# CI/CD with Docker & GitHub Actions

This solution containerizes a .NET Core backend and React frontend, sets up a MongoDB instance, and uses GitHub Actions for CI/CD automation.

## Steps

1. Containerize  
 - Backend: .NET Core API  
 - Frontend: React app  
 - Database: MongoDB  
  
2. Run Locally  
 Run:  
 docker-compose up --build  
 Access:  
 - Frontend → http://localhost:3000  
 - Backend → http://localhost:5000  
  
3. CI/CD Pipeline  
 - Builds and tests backend & frontend  
 - Uses GitHub Actions workflow  
 - Runs docker-compose up on main branch push  
  
Expected Outcome:  
- Backend, frontend, and MongoDB run together via Docker Compose.  
- CI/CD automates build, test, and deployment.

## Backend Dockerfile

FROM mcr.microsoft.com/dotnet/aspnet:6.0 AS base  
WORKDIR /app  
EXPOSE 5000  
  
FROM mcr.microsoft.com/dotnet/sdk:6.0 AS build  
WORKDIR /src  
COPY . .  
RUN dotnet restore  
RUN dotnet build -c Release -o /app/build  
  
FROM build AS publish  
RUN dotnet publish -c Release -o /app/publish  
  
FROM base AS final  
WORKDIR /app  
COPY --from=publish /app/publish .  
ENTRYPOINT ["dotnet", "Backend.dll"]

## Frontend Dockerfile

FROM node:16 as build  
WORKDIR /app  
COPY package\*.json ./  
RUN npm install  
COPY . .  
RUN npm run build  
  
FROM nginx:alpine  
COPY --from=build /app/build /usr/share/nginx/html  
EXPOSE 80  
CMD ["nginx", "-g", "daemon off;"]

## docker-compose.yml

version: '3.8'  
services:  
 backend:  
 build: ./backend  
 ports:  
 - "5000:5000"  
 depends\_on:  
 - mongodb  
 frontend:  
 build: ./frontend  
 ports:  
 - "3000:80"  
 depends\_on:  
 - backend  
 mongodb:  
 image: mongo:latest  
 ports:  
 - "27017:27017"  
 volumes:  
 - mongo-data:/data/db  
  
volumes:  
 mongo-data:

## GitHub Actions Workflow (deploy.yml)

name: CI/CD Pipeline  
  
on:  
 push:  
 branches: [ "main" ]  
  
jobs:  
 build:  
 runs-on: ubuntu-latest  
 steps:  
 - uses: actions/checkout@v3  
  
 - name: Build Backend Docker Image  
 run: docker build ./backend -t my-backend:latest  
  
 - name: Build Frontend Docker Image  
 run: docker build ./frontend -t my-frontend:latest  
  
 - name: Run Backend Tests  
 run: echo "dotnet test backend (placeholder)"  
  
 - name: Run Frontend Tests  
 run: echo "npm test frontend (placeholder)"  
  
 - name: Deploy Locally  
 run: docker-compose up -d --build