Detailed Deployment Guide: FastAPI Application on Azure Container Instances (ACI) Using Azure Interface

Pre-Deployment Steps: Docker Image Preparation

1.Containerize FastAPI App:

- Create a Dockerfile for your FastAPI application.
- Define the steps to build an image incorporating the FastAPI app and its dependencies.

```dockerfile
FROM baseimage

WORKDIR /app

COPY ./requirements.txt /app/requirements.txt
RUN pip install --no-cache-dir -r requirements.txt

COPY ./app /app/app

CMD ["uvicorn", "app.main:app", "--host", "0.0.0.0", "--port", "80"]
```

- Build the Docker image locally:
  ```
  docker build -t <docker-hub-username>/<image-name>:<tag> .
  ```
- Ensure the FastAPI application runs correctly within the Docker container.

2.Push Image to Docker Hub:
- Log in to Docker Hub: `docker login`
- Push the Docker image:

```
docker push <docker-hub-username>/<image-name>:<tag>
```

Deployment Steps: Azure Interface

3. Access Azure Portal:
   - Sign in to portal.azure.com.
4. Resource Group Creation:
   - Navigate to the Resource Groups section.
   - Click "Create" to make a new Resource Group.
   - Name the group and select the desired region.
5. Azure Container Instances (ACI):
   - In the Azure Portal, go to the Azure Container Instances section.
6. Create New Container Instance:
   - Click "Create" to initiate a new Azure Container Instance.
   - Provide the necessary details:
     - Container name, Resource Group (previously created), region, and OS type.
7. Container Configuration - Image Source:
   - In the container settings:
     - Specify the Docker Hub image URL (`<docker-hub-username>/<image-name>:<tag>`) for your FastAPI application.
8. Port Configuration:
   - Set the container port to match your FastAPI application's exposed port (e.g., 8000).
   - Ensure the Azure port matches your FastAPI app's configuration.
9. Environment and Networking Setup:
   - Configure environment variables, networking settings, or container configurations within Azure to align with your FastAPI application's requirements.
10. Deployment Validation:

- Once the container instance is deployed, access the provided endpoint or URL to reach your FastAPI application running on Azure Container Instances.
- Test functionality and accessibility of your application on the specified port.

11. Monitoring and Management:
   - Utilize Azure's monitoring tools within the Resource Group to monitor performance, logs, and potential issues related to your deployed FastAPI application.