

Program 2 : Develop a multi stage docker file for container orchestration.

File structure:

```
/package.json  
/package-lock.json  
/src/index.js  
/node_modules  
/Dockerfile
```

Create package.json and package-lock.json by running following commands

```
npm init -y  
npm install express  
npm install
```

In package.json in the scripts field add following lines

```
"scripts": {  
  "start": "node dist/index.js", //add  
  "build" : "mkdir -p dist && cp -r src/* dist/", // add  
  "test": "echo \"Error: no test specified\" && exit 1"  
},
```

Create docker file and add required docker commands
FROM node:20-alpine AS builder

```
#metadata  
LABEL author="Anantha M"
```

```
#set working dir  
WORKDIR /app
```

```
#copy files  
COPY package.json package-lock.json ./  
RUN npm install
```

```
#copying source code  
COPY . .
```

```
#building application  
RUN npm run build
```

```
#stage 2 production stage  
FROM node:20-alpine
```

```
#set working dir  
WORKDIR /app
```

```
#copying files from build to production stage  
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
```

```
#port  
EXPOSE 3000  
#start
```

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

To create image run the following command

#sudo docker build -t program2 .

To see created image

#sudo docker images

To run contain from existing image

#sudo docker run -it -p 3000:3000 --name pro2 program2

To see all the containers

#sudo docker container ls -a

To check the stage building run the command

#sudo docker history program2

```
1rv24mc016_anantha_m@anantha-ASUS-TUF-Gaming-A15-FA506IHRB-FA506IHRZ:~/Desktop/LabPrograms/Lab2$ sudo docker images
[sudo] password for 1rv24mc016_anantha_m:
REPOSITORY TAG IMAGE ID CREATED SIZE
program1 latest ea1a6d8e2b3a 5 minutes ago 132MB
1rv24mc016_anantha_m@anantha-ASUS-TUF-Gaming-A15-FA506IHRB-FA506IHRZ:~/Desktop/LabPrograms/Lab2$ sudo docker build -t program2 .
[+] building 4.5s (15/15) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 660B
=> [internal] load metadata for docker.io/library/node:20-alpine
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [builder 1/6] FROM docker.io/library/node:20-alpine@sha256:6178e78b972f79c335df281f4b7674a2d85071aae2af020ffa39f0a770265435
=> [internal] load build context
=> => transferring context: 2.70MB
=> CACHED [builder 2/6] WORKDIR /app
=> CACHED [builder 3/6] COPY package.json package-lock.json ./
=> CACHED [builder 4/6] RUN npm install
=> [builder 5/6] COPY . .
=> [builder 6/6] RUN npm run build
=> CACHED [stage-1 3/6] COPY --from=builder /app/package.json ./
=> CACHED [stage-1 4/6] COPY --from=builder /app/package-lock.json ./
=> CACHED [stage-1 5/6] COPY --from=builder /app/dist ./dist
=> CACHED [stage-1 6/6] COPY --from=builder /app/node_modules ./node_modules
=> exporting to image
=> => writing image sha256:89451af3e1a9c59accf81a5f224d4928d39b7c0470962c6f868478e60c819538
=> => naming to docker.io/library/program2
1rv24mc016_anantha_m@anantha-ASUS-TUF-Gaming-A15-FA506IHRB-FA506IHRZ:~/Desktop/LabPrograms/Lab2$ sudo docker images
REPOSITORY TAG IMAGE ID CREATED SIZE
program1 latest ea1a6d8e2b3a 5 minutes ago 132MB
program2 latest 89451af3e1a9 13 hours ago 137MB
1rv24mc016_anantha_m@anantha-ASUS-TUF-Gaming-A15-FA506IHRB-FA506IHRZ:~/Desktop/LabPrograms/Lab2$ sudo docker run -it -p 3000:3000 --name pro2 program2
Server running on http://localhost:3000
]
```

```
1rv24mc016_anantha_m@anantha-ASUS-TUF-Gaming-A15-FA506IHRB-FA506IHRZ:~/Desktop/LabPrograms/Lab2$ sudo docker history program2
[sudo] password for 1rv24mc016_anantha_m:
IMAGE CREATED CREATED BY SIZE COMMENT
89451af3e1a9 13 hours ago CMD ["node" "dist/index.js"] 0B buildkit.dockerfile.v0
<missing> 13 hours ago EXPOSE [3000/tcp] 0B buildkit.dockerfile.v0
<missing> 13 hours ago COPY /app/node_modules ./node_modules # buildkit 2.62MB buildkit.dockerfile.v0
<missing> 13 hours ago COPY /app/dist ./dist # buildkit 225B buildkit.dockerfile.v0
<missing> 13 hours ago COPY /app/package-lock.json ./ # buildkit 29.6kB buildkit.dockerfile.v0
<missing> 13 hours ago COPY /app/package.json ./ # buildkit 359B buildkit.dockerfile.v0
<missing> 13 hours ago WORKDIR /app 0B buildkit.dockerfile.v0
<missing> 2 weeks ago CMD ["node"] 0B buildkit.dockerfile.v0
<missing> 2 weeks ago ENTRYPOINT ["docker-entrypoint.sh"] 0B buildkit.dockerfile.v0
<missing> 2 weeks ago COPY docker-entrypoint.sh /usr/local/bin/ # 388B buildkit.dockerfile.v0
<missing> 2 weeks ago RUN /bin/sh -c apk add --no-cache --virtual 5.37MB buildkit.dockerfile.v0
<missing> 2 weeks ago ENV YARN_VERSION=1.22.22 0B buildkit.dockerfile.v0
<missing> 2 weeks ago RUN /bin/sh -c addgroup -g 1000 node && 121MB buildkit.dockerfile.v0
<missing> 2 weeks ago ENV NODE_VERSION=20.19.5 0B buildkit.dockerfile.v0
<missing> 3 weeks ago CMD ["/bin/sh"] 0B buildkit.dockerfile.v0
<missing> 3 weeks ago ADD alpine-minirootfs-3.22.2-x86_64.tar.gz / 8.32MB buildkit.dockerfile.v0
1rv24mc016_anantha_m@anantha-ASUS-TUF-Gaming-A15-FA506IHRB-FA506IHRZ:~/Desktop/LabPrograms/Lab2$
```