-16 04:24:17 +0000] [1] [INFO] Listening at: http://0.0.0.0:5000 (1)
assignment_44-myapp-1  | [2023-05-16 04:24:17 +0000] [1] [INFO] Using worker: sync
assignment_44-myapp-1  | [2023-05-16 04:24:17 +0000] [12] [INFO] Booting worker with pid: 12
assignment_44-myapp-1  | [2023-05-16 04:24:53 +0000] [1] [CRITICAL] WORKER TIMEOUT (pid:12)
assignment_44-myapp-1  | [2023-05-16 04:24:53 +0000] [12] [INFO] Worker exiting (pid: 12)
assignment_44-myapp-1  | [2023-05-16 04:24:53 +0000] [13] [INFO] Booting worker with pid: 13
```

Output



Add TODO item

TODO items

Hello
Hello
World
World
World
World
Pakistan