

Program 2 : Develop a Multi-Stage Dockerfile for Container Orchestration

Project Structure

program-2/

- > Dockerfile
- > package.json
- > package-lock.json
- > src/ [index.js](#)
- > node_modules (created during npm install)

Step 1 : Create a Dockerfile

```
GNU nano 7.2
#Stage 1:
FROM node:20-alpine AS builder
WORKDIR /app
COPY package.json package-lock.json ./
RUN npm install
COPY . .
RUN npm run build

#Stage 2:
FROM node:20-alpine
WORKDIR /app
COPY --from=builder /app/package.json ./
COPY --from=builder /app/package-lock.json ./
COPY --from=builder /app/dist ./dist
COPY --from=builder /app/node_modules ./node_modules

EXPOSE 3000

CMD ["node", "dist/index.js"]
```

Step 2 : Create folder -> strc and create a file -> [index.js](#)

```
GNU nano 7.2
const express = require('express');
const app = express();
const PORT = 3000;

app.get('/', (req,res)=> {
res.send('Hello from multi-stage Docker!');
});

app.listen(PORT, () => {
console.log(`Server running on port ${PORT}`);
});
```

Step 3 : run npm init -y npm install

The screenshot shows a terminal window on a Linux system (Ubuntu 18.04 LTS) with the following session log:

```
Nov 2 23:23
1rv24mc013_akashj@akash-HP-Laptop-15s-fq5xxx:~/program-2$ nano package-lock.json
1rv24mc013_akashj@akash-HP-Laptop-15s-fq5xxx:~/program-2$ npm install
up to date, audited 69 packages in 1s
16 packages are looking for funding
  run `npm fund` for details
found 0 vulnerabilities
1rv24mc013_akashj@akash-HP-Laptop-15s-fq5xxx:~/program-2$ sudo docker build -t program-2 .
[sudo] password for 1rv24mc013_akashj:
[+] Building 11.3s (15/15) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 440B
=> [internal] load metadata for docker.io/library/node:20-alpine
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [internal] load build context
=> => transferring context: 100.09kB
=> [builder 1/6] FROM docker.io/library/node:20-alpine@sha256:6178e78b972f79c335df281f4b7674a2d85071aae2af020ffa39f0a770265435
=> CACHED [builder 2/6] WORKDIR /app
=> [builder 3/6] COPY package.json package-lock.json .
=> [builder 4/6] RUN npm install
=> [builder 5/6] COPY .
=> [builder 6/6] RUN npm run build
=> [stage-1 3/6] COPY --from=builder /app/package.json .
=> [stage-1 4/6] COPY --from=builder /app/package-lock.json .
=> [stage-1 5/6] COPY --from=builder /app/dist ./dist
=> [stage-1 6/6] COPY --from=builder /app/node_modules ./node_modules
=> exporting to image
=> => exporting layers
=> => writing image sha256:70a5ef9f58b19b1934e96f1d064d0b641f86c894bab35de809e5b3d8ac8cda85
=> => naming to docker.io/library/program-2
1rv24mc013_akashj@akash-HP-Laptop-15s-fq5xxx:~/program-2$ sudo docker run -it -p 3000:3000 program-2
Server running on port 3000
^C
^X
```

Output of the Docker Container on the Host Machine

