To accomplish the mandatory features and additional tasks for your application, you'll need to follow these steps:

1. **Create a Dockerfile for your application**: This file will define the environment and dependencies needed to run your application.
2. **Build a Docker image for your application**: Use the Dockerfile to build an image that contains your application code and dependencies.
3. **Run MongoDB in a separate Docker container**: You can either use a public Docker image for MongoDB or create your own Docker image.
4. **Expose ports**: Ensure that the MongoDB container exposes its port for your application to access, and expose the HTTP port in your application container.
5. **Secure MongoDB with a username and password**: Set up authentication for your MongoDB instance.
6. **Pass credentials via environment variables**: Instead of hardcoding credentials, provide them to your application container at runtime using environment variables.

Here's a basic guide on how to achieve this:

**Dockerfile for your application:**

DockerfileCopy code

# Use an appropriate base image FROM python:3.9 # Set working directory WORKDIR /app # Copy requirements.txt first to leverage Docker cache COPY requirements.txt . # Install dependencies RUN pip install -r requirements.txt # Copy the rest of the application code COPY . . # Expose the port your app runs on EXPOSE 8000 # Command to run the application CMD ["python", "app.py"]

**Build Docker image for your application:**

Copy code

docker build -t myapp .

**Run MongoDB in a separate container:**

arduinoCopy code

docker run -d --name mymongodb mongo

**Run your application container and link it to MongoDB container:**

cssCopy code

docker run -d --name myapp --link mymongodb:mongodb -p 8000:8000 myapp

**Secure MongoDB with username and password:** Refer to MongoDB documentation for setting up authentication.

**Pass credentials via environment variables:**

bashCopy code

docker run -d --name mymongodb -e MONGO\_INITDB\_ROOT\_USERNAME=myrootuser -e MONGO\_INITDB\_ROOT\_PASSWORD=myrootpassword mongo

bashCopy code

docker run -d --name myapp --link mymongodb:mongodb -p 8000:8000 -e MONGO\_USERNAME=myrootuser -e MONGO\_PASSWORD=myrootpassword myapp

Ensure that your application code reads these environment variables (**MONGO\_USERNAME**, **MONGO\_PASSWORD**) to connect to MongoDB.

By following these steps, you'll have your entire application running in Docker containers with the specified requirements and additional tasks completed