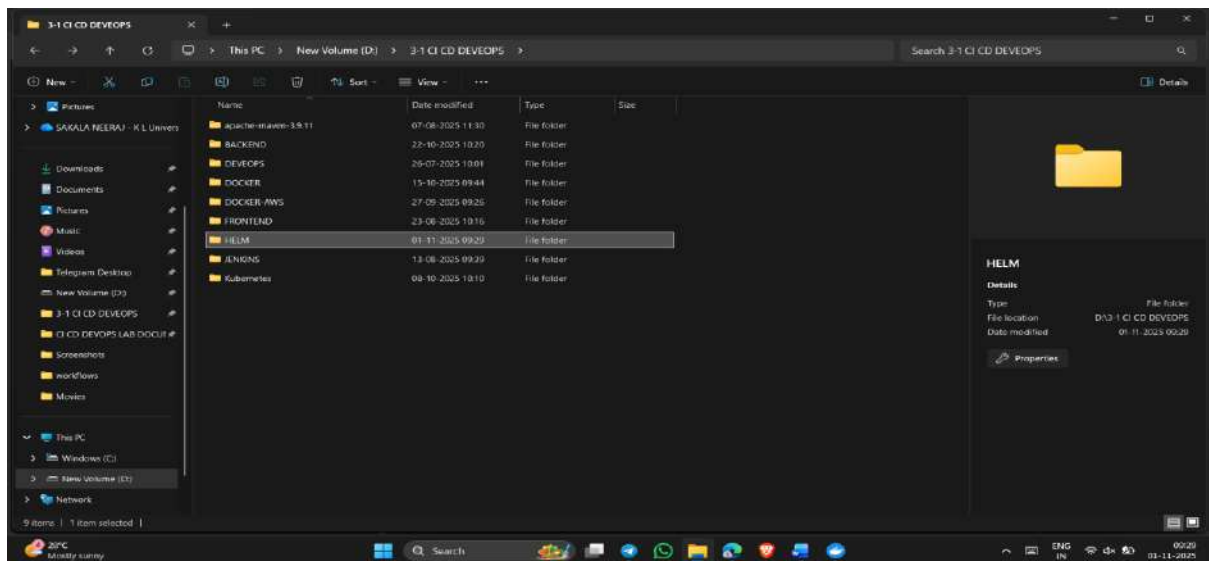
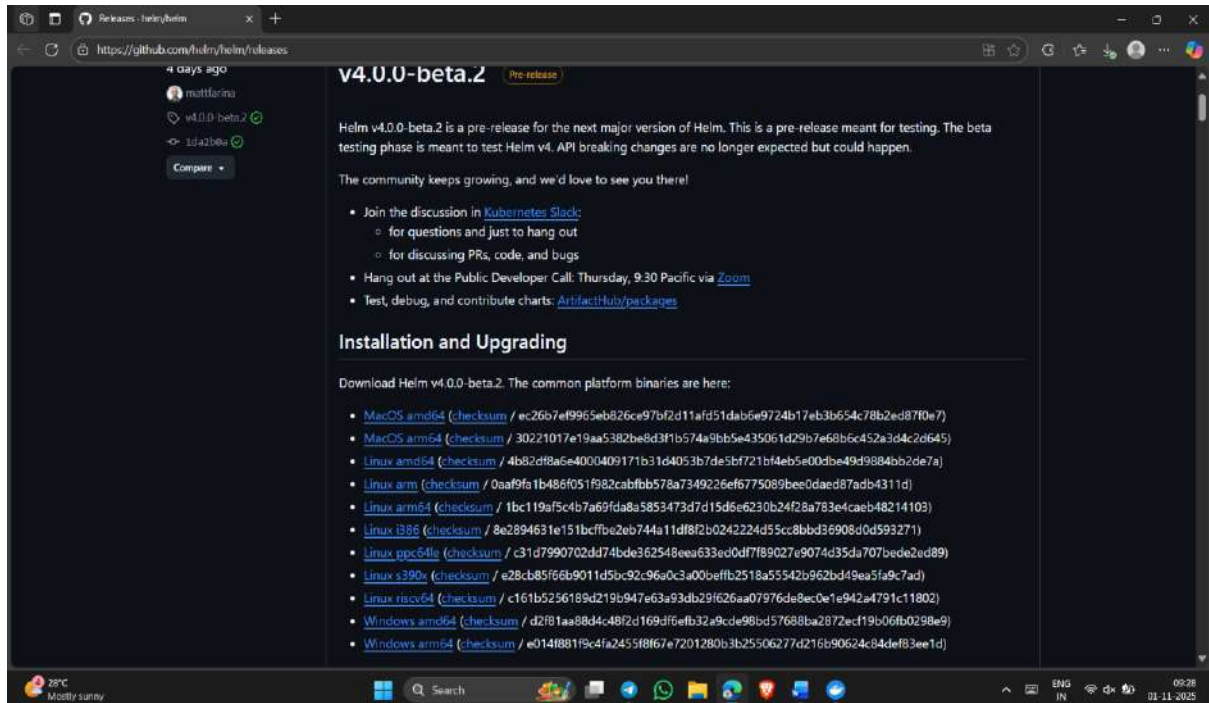
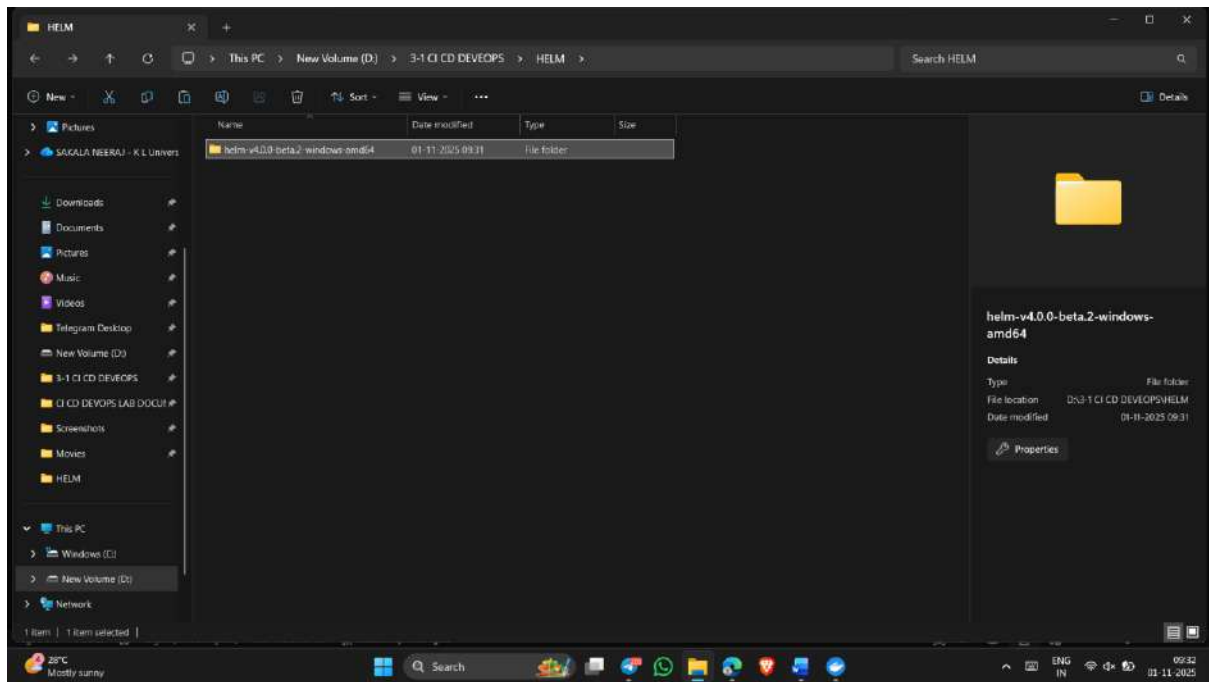


LAB 14

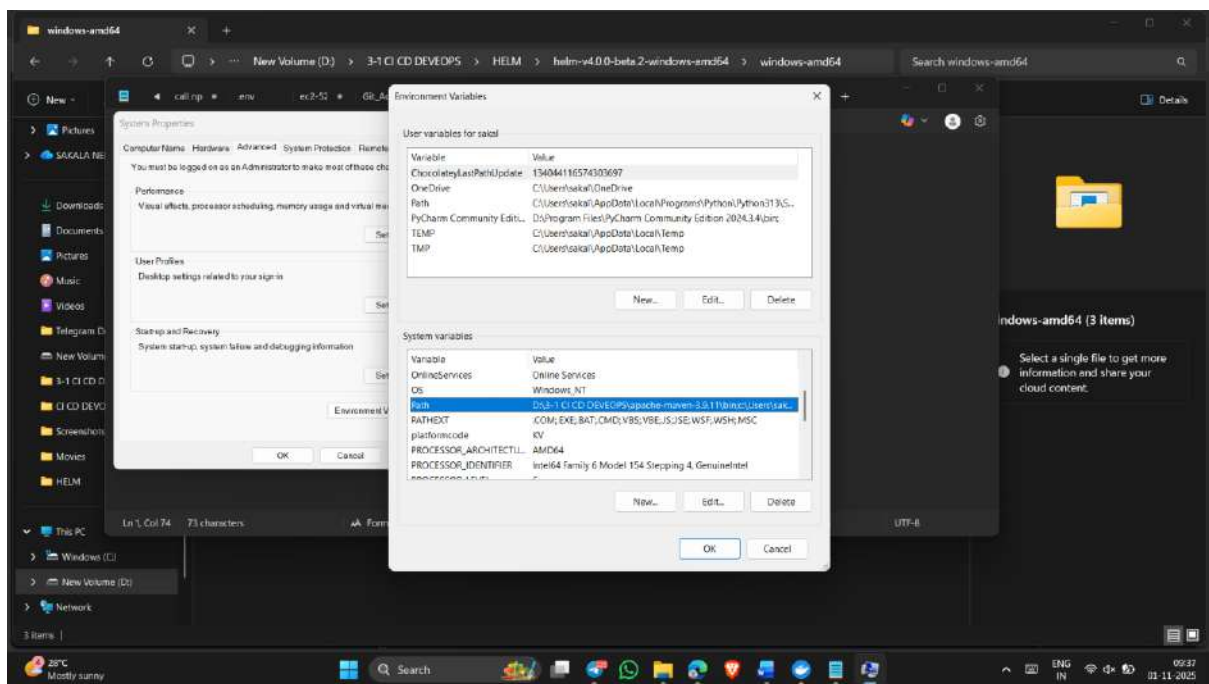
Kubernetes deployment using helm and ingress

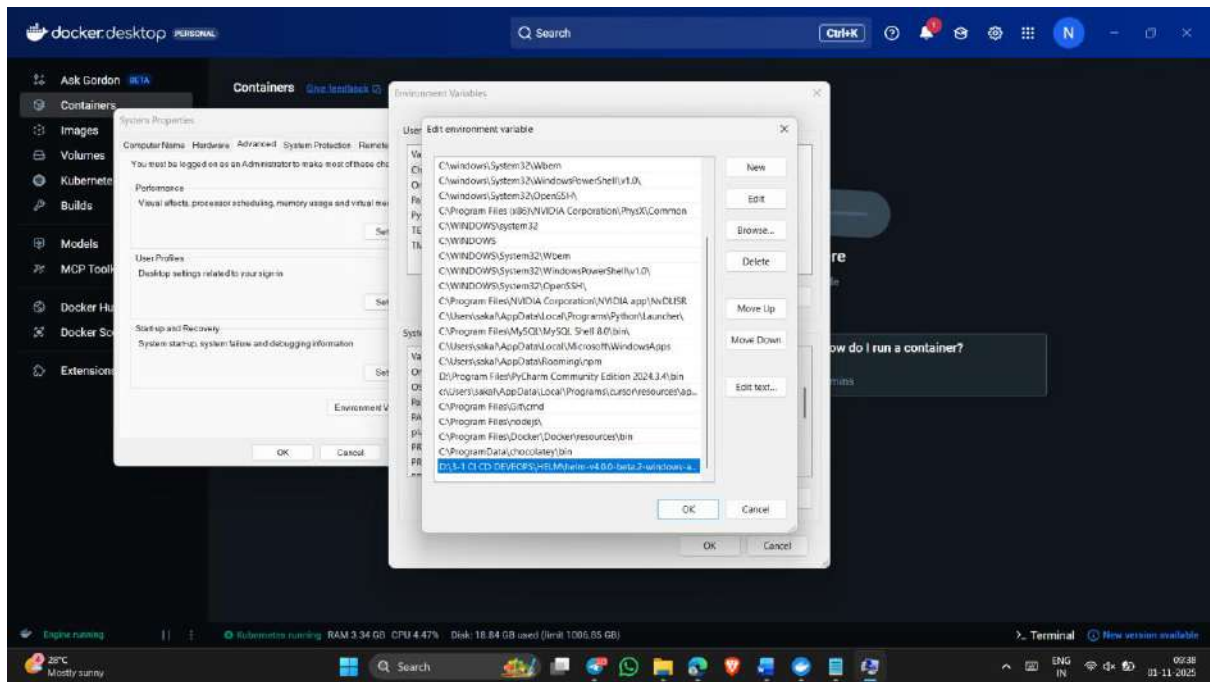
<https://github.com/helm/helm/releases>

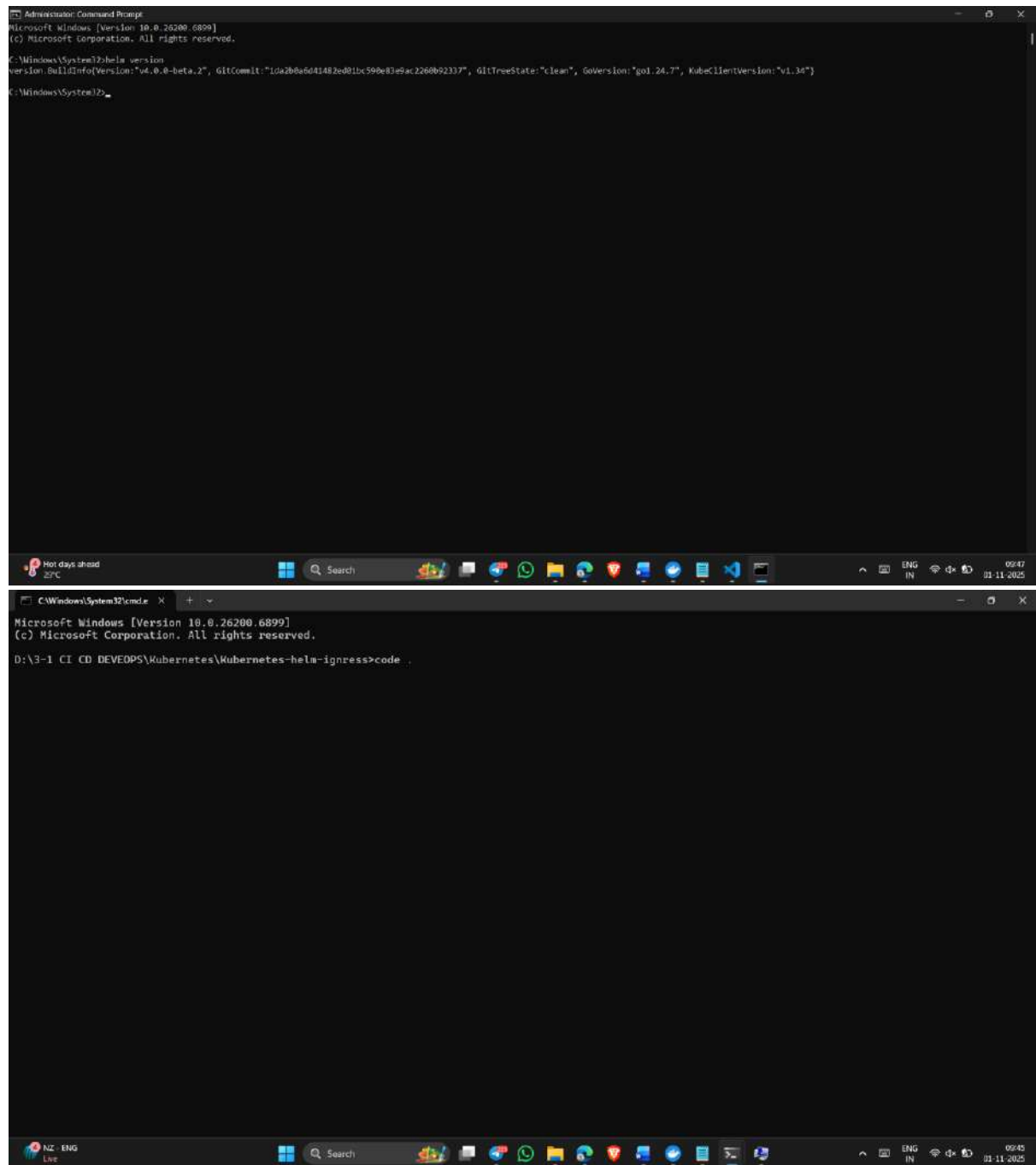


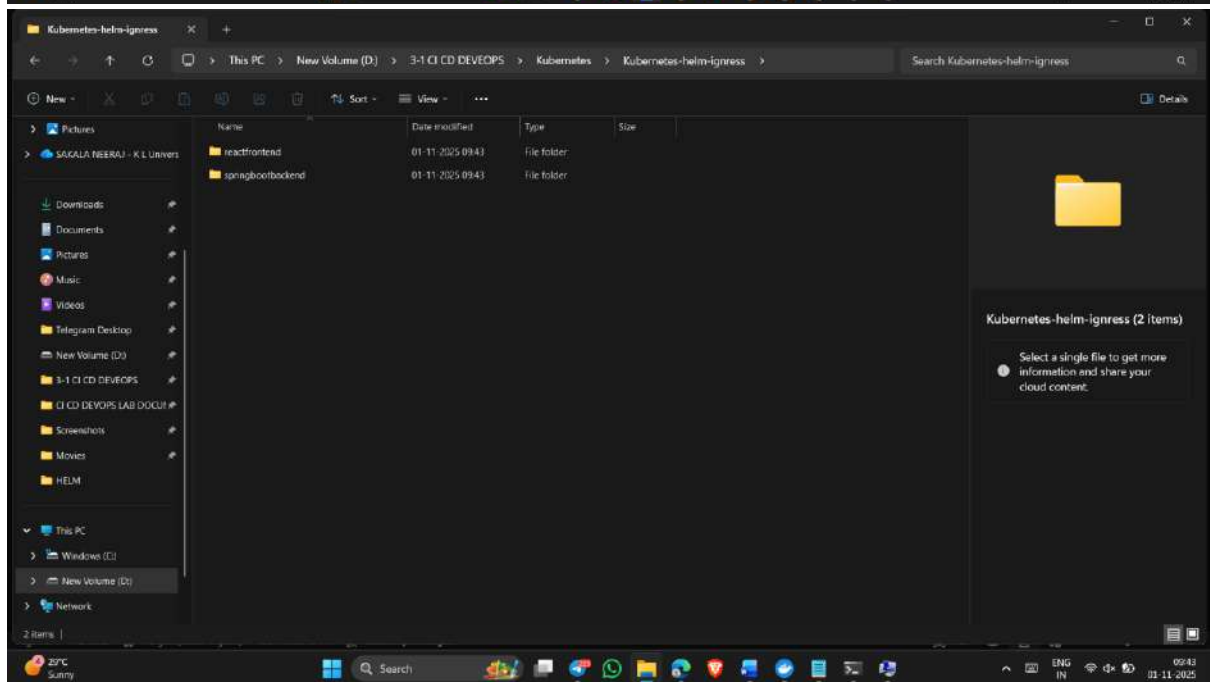
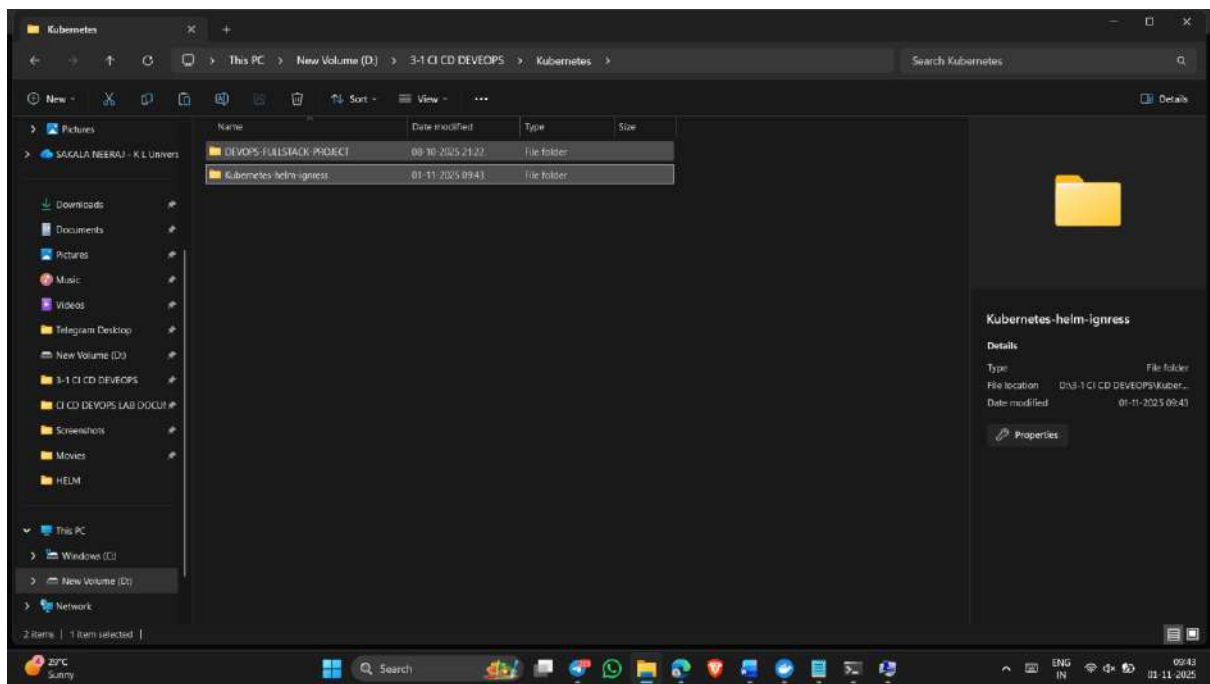


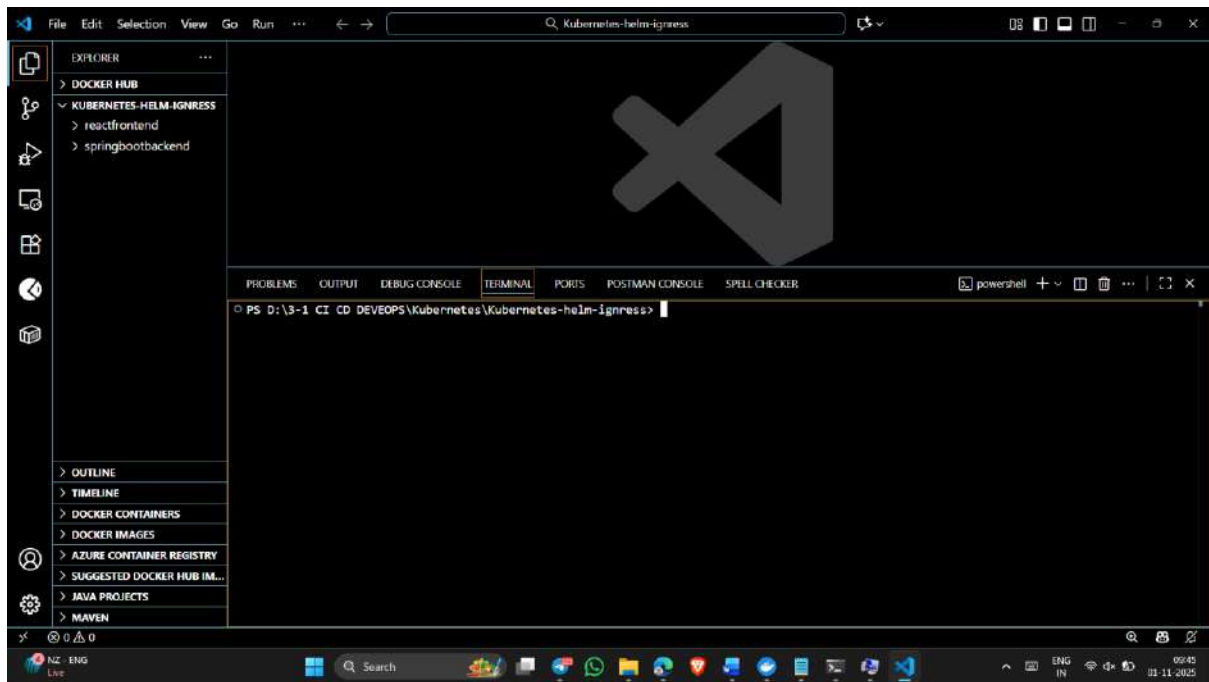
D:\3-1 CI CD DEVEOPS\HELM\helm-v4.0.0-beta.2-windows-amd64\windows-amd64



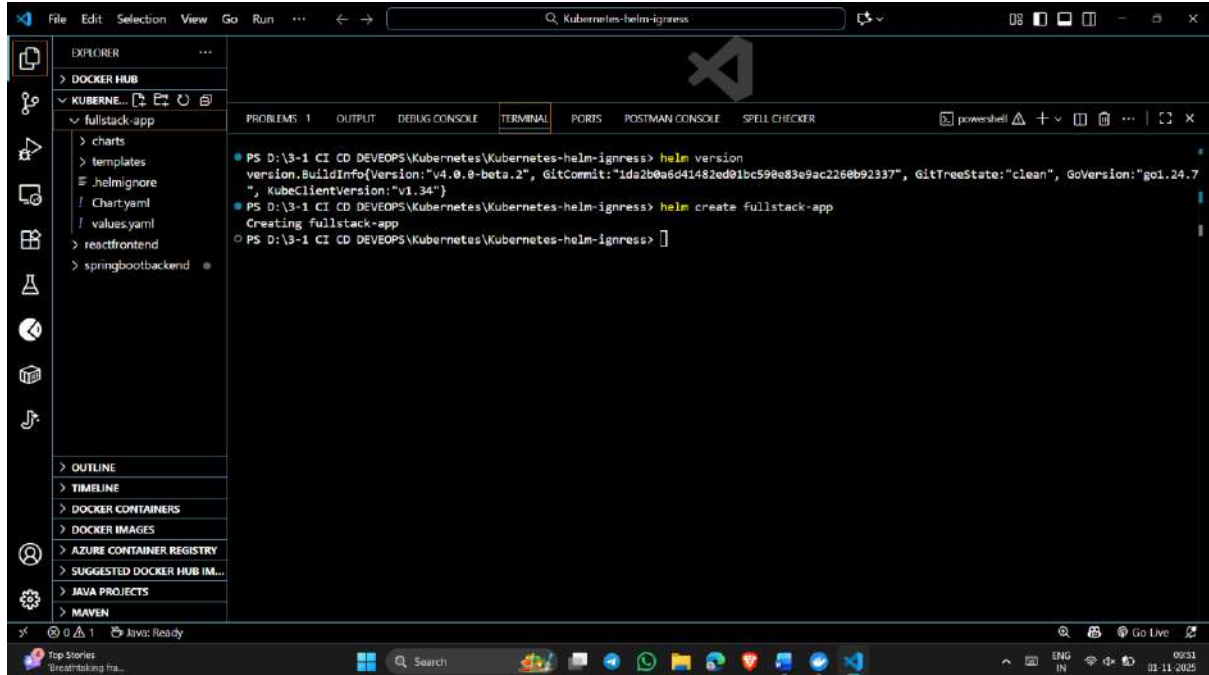
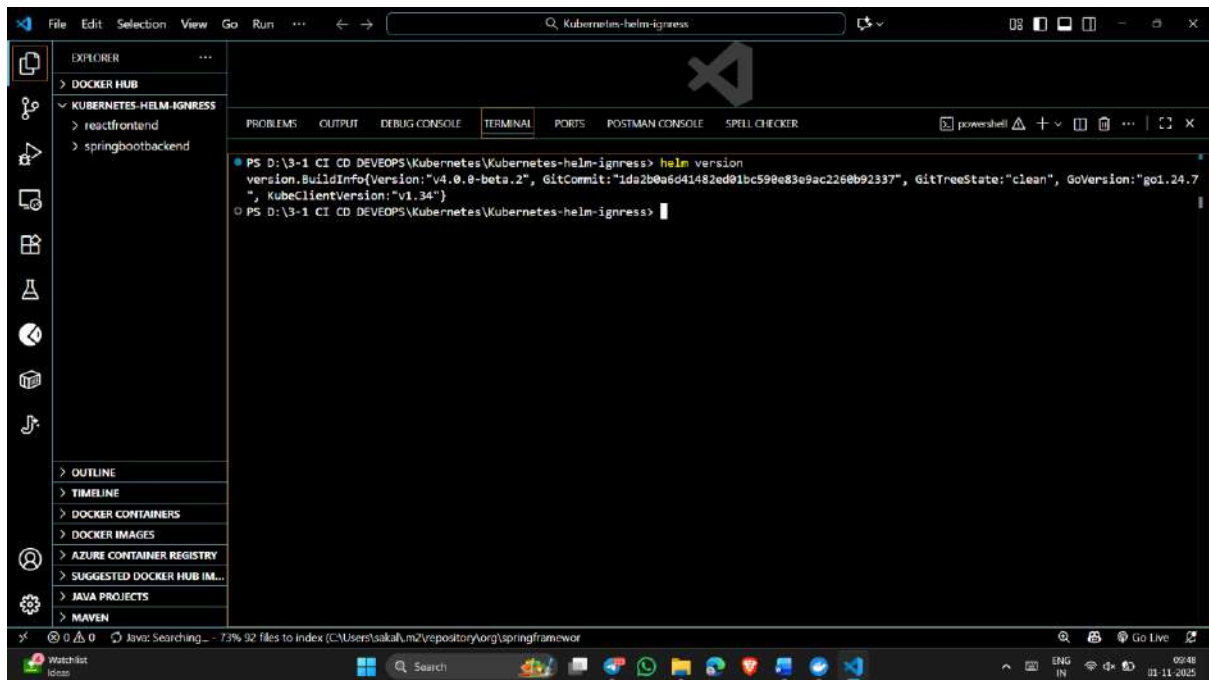


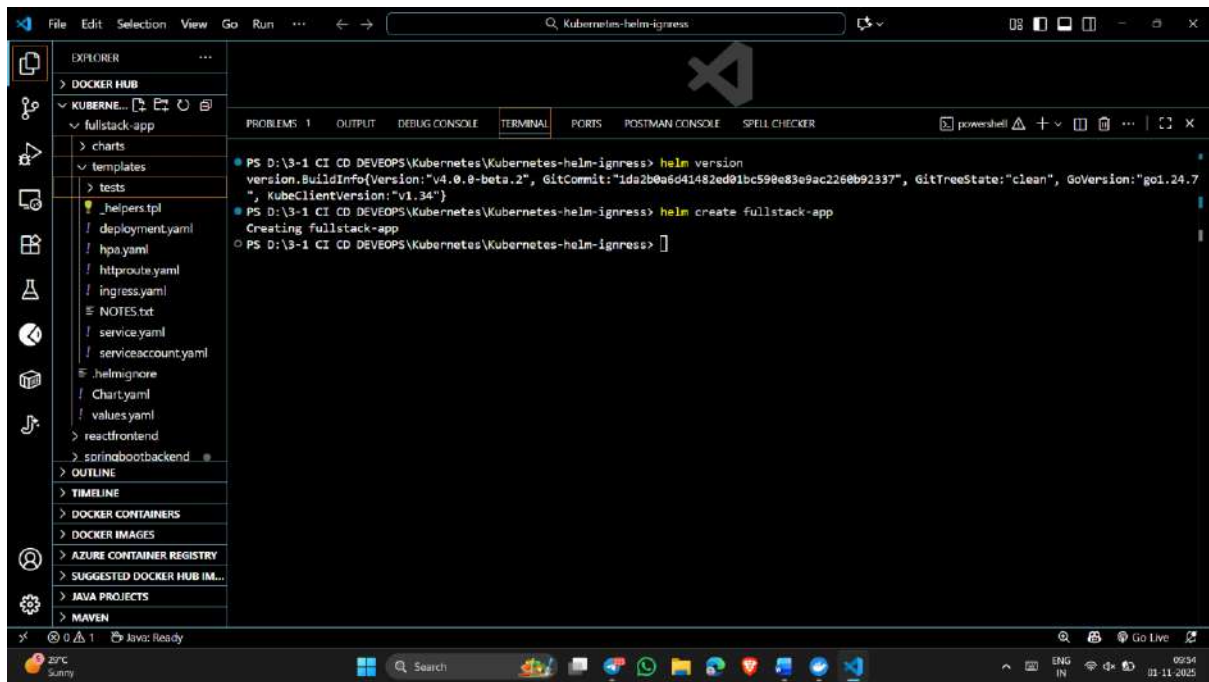




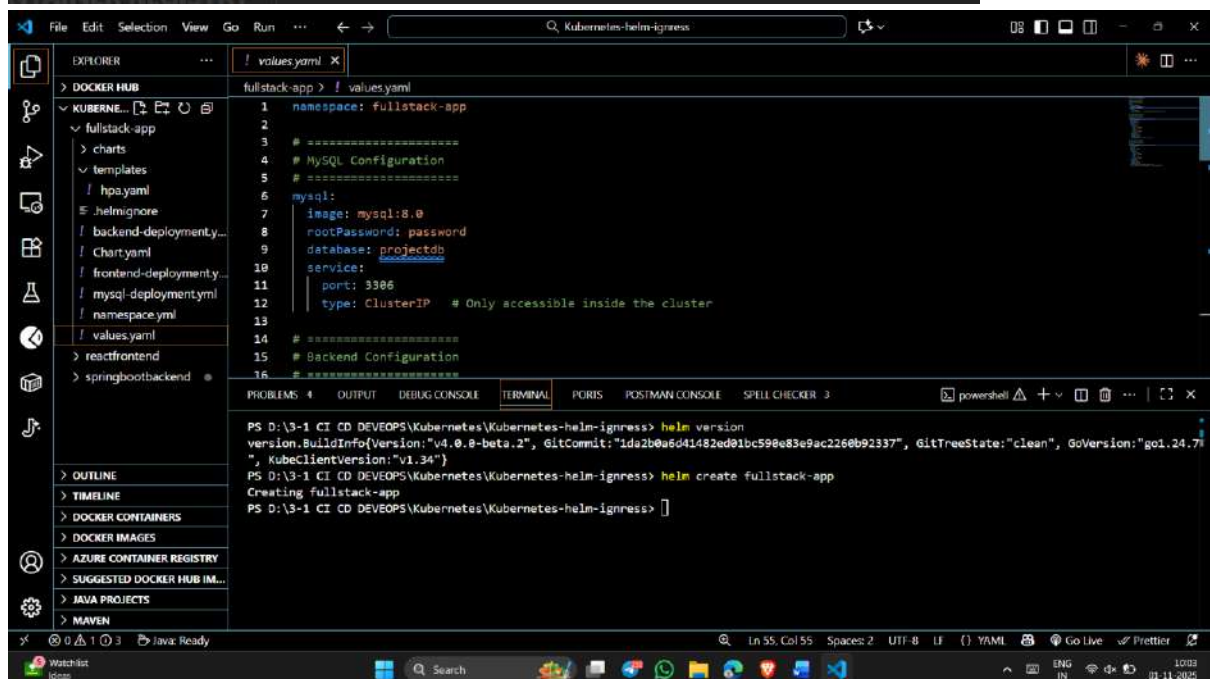
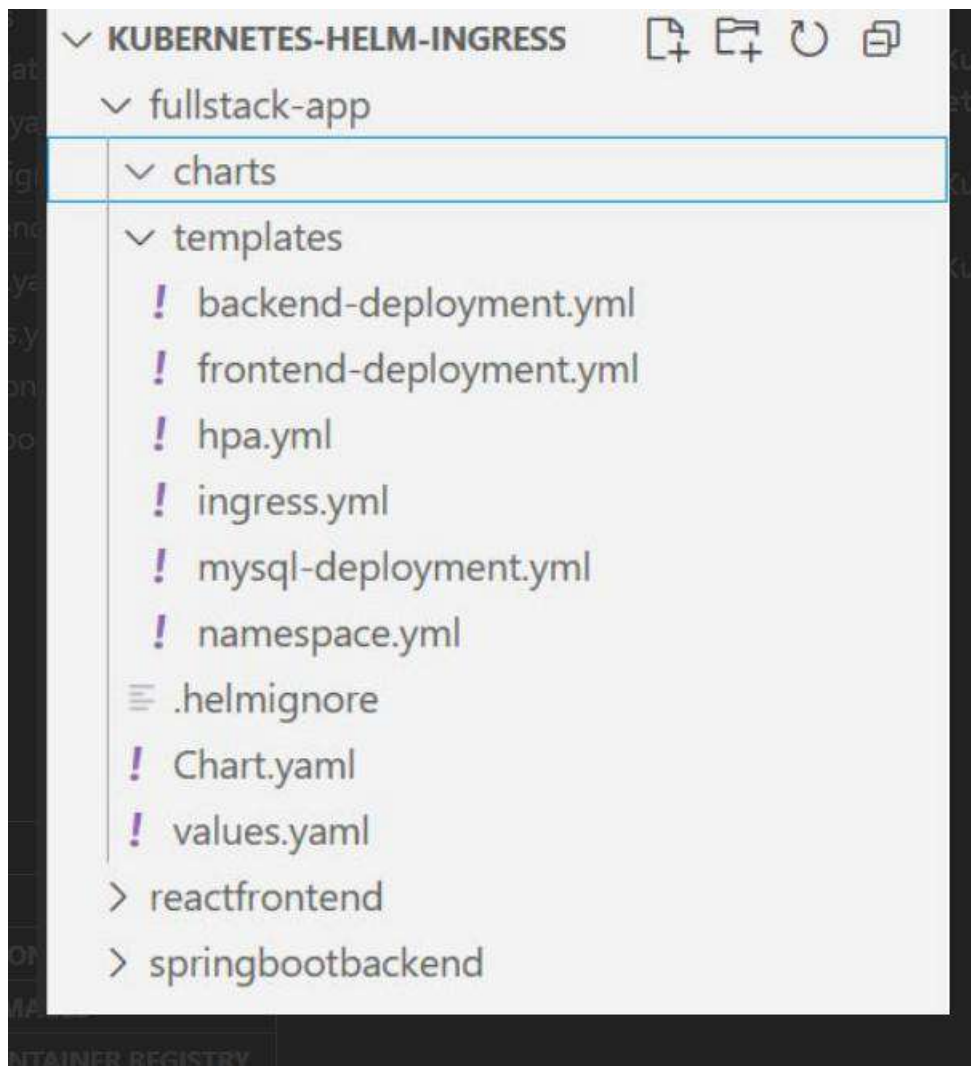


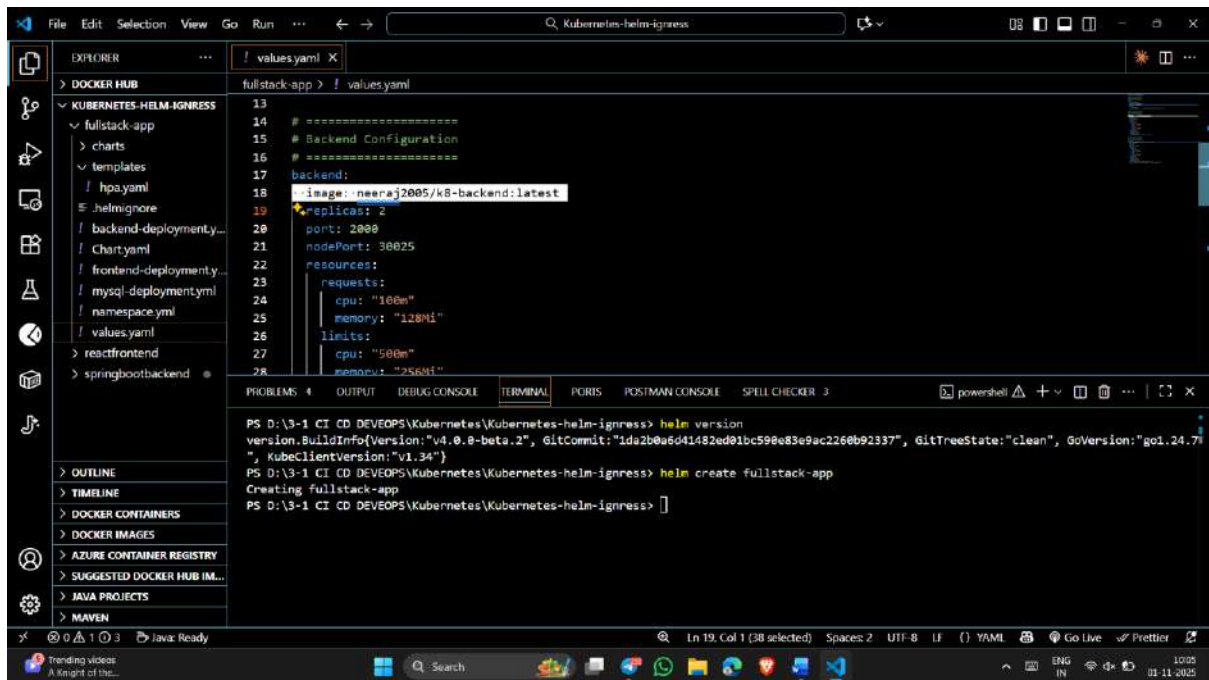
->Build docker images for both frontend and backend push them into docker hub





->remove tests , helpers,
deployment.yml,httproute.yml,nodes.txt,service.yml,seriveaccount.yml





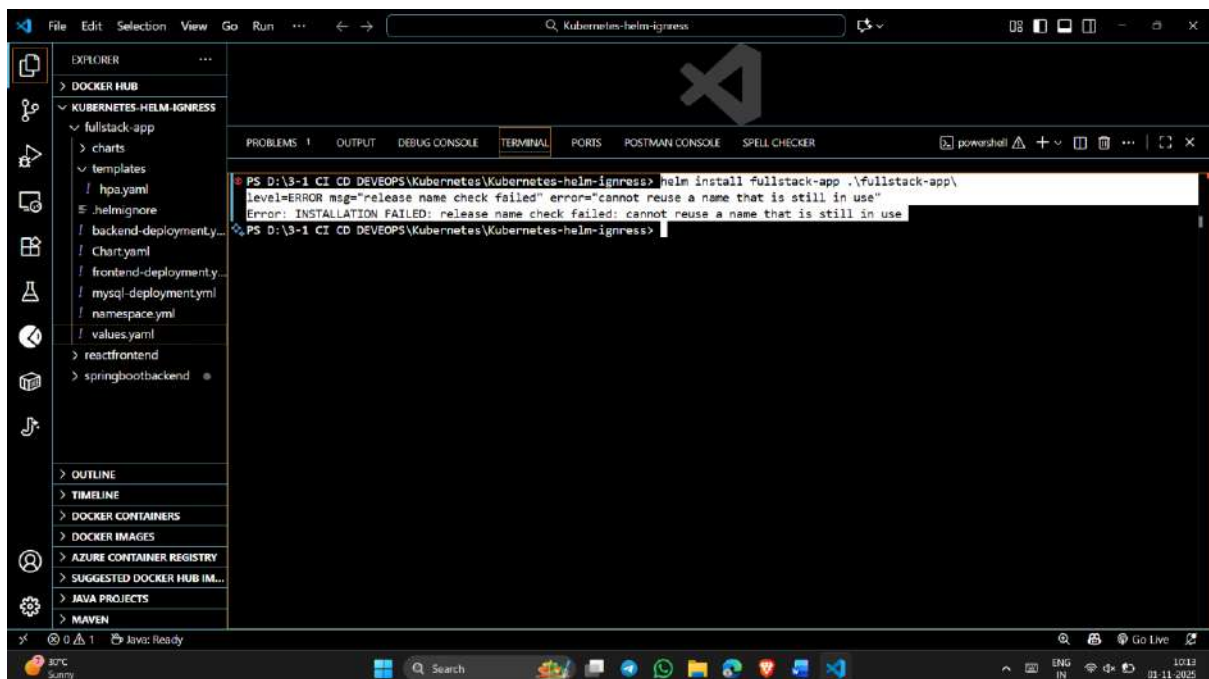
->helm install fullstack-app ./fullstack-app

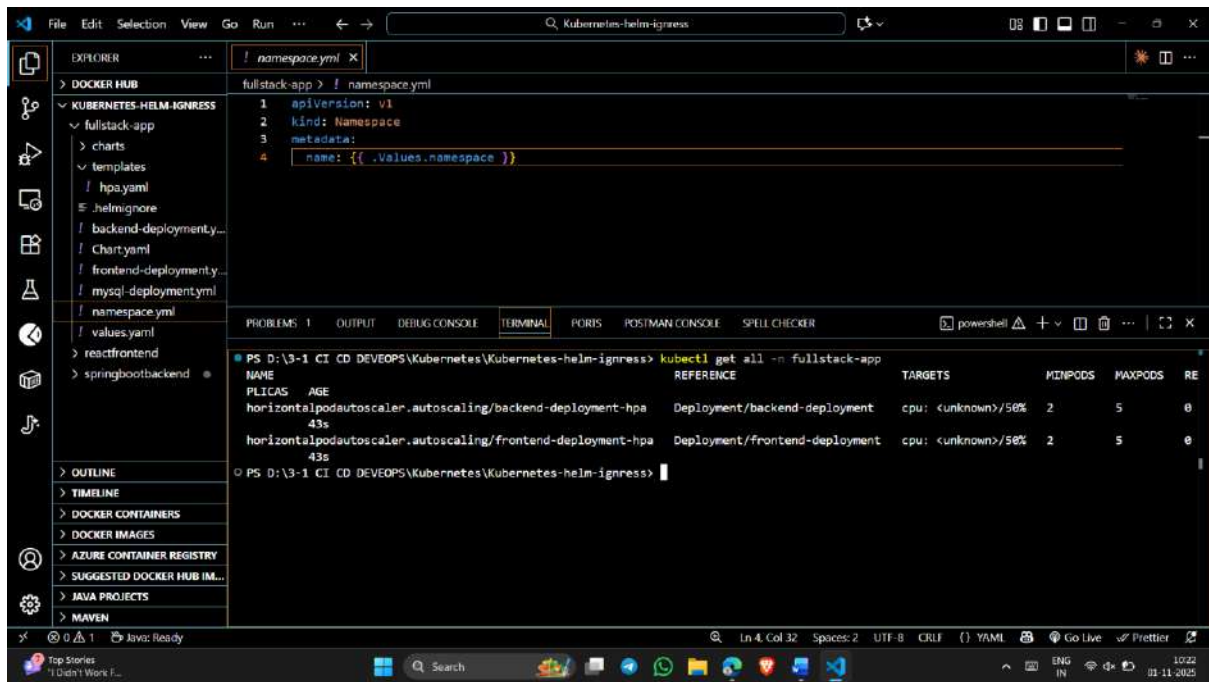
helm means cli tool

install means deploy a new release

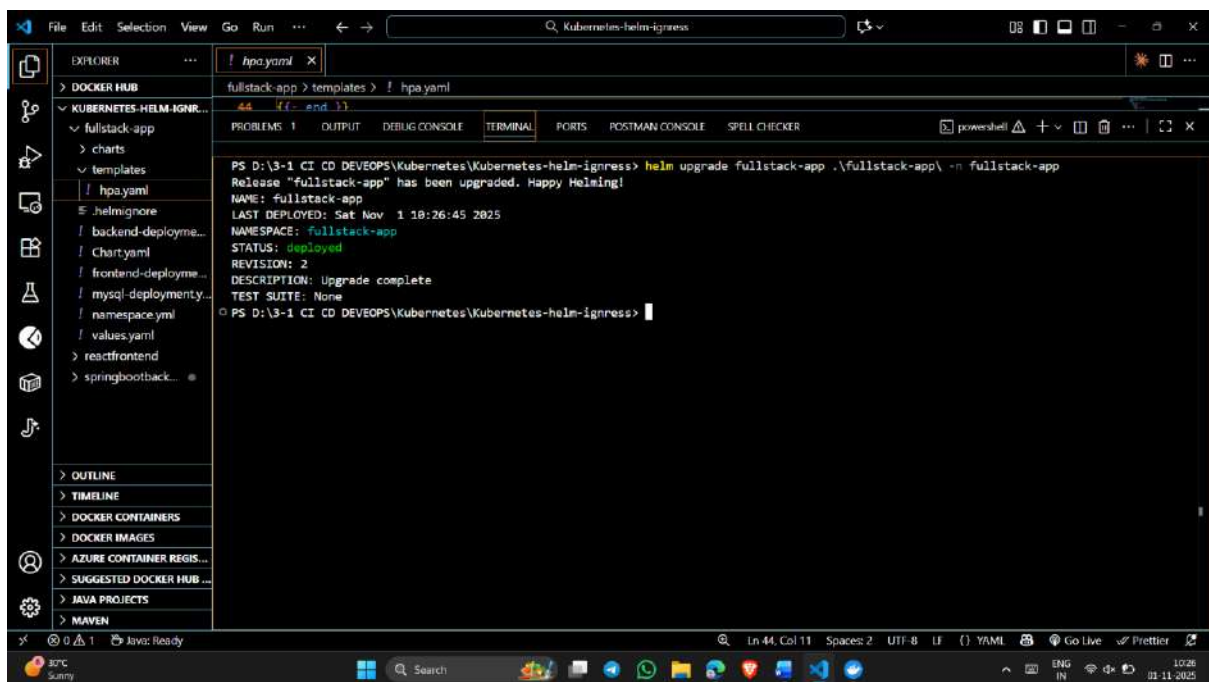
fullstack-app means name of the release name

./fullstack-app/ means helm directory





helm upgrade fullstack-app .\fullstack-app\



kubectl get all -n fullstack-app

File Edit Selection View Go Run Terminal Help

Kubernetes-helm-ignress

EXPLORER

- DOCKR HUB
- KUBERNETES-HELM-IGNRESS
 - fullstack-app
 - reactfrontend
 - springbootbackend

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

```
PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress> kubectl get all -n fullstack-app
```

NAME	READY	STATUS	RESTARTS	AGE
pod/backend-deployment-6d88c7c7b-8xbw	1/1	Running	0	86s
pod/backend-deployment-6d88c7c7b-fxg7p	1/1	Running	0	86s
pod/frontend-deployment-5587966678-ldt6b	1/1	Running	0	86s
pod/frontend-deployment-5587966678-qvcbf	1/1	Running	0	86s
pod/mysql-deployment-78c4d56997-9gghv	1/1	Running	0	86s

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/backend-deployment-service	NodePort	10.103.132.233	<none>	2800:30825/TCP	86s
service/frontend-deployment-service	NodePort	10.111.199.89	<none>	80:30880/TCP	86s
service/mysql-service	ClusterIP	10.111.61.150	<none>	3306/TCP	86s

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/backend-deployment	2/2	2	2	87s
deployment.apps/frontend-deployment	2/2	2	2	87s
deployment.apps/mysql-deployment	1/1	1	1	87s

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/backend-deployment-6d88c7c7b	2	2	2	87s
replicaset.apps/frontend-deployment-5587966678	2	2	2	87s
replicaset.apps/mysql-deployment-78c4d56997	1	1	1	87s

NAME	REFERENCE	TARGETS	MINPODS	MAXPODS	REPLICAS	AGE
horizontalpodautoscaler.autoscaling/backend-deployment-hpa	Deployment/backend-deployment	cpu: <unknown>/50%	2	5	2	87s
horizontalpodautoscaler.autoscaling/frontend-deployment-hpa	Deployment/frontend-deployment	cpu: <unknown>/50%	2	5	2	87s

PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress>

20°C Party sunny

ENG IN 07:30 05-11-2025

File Edit Selection View Go Run Terminal Help

Kubernetes-helm-ignress

EXPLORER

- DOCKR HUB
- KUBERNETES-HELM-IGNRESS
 - fullstack-app
 - reactfrontend
 - springbootbackend

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

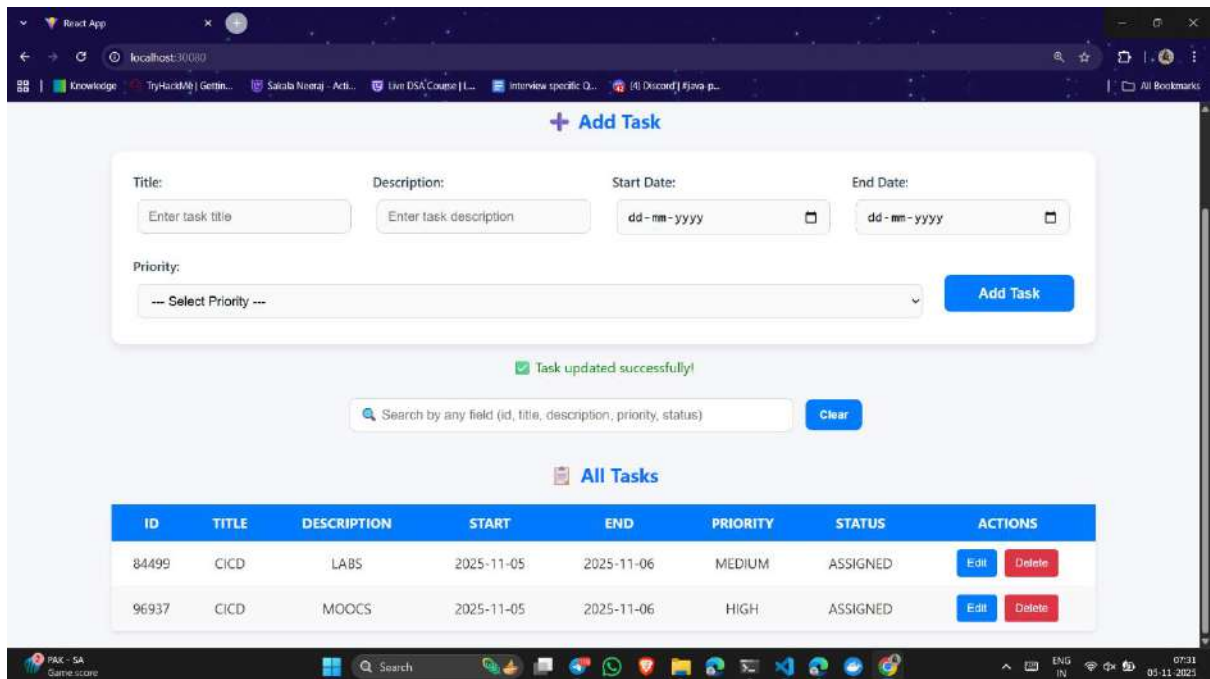
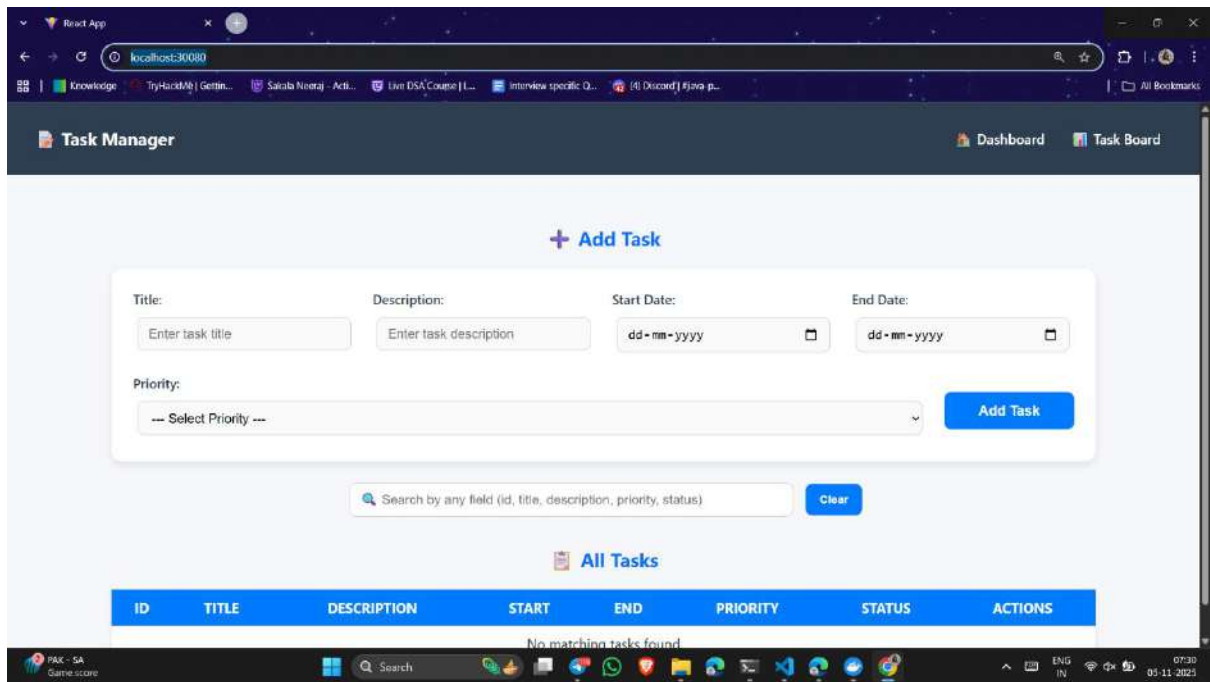
```
PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress> kubectl get pods -n fullstack-app
```

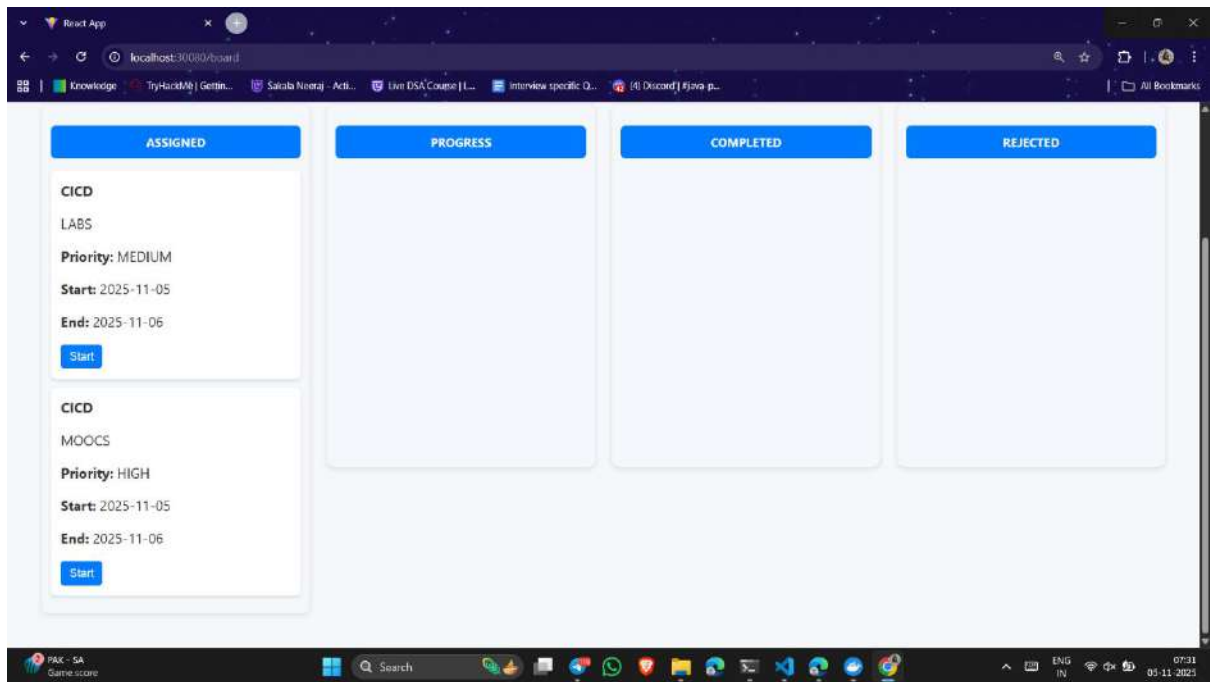
NAME	READY	STATUS	RESTARTS	AGE
backend-deployment-6d88c7c7b-8xbw	1/1	Running	0	108s
backend-deployment-6d88c7c7b-fxg7p	1/1	Running	0	108s
frontend-deployment-5587966678-ldt6b	1/1	Running	0	108s
frontend-deployment-5587966678-qvcbf	1/1	Running	0	108s
mysql-deployment-78c4d56997-9gghv	1/1	Running	0	108s

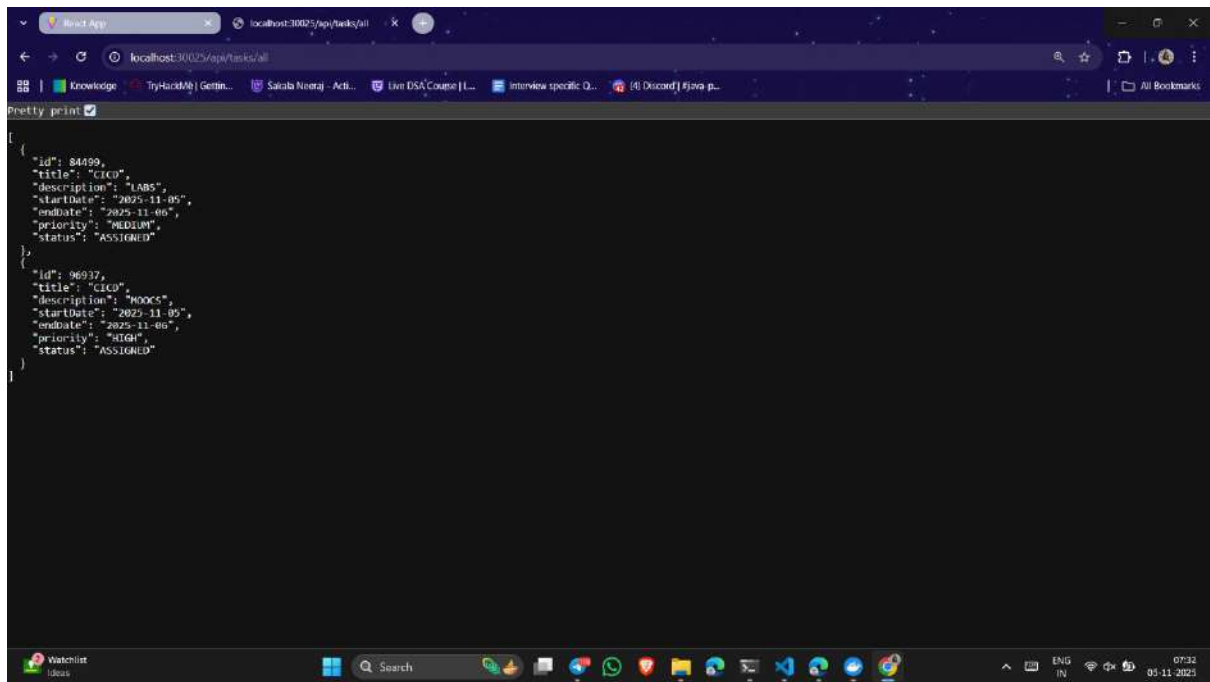
PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress>

PAK SA Game score

ENG IN 07:30 05-11-2025







Swagger UI

localhost:30025/swagger-ui/index.html/

Swagger

Task Management API 1.0.0

Spring Boot REST API for managing tasks.

Developer Team - Whistle

Send email to Developer Team

Version 2.0

Server: http://localhost:30025 - Generated server url

task-controller

PUT	/api/tasks/update/status/{id}
PUT	/api/tasks/update/{id}
POST	/api/tasks/add
GET	/api/tasks/get/{id}
GET	/api/tasks/all
GET	/api/tasks/
DELETE	/api/tasks/delete/{id}

Schemas

Task

VS Code

Kubernetes-helm-ignores

EXPLORER

- DOCKER HUB
- KUBERNETES-HELM-IGNORES
 - fullstack-app
 - reactfrontend
 - springbootbackend

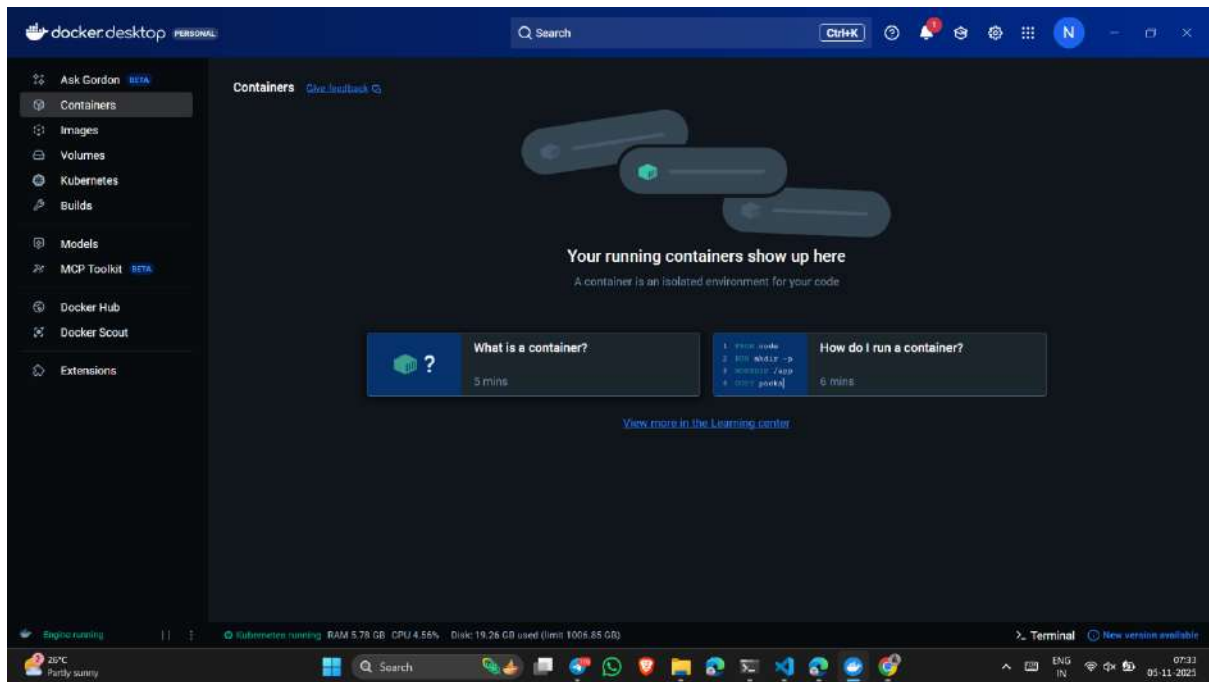
PROBLEMS | OUTPUT | DEBUG CONSOLE | TERMINAL | PORTS | POSTMAN CONSOLE | SPELL CHOKER

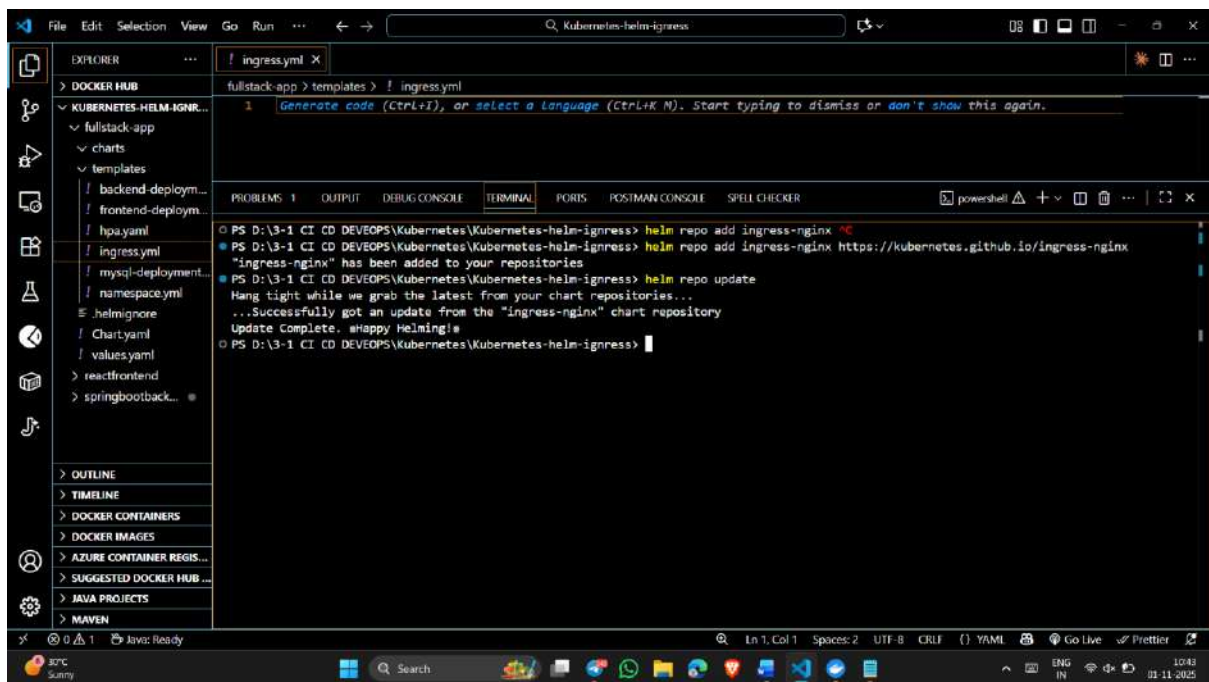
```
PS D:\V3-1-CT-CD\DEVOPS\kubernetes-helm-ignores> kubectl delete namespace fullstack-app
namespace "fullstack-app" deleted
```

0 1 Java: Ready

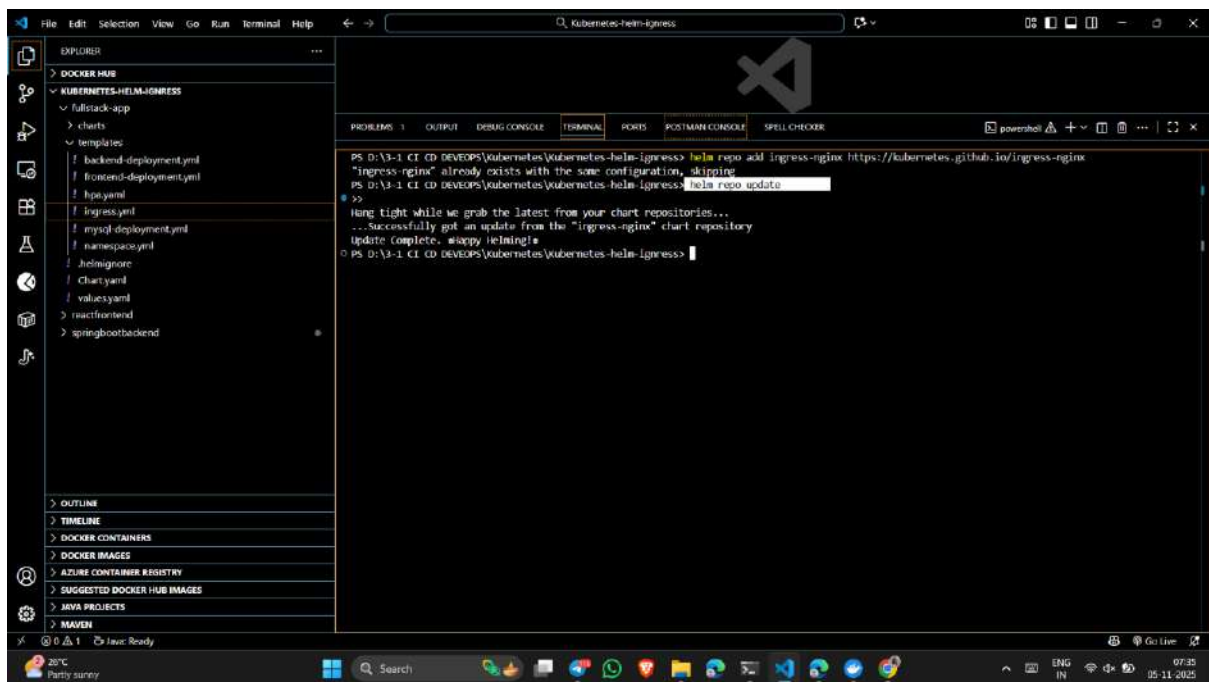
20°C Party party

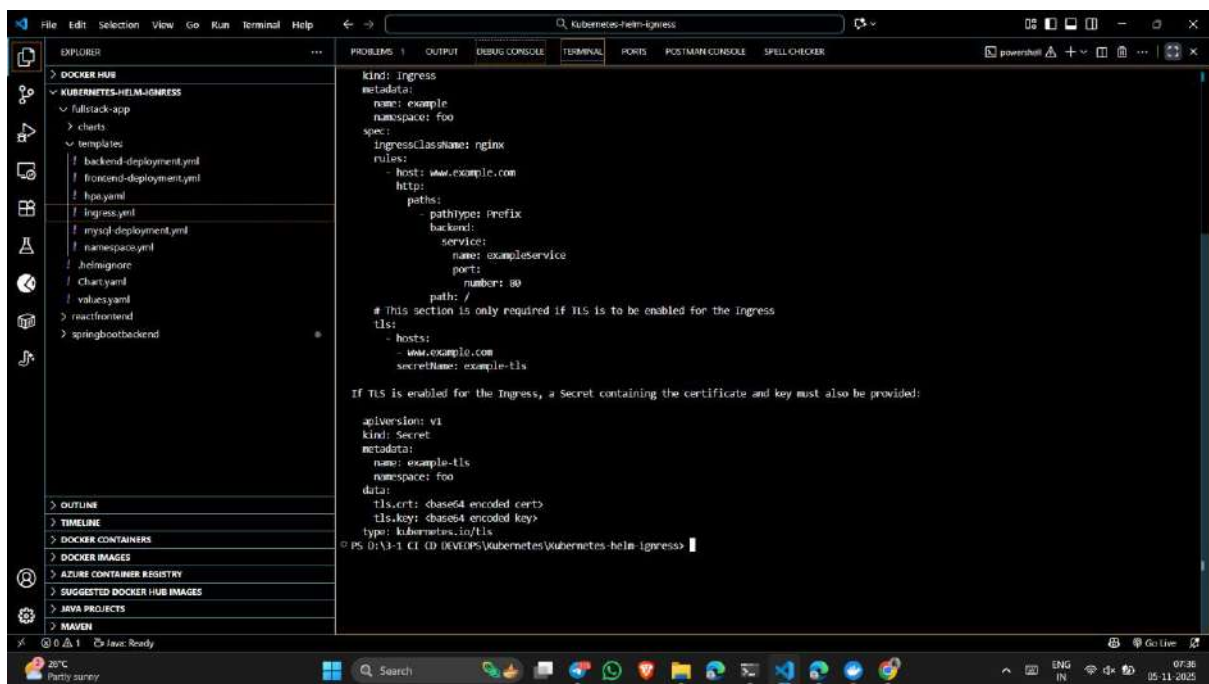
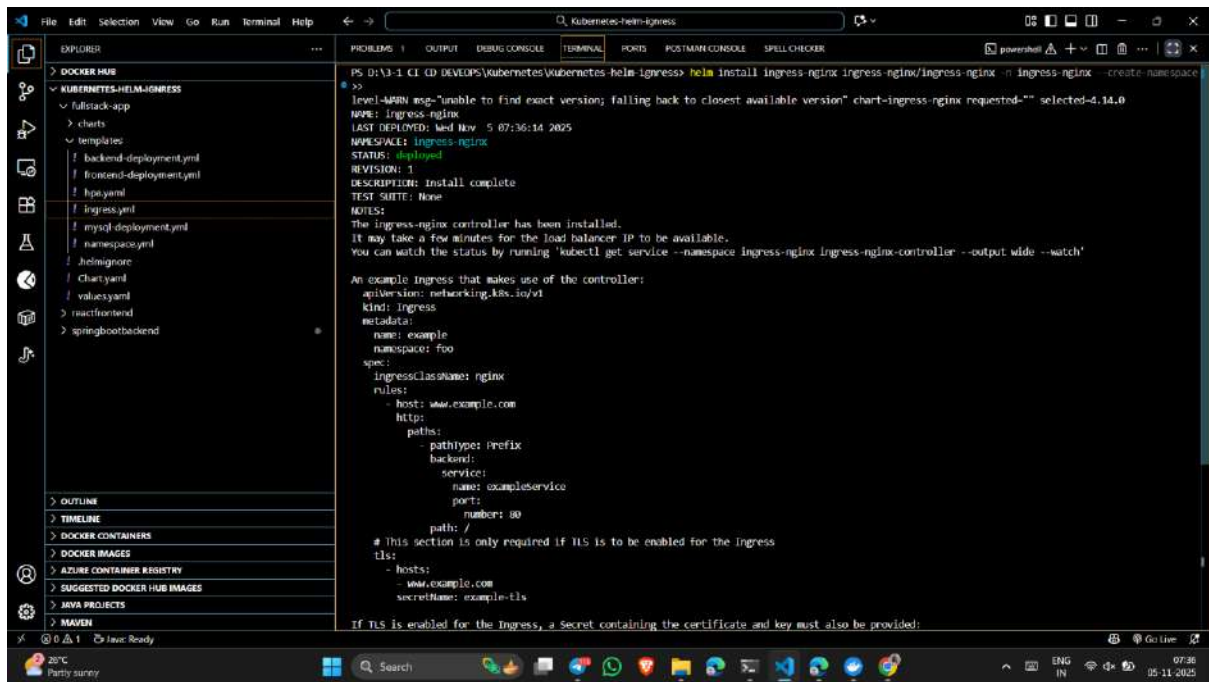
07:33 05-11-2025

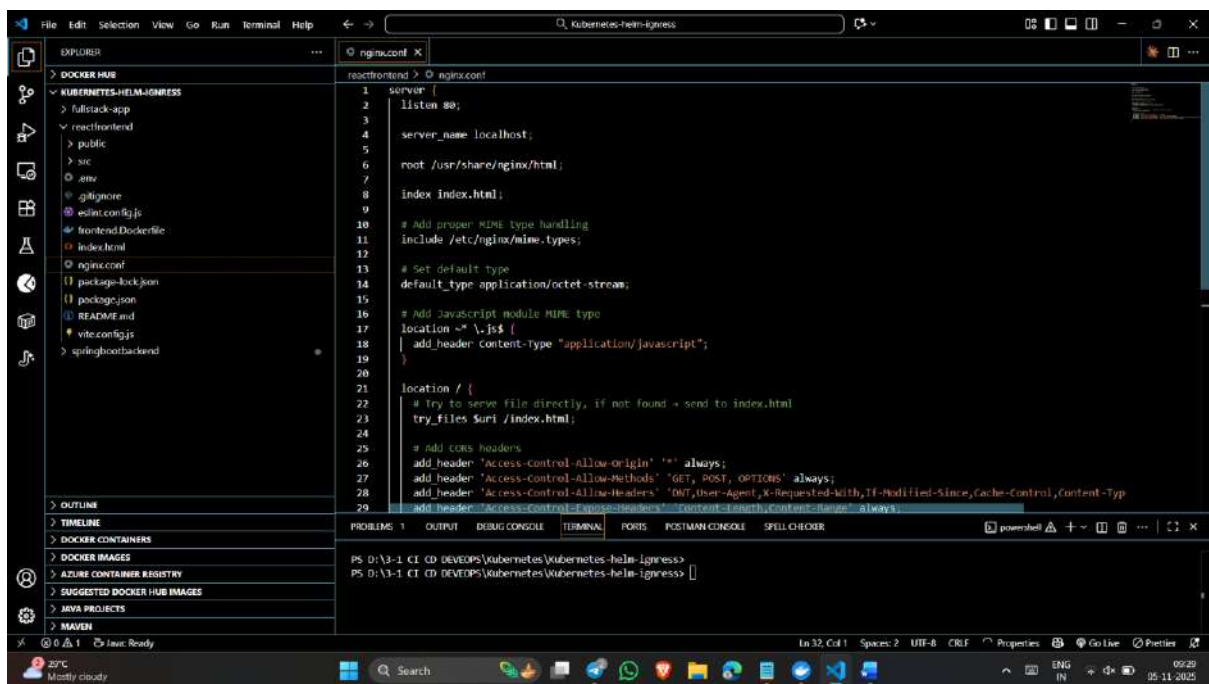
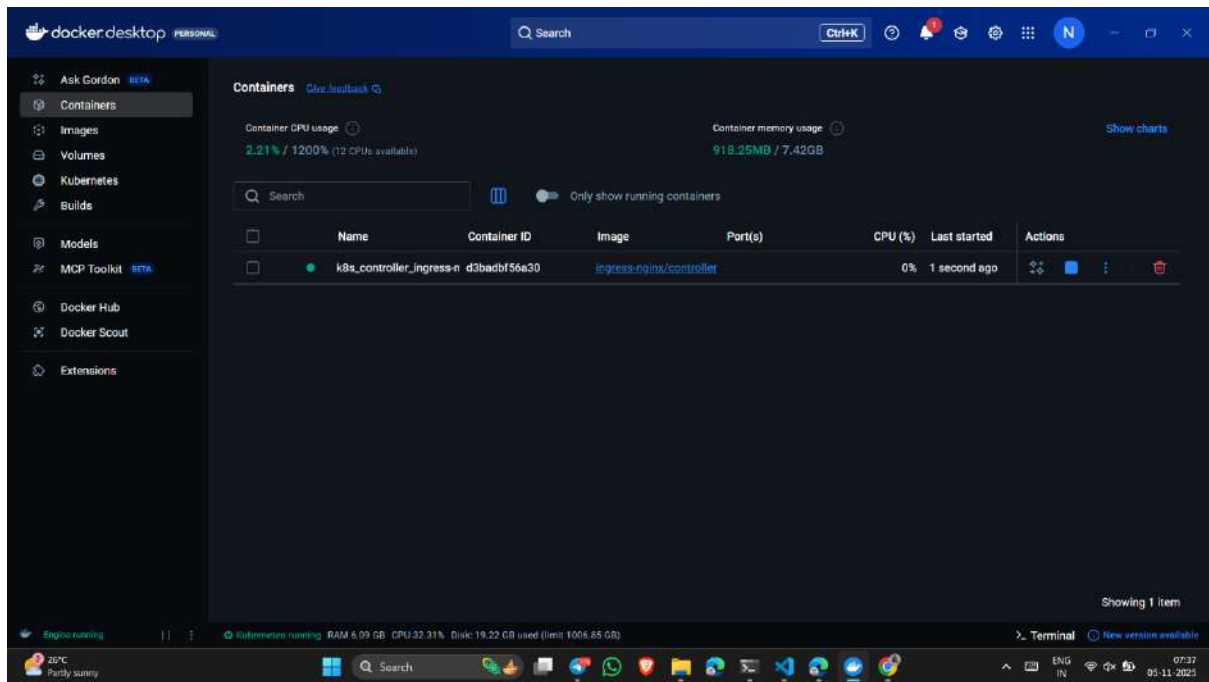


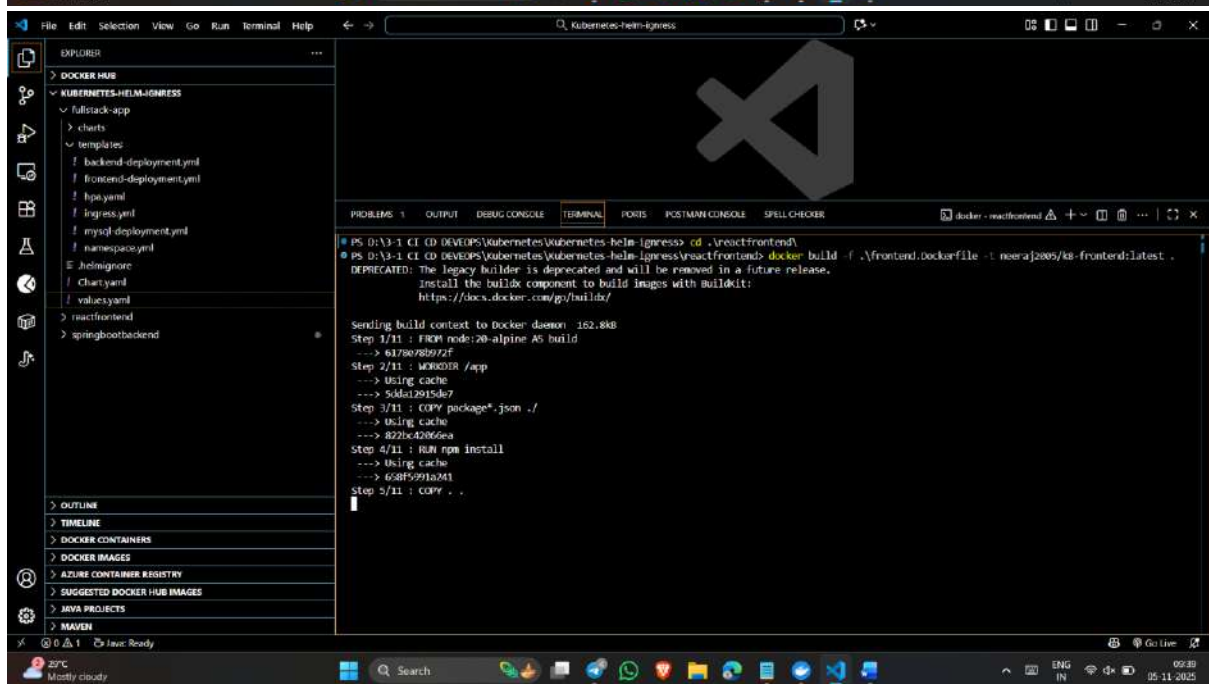
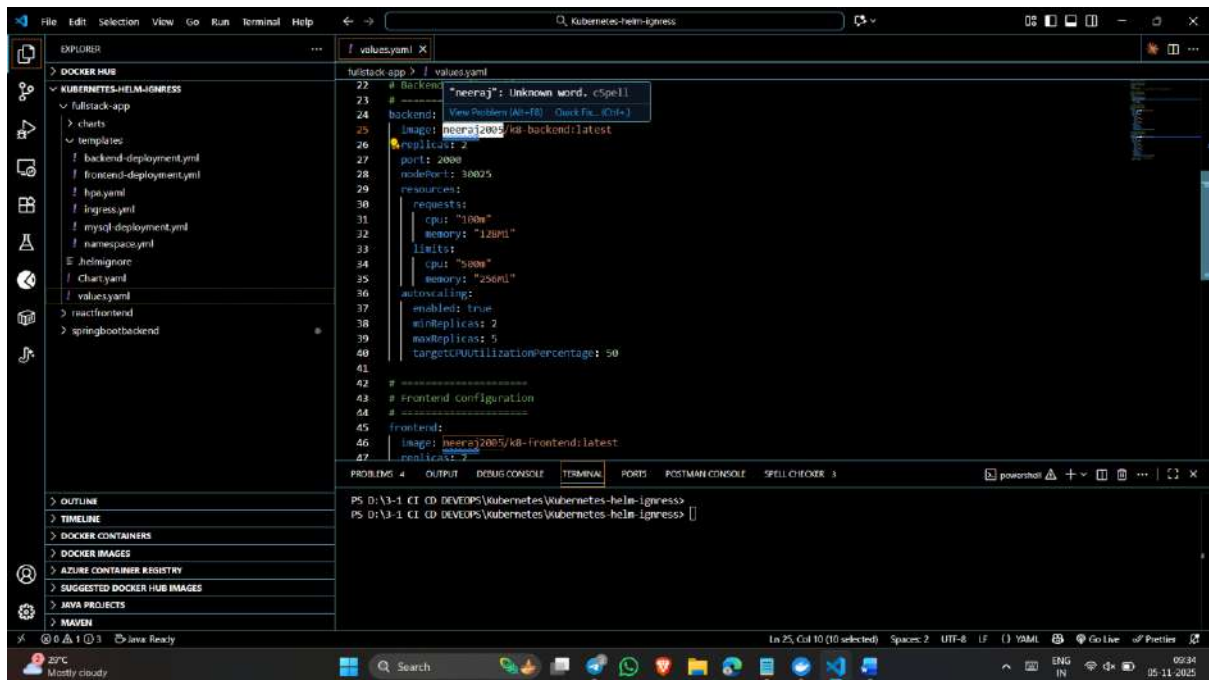


Helm with ingress










```
File Edit Selection View Go Run Terminal Help
Kubernetes-helm-ignress

EXPLORER
DOCKERR HUB
KUBERNETES-HELM-IGNRESS
fullstack-app
charts
templates
backend-deployment.yml
frontend-deployment.yml
hpax.yml
ingress.yml
mysql-deployment.yml
namespace.yml
E Jolainignore
Chart.yml
values.yml
reactfrontend
springbootbackend

OUTLINE
TIMELINE
DOCKERR CONTAINERS
DOCKERR IMAGES
AZURE CONTAINER REGISTRY
SUGGESTED DOCKERR HUB IMAGES
JAVA PROJECTS
MAVEN

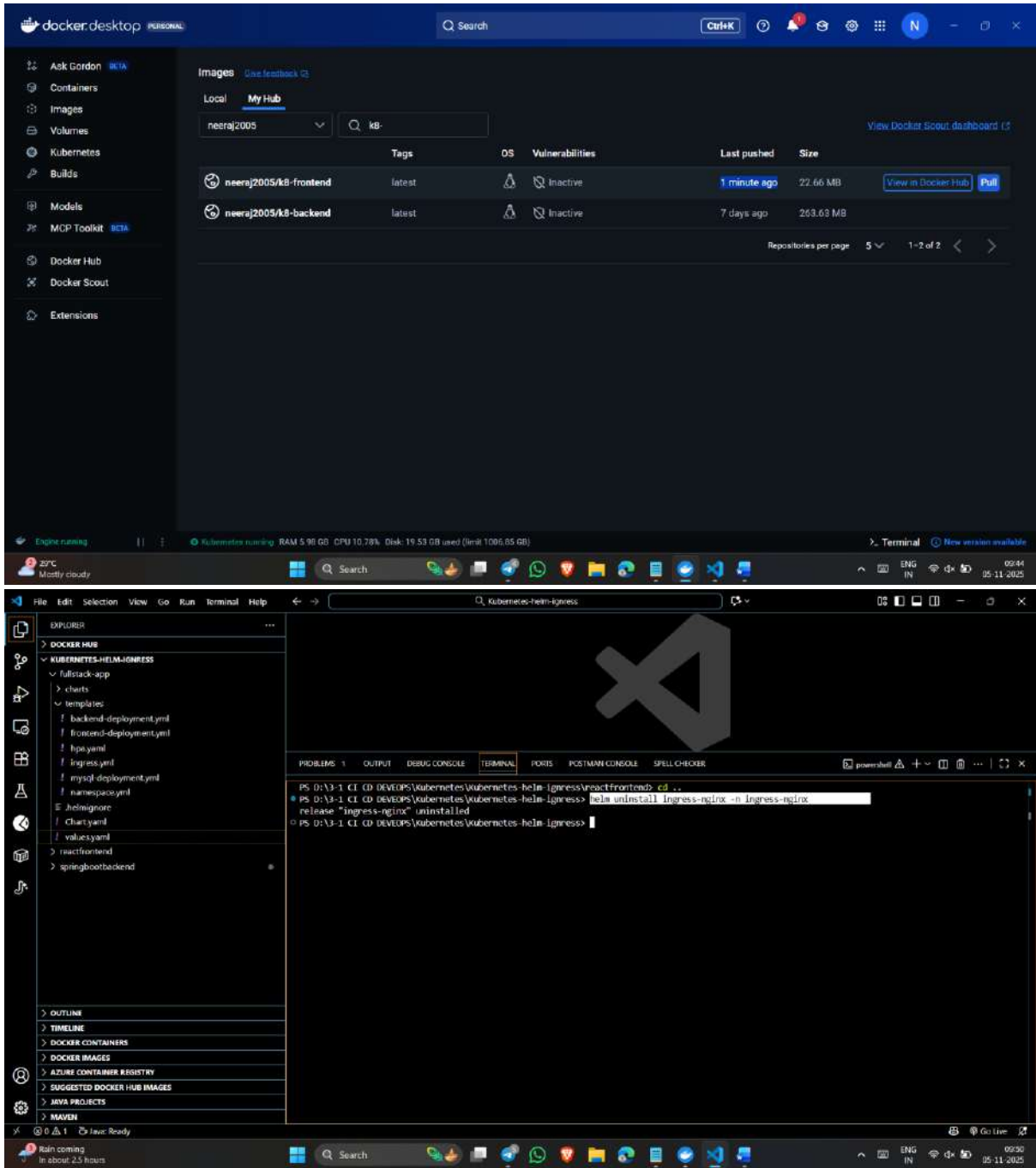
PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress\reactfrontend> docker build -f ./frontend.dockerfile -t neeraj2005/ks-frontent:latest .
dist/assets/index-B996a922.js 269.90 KB | gzip: 88.88 KB
✓ built in 4.71s
npm notice
npm notice New major version of npm available! 10.8.2 -> 11.6.2
npm notice (changelog: https://github.com/npm/cli/releases/tag/v11.6.2)
npm notice To update run: npm install -g npm@11.6.2
npm notice
--> Removed intermediate container f68a746d0f
--> f6d4b2d8115
Step 7/11 : FROM nginx:alpine
--> 61e01287e596
Step 8/11 : COPY nginx.conf /etc/nginx/conf.d/default.conf
--> 62a3c473406a
Step 9/11 : COPY --from=build /app/dist /usr/share/nginx/html
--> 56d12341c19f
Step 10/11 : EXPOSE 80
--> Running in 5d1884d438d
--> Removed intermediate container 0dd8d4ded3ad
--> 03d43c0e1296
Step 11/11 : CMD ["nginx", "-g", "daemon off;"]
--> Running in b55b780cc55
--> Removed intermediate container b55b780cc55
--> 2c4224221170
Successfully built 2c4224221170
Successfully tagged neeraj2005/ks-frontent:latest
SECURITY WARNING: You are building a Docker image from Windows against a non-Windows Docker host. All files and directories added to build context will have '-rw-r-x-r-x' permissions. It is recommended to double check and reset permissions for sensitive files and directories.
PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress\reactfrontend>
```

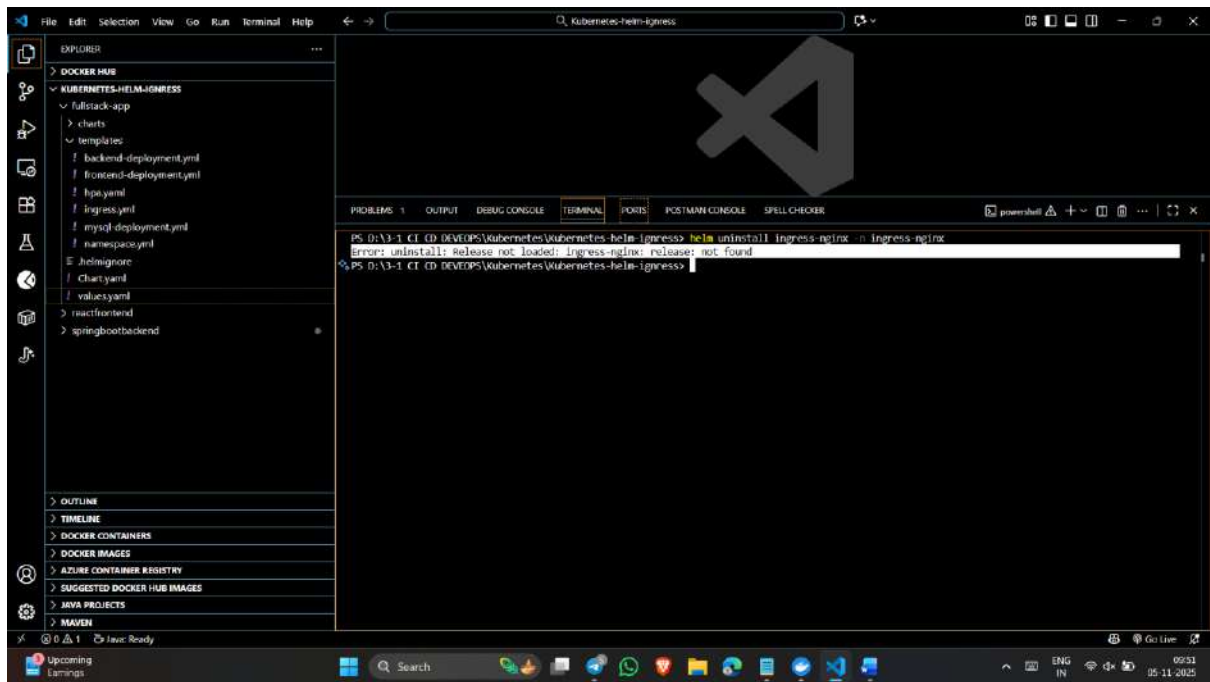
```
File Edit Selection View Go Run Terminal Help
Kubernetes-helm-ignress

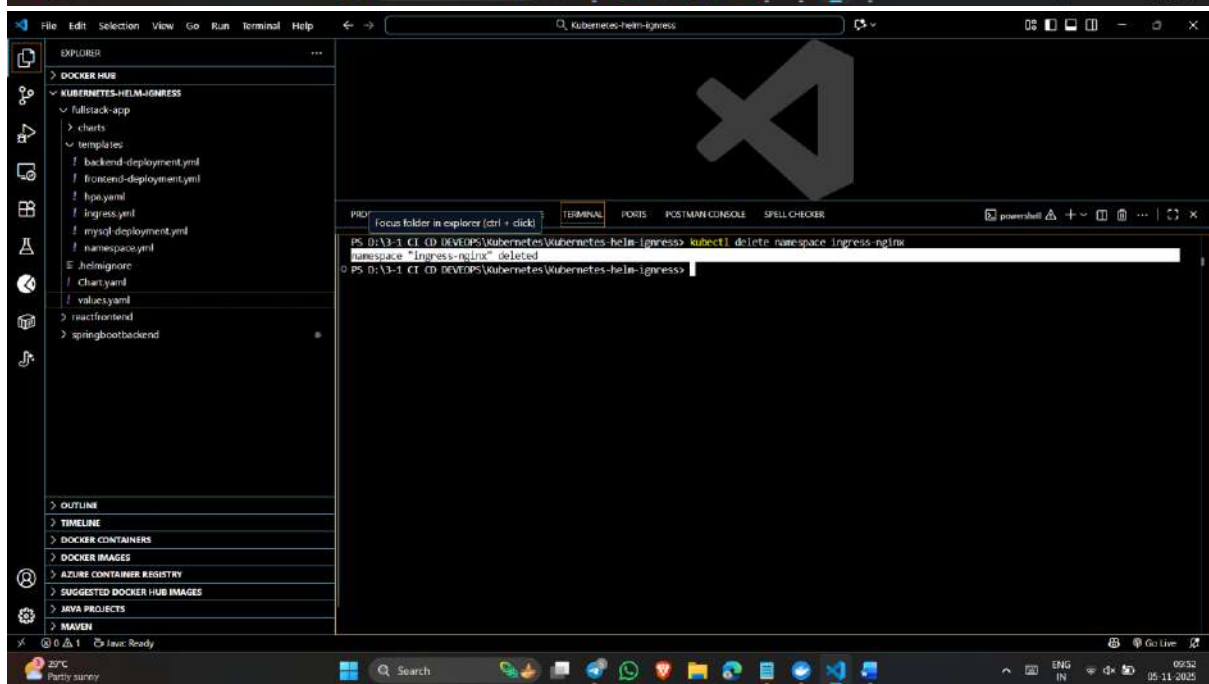
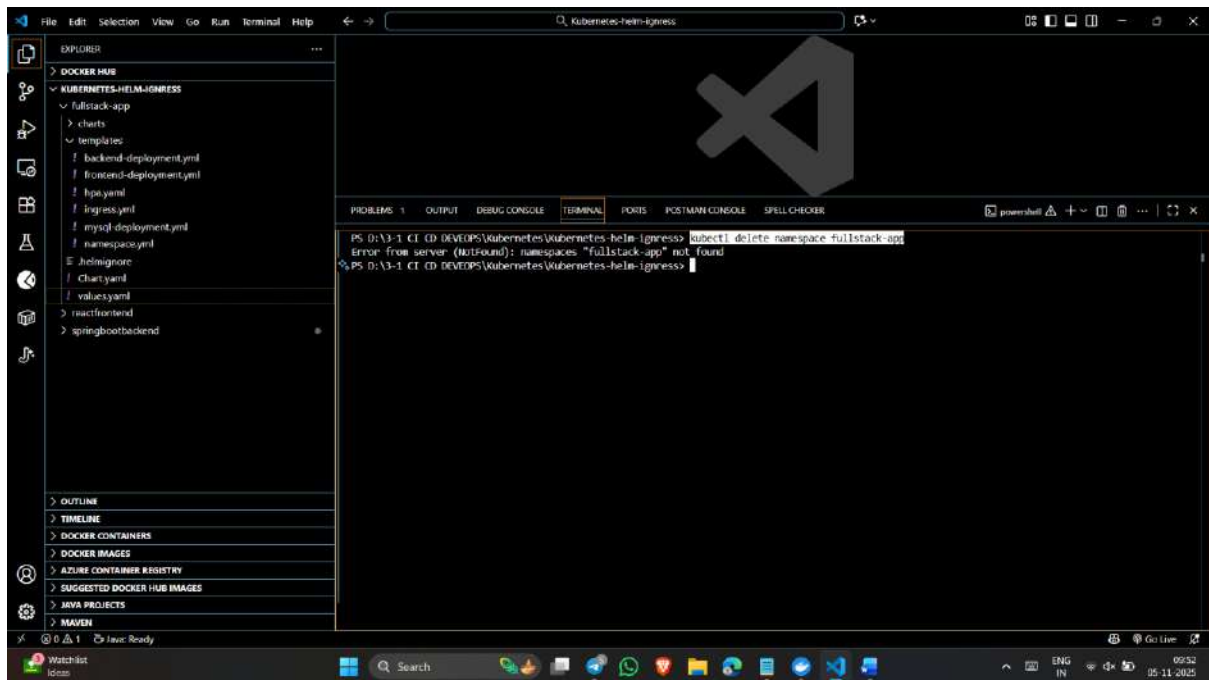
EXPLORER
DOCKERR HUB
KUBERNETES-HELM-IGNRESS
fullstack-app
charts
templates
backend-deployment.yml
frontend-deployment.yml
hpax.yml
ingress.yml
mysql-deployment.yml
namespace.yml
E Jolainignore
Chart.yml
values.yml
reactfrontend
springbootbackend

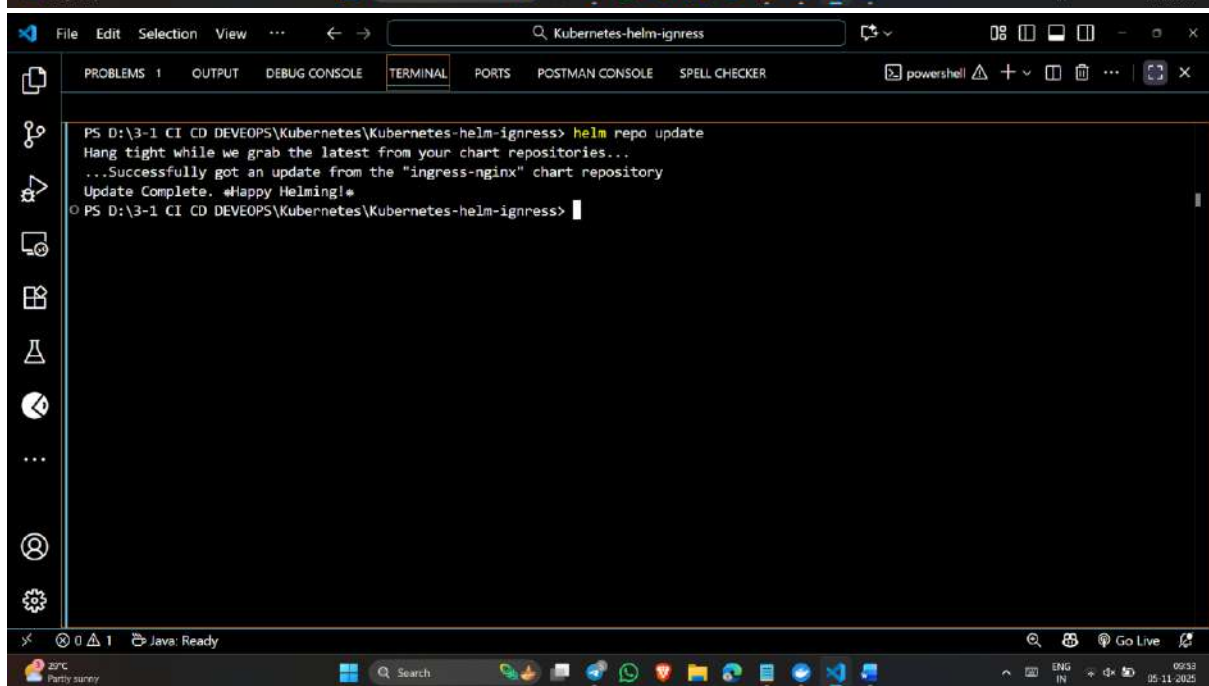
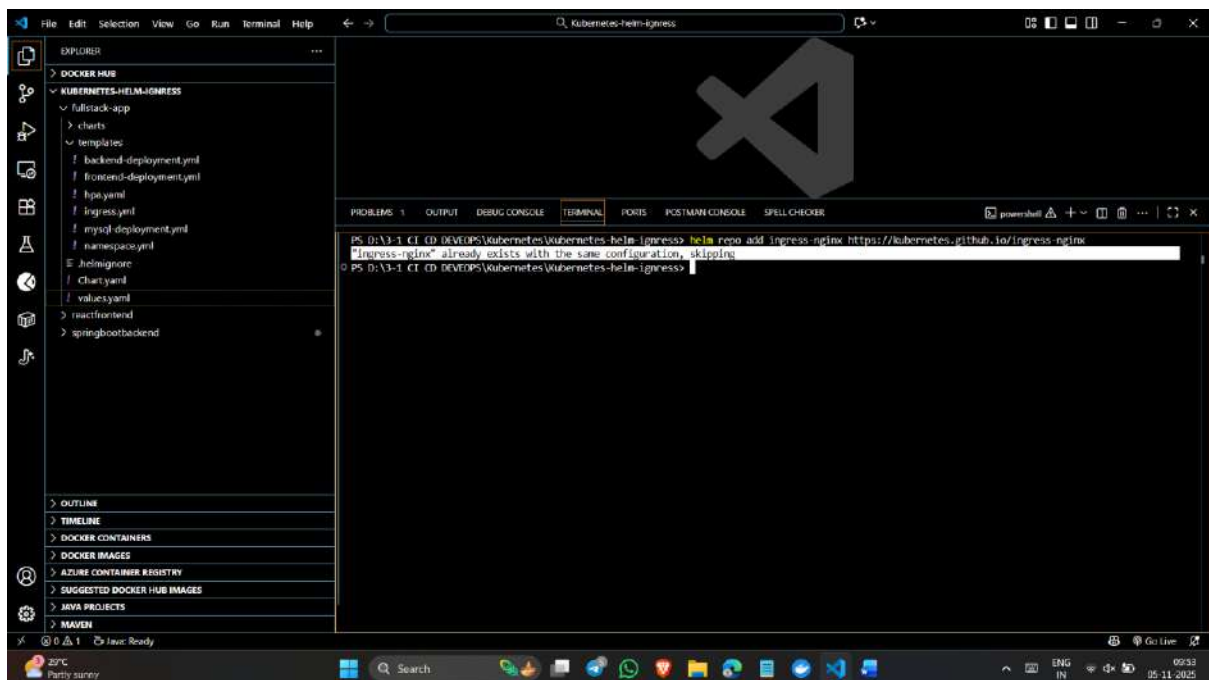
OUTLINE
TIMELINE
DOCKERR CONTAINERS
DOCKERR IMAGES
AZURE CONTAINER REGISTRY
SUGGESTED DOCKERR HUB IMAGES
JAVA PROJECTS
MAVEN

PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress\reactfrontend> docker push neeraj2005/ks-frontent:latest
The push refers to repository [docker.io/neeraj2005/ks-frontent]
8a27924f5518: Pushed
621251978ed7: Layer already exists
76c9bca4163: Layer already exists
0018b6d0202e: Pushed
2d35d4f579de: Layer already exists
7f80c7f28dc: Layer already exists
02d0e0d3699d: Layer already exists
01e03548f709: Layer already exists
f80ab0950ead: Layer already exists
83ca83c906ad: Layer already exists
latest: digest: sha256:2c42242211700007242d2154cb4e0108e91a5cad89940313195e0f3877e940 size: 2483
PS D:\3-1 CI CD DEVOPS\kubernetes\kubernetes-helm-ignress\reactfrontend>
```









```
File Edit Selection View ... Kubernetes-helm-ignress
TERMINAL
PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ignress> helm repo list
NAME          URL
ingress-nginx https://kubernetes.github.io/ingress-nginx
PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ignress>
```

```
File Edit Selection View ... Kubernetes-helm-ignress
TERMINAL
PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ignress> helm install ingress-nginx ingress-nginx/ingress-nginx --create-namespace --namespace ingress-nginx
level=WARN msg="unable to find exact version; falling back to closest available version" chart=ingress-nginx requested="" selected=4.1.4.0
NAME: ingress-nginx
LAST DEPLOYED: Wed Nov 5 10:01:01 2025
NAMESPACE: ingress-nginx
STATUS: deployed
REVISION: 1
DESCRIPTION: Install complete
TEST SUITE: None
NOTES:
The ingress-nginx controller has been installed.
It may take a few minutes for the load balancer IP to be available.
You can watch the status by running 'kubectl get service --namespace ingress-nginx ingress-nginx-controller --output wide --watch'

An example Ingress that makes use of the controller:
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: example
  namespace: foo
spec:
  ingressClassName: nginx
  rules:
  - host: www.example.com
```

The image shows a Windows environment with Visual Studio Code open. The top editor pane displays a YAML configuration for an Ingress resource. The configuration includes a path for exampleService, TLS settings for www.example.com, and a Secret for the TLS certificate and key. The bottom editor pane shows the terminal output of a Helm upgrade command for ingress-nginx. The output indicates a successful upgrade to version 4.14.0, showing details like the release name, namespace, status, and a sample Ingress manifest.

```
paths:
  - pathType: Prefix
    backend:
      service:
        name: exampleService
        port:
          number: 80
    path: /
# This section is only required if TLS is to be enabled for the Ingress
tls:
  - hosts:
    - www.example.com
      secretName: example-tls

If TLS is enabled for the Ingress, a Secret containing the certificate and key must also be provided:

apiVersion: v1
kind: Secret
metadata:
  name: example-tls
  namespace: foo
data:
  tls.crt: <base64 encoded cert>
  tls.key: <base64 encoded key>
type: kubernet.es.io/tls
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress>
```

```
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> helm upgrade ingress-nginx ingress-nginx/ingress-nginx --namespace ingress-nginx
level=WARN msg="unable to find exact version; falling back to closest available version" chart=ingress-nginx requested="" selected=4.14.0
Release "ingress-nginx" has been upgraded. Happy Helming!
NAME: ingress-nginx
LAST DEPLOYED: Wed Nov 5 10:04:50 2025
NAMESPACE: ingress-nginx
STATUS: deployed
REVISION: 2
DESCRIPTION: Upgrade complete
TEST SUITE: None
NOTES:
The ingress-nginx controller has been installed.
It may take a few minutes for the load balancer IP to be available.
You can watch the status by running 'kubectl get service --namespace ingress-nginx ingress-nginx-controller --output wide --watch'

An example Ingress that makes use of the controller:
apiVersion: networking.k8s.io/v1
kind: Ingress
metadata:
  name: example
  namespace: foo
spec:
  ingressClassName: nginx
  rules:
    - host: www.example.com
      http:
        paths:
          - pathType: Prefix
            backend:
              service:
                name: exampleService
                port:
                  number: 80
```

The image shows two screenshots of the Visual Studio Code (VS Code) interface, demonstrating the deployment and verification of a Kubernetes Ingress resource using Helm.

Top Screenshot: The **TERMINAL** tab is active, showing the YAML configuration for an Ingress resource named `example` in the `foo` namespace. The configuration includes an `nginx` ingress class and a rule for `www.example.com` that routes traffic to the `exampleService` on port `80`. A comment indicates that the `tls` section is only required if TLS is enabled. The `tls` section is defined with hosts `www.example.com` and a secret named `example-tls`. Below the Ingress configuration, a note states: "If TLS is enabled for the Ingress, a Secret containing the certificate and key must also be provided:". The Secret configuration is shown with `apiVersion: v1`, `kind: Secret`, and `type: Kubernetes.io/tls`. The `data` field contains `tls.crt` and `tls.key`, both represented as base64 encoded strings. The terminal prompt is `PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress>`.

Bottom Screenshot: The **TERMINAL** tab shows the command `kubectl get pods -n ingress-nginx` being executed. The output displays a single pod, `ingress-nginx-controller-668c4fc947-9v8n4`, which is in the `Running` state. The terminal prompt is `PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress>`.

docker desktop PERSONAL Search Ctrl+K

Containers [View testback](#)

Container CPU usage 0.28% / 1200% (11 CPUs available) Container memory usage 135.4MB / 7.42GB [Show charts](#)

Search Only show running containers

Name	Container ID	Image	Port(s)	CPU (%)	Last started	Actions
k8s_controller_ingress-n	f3008f651cbb	e4127065d031		0.17%	5 minutes ago	

Showing 1 item

Engine running | Kubernetes running RAM 6.14 GB CPU 5.67% Disk: 19.53 GB used (limit 1006.65 GB) Terminal [New version available](#)

zrc Party sunny

File Edit Selection View Go Run ... Kubernetes-helm-ingress

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

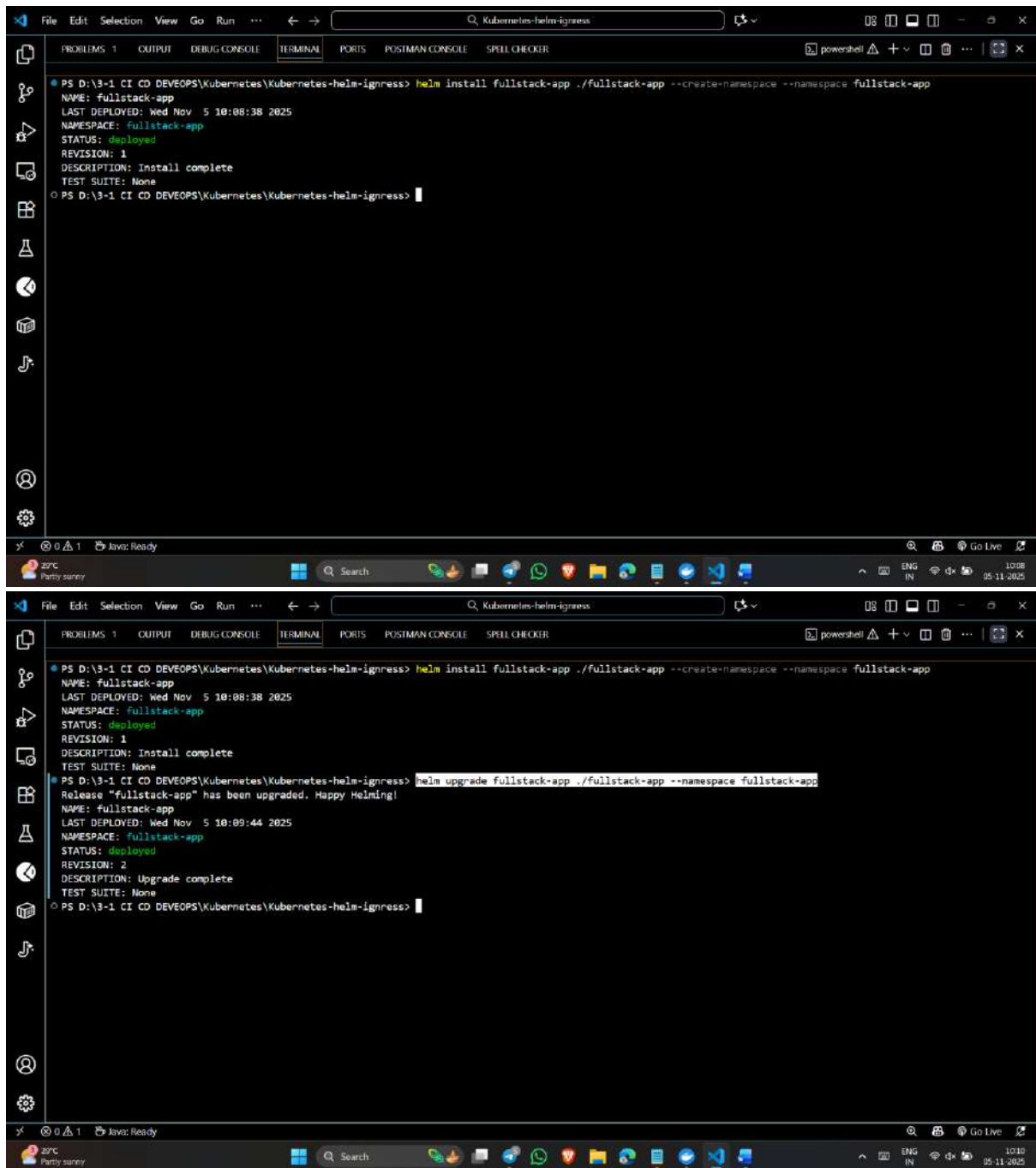
ingress-nginx-controller-668c4fc947-9v8n4 1/1 Running 0 4m48s
PS D:\3-1 CI CD DEV\OPS\Kubernetes\Kubernetes-helm-ingress> kubectl logs -f ingress-nginx-controller-668c4fc947-9v8n4 -n ingress-nginx

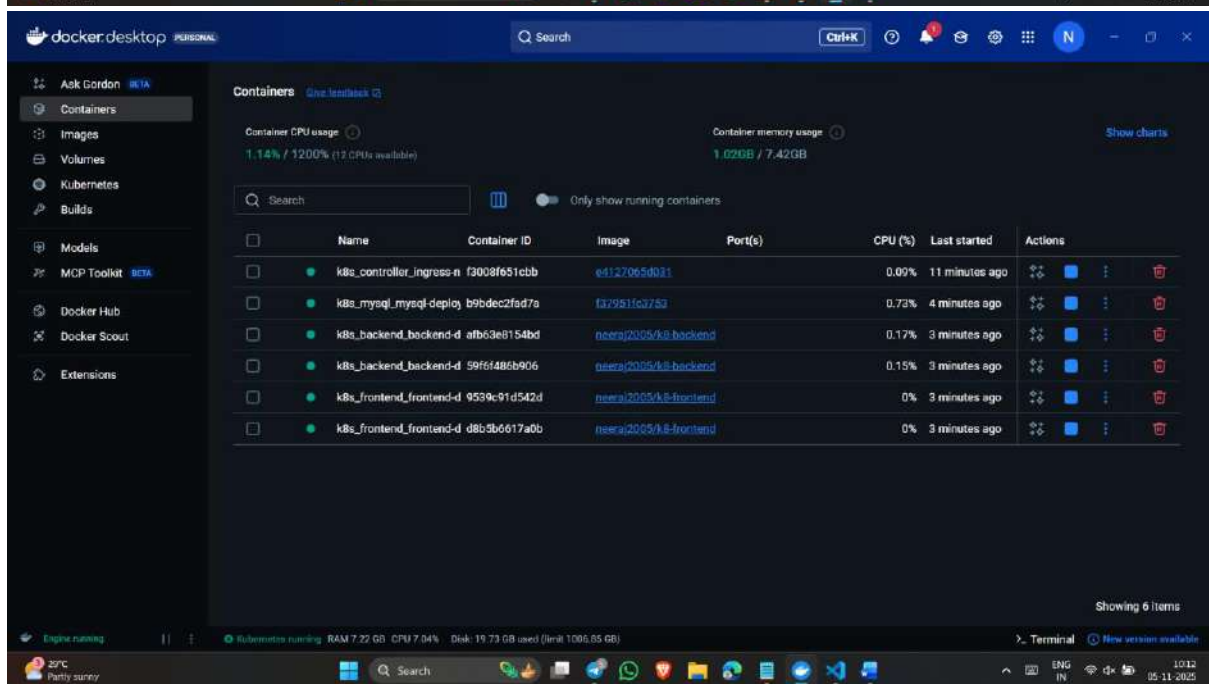
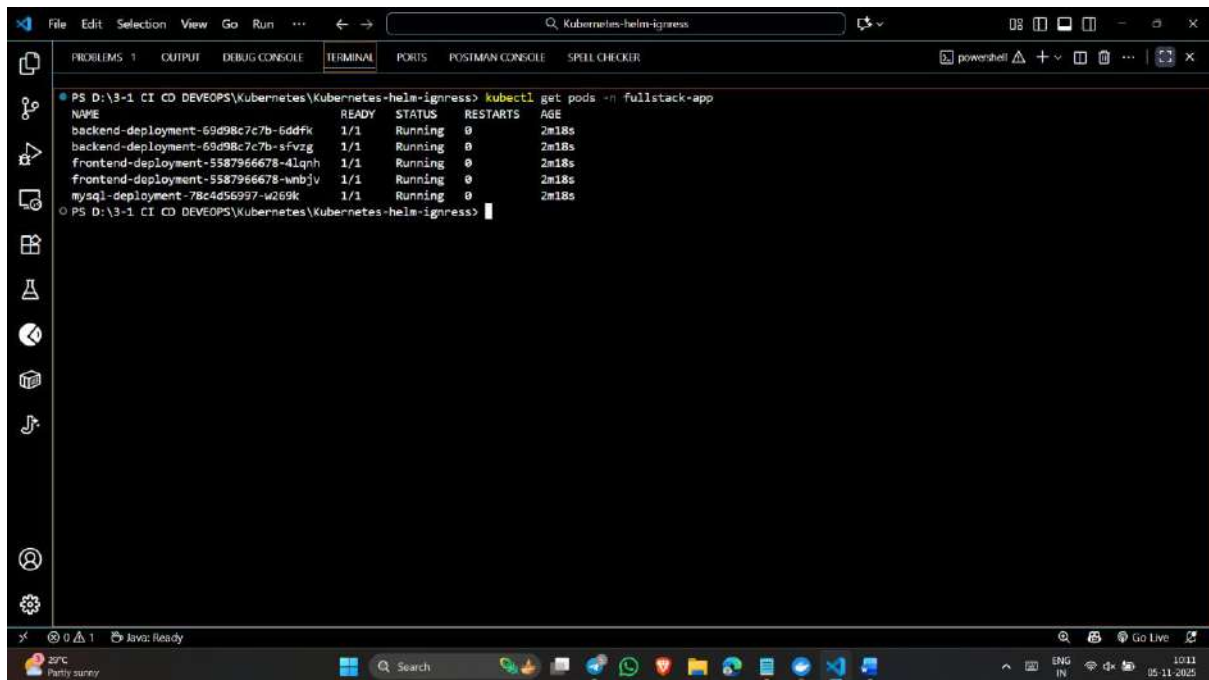
NGINX Ingress controller
Release: v1.14.0
Build: 52c8a83ac9bc72e9ce1b9fe4f2d6dcc8854516a8
Repository: https://github.com/kubernetes/ingress-nginx
nginx version: nginx/1.27.1

W1105 04:31:07.344428 7 client_config.go:667] Neither --kubeconfig nor --master was specified. Using the inClusterConfig. This might not work.
I1105 04:31:07.344651 7 main.go:285] "Creating API client" host="https://10.96.0.1:443"
I1105 04:31:07.351515 7 main.go:248] "Running in Kubernetes cluster" major="1" minor="32" git="v1.32.2" state="clean" commit="67a30c0adcf52bd3f56ff8893ce19966be12991f" platform="linux/amd64"
I1105 04:31:07.434728 7 main.go:181] "SSL fake certificate created" file="/etc/ingress-controller/ssl/default-fake-certificate.pem"
I1105 04:31:07.446287 7 ssl.go:535] "loading tls certificate" path="/usr/local/certificates/cert" key="/usr/local/certificates/key"
I1105 04:31:07.453894 7 nginx.go:273] "Starting NGINX Ingress controller"
I1105 04:31:07.461396 7 event.go:377] Event(v1.ObjectReference{Kind:"ConfigMap", Namespace:"ingress-nginx", Name:"ingress-nginx-controller", UID:"c252536e-e99a-4413-9f92-c102fdb4c8f5"}, APIVersion:"v1", ResourceVersion:"158868", FieldPath:""}): type: 'Normal' reason: 'CREATE' ConfigMap ingress-nginx/ingress-nginx-controller
I1105 04:31:09.570720 7 nginx.go:319] "Starting NGINX process"
I1105 04:31:09.571032 7 leaderelection.go:257] attempting to acquire leader lease ingress-nginx/ingress-nginx-leader...
I1105 04:31:09.571236 7 nginx.go:339] "Starting validation webhook" address=":8443" certPath="/usr/local/certificates/cert" keyPath="/usr/local/certificates/key"
I1105 04:31:09.571754 7 controller.go:214] "Configuration changes detected, backend reload required"
I1105 04:31:09.580643 7 leaderelection.go:271] successfully acquired lease ingress-nginx/ingress-nginx-leader
I1105 04:31:09.580735 7 status.go:85] "New leader elected" identity="ingress-nginx-controller-668c4fc947-9v8n4"
I1105 04:31:09.598452 7 controller.go:228] "Backend successfully reloaded"
I1105 04:31:09.598607 7 controller.go:248] "Initial sync, sleeping for 1 second"
I1105 04:31:09.598679 7 event.go:377] Event(v1.ObjectReference{Kind:"Pod", Namespace:"ingress-nginx", Name:"ingress-nginx-controller-668c4fc947-9v8n4", UID:"f5d18f42-61ad-4a28-acbc-99723edae75f"}, APIVersion:"v1", ResourceVersion:"158895", FieldPath:""}): type: 'Normal' reason: 'RELOAD' NGINX reload triggered due to a change in configuration

Java: Ready

zrc Party sunny





File Edit Selection View Go Run ... Q Kubernetes-helm-ignress

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

NAME READY STATUS RESTARTS AGE

mysql-deployment-78c4d56997-w269k 1/1 Running 0 2m18s

PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> kubectl logs -f backend-deployment-69d98c7c7b-6ddfk -n fullstack-app

Spring Boot (v3.5.6)

2025-11-05T04:38:50.533Z INFO 1 --- [springbootbackend] [main] c.klef.dev.SpringbootbackendApplication : Starting SpringbootbackendApplication v0.0.1-SNAPSHOT using Java 21.0.8 with PID 1 (/app/app.jar started by root in /app)

2025-11-05T04:38:50.605Z INFO 1 --- [springbootbackend] [main] c.klef.dev.SpringbootbackendApplication : No active profile set, falling back to 1 default profile: "default"

2025-11-05T04:38:55.192Z INFO 1 --- [springbootbackend] [main] s.d.r.c.RepositoryConfigurationDelegate : Bootstrapping Spring Data JPA repositories in DEFAULT mode.

2025-11-05T04:38:55.401Z INFO 1 --- [springbootbackend] [main] s.d.r.c.RepositoryConfigurationDelegate : Finished Spring Data repository scanning in 198 ms. Found 1 JPA repository interface.

2025-11-05T04:38:57.812Z INFO 1 --- [springbootbackend] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat initialized with port 2000 (http)

2025-11-05T04:38:57.880Z INFO 1 --- [springbootbackend] [main] o.apache.catalina.core.StandardService : Starting service [Tomcat]

2025-11-05T04:38:57.980Z INFO 1 --- [springbootbackend] [main] o.apache.catalina.core.StandardEngine : Starting Servlet engine: [Apache Tomcat/10.1.46]

2025-11-05T04:38:58.675Z INFO 1 --- [springbootbackend] [main] o.a.c.c.C.[Tomcat].[localhost].[/] : Initializing Spring embedded WebApplicationContext

2025-11-05T04:38:58.680Z INFO 1 --- [springbootbackend] [main] w.s.c.ServletWebServerApplicationContext : Root WebApplicationContext: initialization completed in 7853 ms

2025-11-05T04:39:01.392Z INFO 1 --- [springbootbackend] [main] o.hibernate.jpa.internal.util.LogHelper : HHH000204: Processing PersistenceUnitInfo [name: default]

2025-11-05T04:39:01.983Z INFO 1 --- [springbootbackend] [main] org.hibernate.Version : HHH000412: Hibernate ORM core version 6.6.29.Final

2025-11-05T04:39:02.390Z INFO 1 --- [springbootbackend] [main] o.h.c.internal.RegionFactoryInitiator : HHH00026: Second-level cache disabled

PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> kubectl logs -f backend-deployment-69d98c7c7b-6ddfk -n fullstack-app

at org.springframework.boot.SpringApplication.run(SpringApplication.java:1361) ~[spring-boot-3.5.6.jar!/3.5.6]

at org.springframework.boot.SpringApplication.run(SpringApplication.java:1350) ~[spring-boot-3.5.6.jar!/3.5.6]

at com.klef.dev.SpringbootbackendApplication.main(SpringbootbackendApplication.java:11) ~[/:0.0.1-SNAPSHOT]

at java.base/jdk.internal.reflect.DirectMethodHandleAccessor.invoke(DirectMethodHandleAccessor.java:103) ~[na:na]

at java.base/java.lang.reflect.Method.invoke(Method.java:580) ~[na:na]

at org.springframework.boot.loader.launch.Launcher.launch(Launcher.java:102) ~[app.jar:0.0.1-SNAPSHOT]

at org.springframework.boot.loader.launch.Launcher.launch(Launcher.java:64) ~[app.jar:0.0.1-SNAPSHOT]

at org.springframework.boot.loader.launch.JarLauncher.main(JarLauncher.java:40) ~[app.jar:0.0.1-SNAPSHOT]

Caused by: java.sql.SQLException: Table 'task_table' already exists

at com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:112) ~[mysql-connector-j-9.4.0.jar!/9.4.0]

at com.mysql.cj.jdbc.exceptions.SQLExceptionsMapping.translateException(SQLExceptionsMapping.java:114) ~[mysql-connector-j-9.4.0.jar!/9.4.0]

at com.mysql.cj.jdbc.StatementImpl.executeInternal(StatementImpl.java:837) ~[mysql-connector-j-9.4.0.jar!/9.4.0]

at com.mysql.cj.jdbc.StatementImpl.execute(StatementImpl.java:685) ~[mysql-connector-j-9.4.0.jar!/9.4.0]

at com.zaxxer.hikari.pool.ProxyStatement.execute(ProxyStatement.java:95) ~[HikariCP-6.3.3.jar!/na]

at com.zaxxer.hikari.pool.HikariProxyStatement.execute(HikariProxyStatement.java) ~[HikariCP-6.3.3.jar!/na]

at org.hibernate.tool.schema.internal.exec.GenerationTargetToDatabase.accept(GenerationTargetToDatabase.java:80) ~[hibernate-core-6.6.29.Final.jar!/6.6.29.Final]

... 42 common frames omitted

2025-11-05T04:39:10.595Z INFO 1 --- [springbootbackend] [main] j.LocalContainerEntityManagerFactoryBean : Initialized JPA EntityManagerFactory for persistence unit 'default'

2025-11-05T04:39:12.095Z WARN 1 --- [springbootbackend] [main] JpaBaseConfiguration\$JpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, database queries may be performed during view rendering. Explicitly configure spring.jpa.open-in-view to disable this warning

2025-11-05T04:39:12.296Z INFO 1 --- [springbootbackend] [main] o.s.v.b.OptionalValidatorFactoryBean : Failed to set up a Bean Validation provider: jakarta.validation.NoProviderFoundException: Unable to create a Configuration, because no Jakarta Bean Validation provider could be found. Add a provider like Hibernate Validator (RI) to your classpath.

2025-11-05T04:39:14.093Z INFO 1 --- [springbootbackend] [main] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 2000 (http) with context path '/'

2025-11-05T04:39:14.194Z INFO 1 --- [springbootbackend] [main] c.klef.dev.SpringbootbackendApplication : Started SpringbootbackendApplication in 27.369 seconds (process running for 30.574)

Project Backend is Running Successfully

zxc Party sunny

ENG IN 1015 05-11-2025

VS Code interface showing a terminal window with the following commands and output:

```
PS D:\3-1 CI CD\DEVOPS\Kubernetes\Kubernetes-helm-ignress> helm list -n fullstack-app
```

NAME	NAMESPACE	REVISION	UPDATED	STATUS	CHART	APP VERSION
fullstack-app	fullstack-app	2	2025-11-05 10:09:44.5437061 +0530 IST	deployed	fullstack-app-1.0.0	1.0

```
PS D:\3-1 CI CD\DEVOPS\Kubernetes\Kubernetes-helm-ignress>
```



```
PS D:\3-1 CI CD\DEVOPS\Kubernetes\Kubernetes-helm-ignress> kubectl get svc -n fullstack-app
```

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
backend-deployment-service	NodePort	10.99.183.110	<none>	2000:30025/TCP	9m16s
frontend-deployment-service	NodePort	10.103.242.133	<none>	80:30080/TCP	9m16s
mysql-service	ClusterIP	10.99.3.3	<none>	3306/TCP	9m16s

```
PS D:\3-1 CI CD\DEVOPS\Kubernetes\Kubernetes-helm-ignress>
```

The interface also shows the Windows taskbar at the bottom with the time 10:17 and date 05-11-2025.

```
File Edit Selection View Go Run ... Kubernetes-helm-ignress
PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER
PS D:\3-1 CI CD DEVOPS\Kubernetes\helm-ignress> helm status fullstack-app -n fullstack-app
NAME: fullstack-app
LAST DEPLOYED: Wed Nov 5 10:09:44 2025
NAMESPACE: fullstack-app
STATUS: deployed
REVISION: 2
DESCRIPTION: Upgrade complete
RESOURCES:
==> v1/Namespace
NAME STATUS AGE
fullstack-app Active 10m

==> v1/Service
NAME TYPE CLUSTER-IP EXTERNAL-IP PORT(S) AGE
backend-deployment-service NodePort 10.99.183.110 <none> 2000:30025/TCP 10m
frontend-deployment-service NodePort 10.103.242.133 <none> 80:30080/TCP 10m
mysql-service ClusterIP 10.99.3.3 <none> 3306/TCP 10m

==> v1/Deployment
NAME READY UP-TO-DATE AVAILABLE AGE
backend-deployment 2/2 2 2 10m
frontend-deployment 2/2 2 2 10m
mysql-deployment 1/1 1 1 10m

==> v1/Pod(related)
NAME READY STATUS RESTARTS AGE
backend-deployment-69d98c7c7b-6ddfk 1/1 Running 0 10m
backend-deployment-69d98c7c7b-sfvzg 1/1 Running 0 10m
frontend-deployment-5587966678-4lqnh 1/1 Running 0 10m
frontend-deployment-5587966678-mnbjv 1/1 Running 0 10m
mysql-deployment-78c4d96997-w269k 1/1 Running 0 10m

==> v2/HorizontalPodAutoscaler
PAK SA Game score
10719
05-11-2025
```

File Edit Selection View Go Run ... ← → Q Kubernetes-helm-ignress

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

DESCRIPTION: Upgrade complete

RESOURCES:

==> v1/Namespace

NAME	STATUS	AGE
fullstack-app	Active	10m

==> v1/Service

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
backend-deployment-service	NodePort	10.99.183.110	<none>	2000:30025/TCP	10m
frontend-deployment-service	NodePort	10.183.242.133	<none>	80:30080/TCP	10m
mysql-service	ClusterIP	10.99.3.3	<none>	3306/TCP	10m

==> v1/Deployment

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
backend-deployment	2/2	2	2	10m
frontend-deployment	2/2	2	2	10m
mysql-deployment	1/1	1	1	10m

==> v1/Pod(related)

NAME	READY	STATUS	RESTARTS	AGE
backend-deployment-65d98c7c7b-6ddfk	1/1	Running	0	10m
backend-deployment-65d98c7c7b-sfvzg	1/1	Running	0	10m
frontend-deployment-5587966678-4lqnh	1/1	Running	0	10m
frontend-deployment-5587966678-wnbjv	1/1	Running	0	10m
mysql-deployment-78c4d56997-w269k	1/1	Running	0	10m

==> v2/HorizontalPodAutoscaler

NAME	REFERENCE	TARGETS	MINPODS	MAXPODS	REPLICAS	AGE
backend-deployment-hpa	Deployment/backend-deployment	cpu: <unknown>/50%	2	5	2	10m
frontend-deployment-hpa	Deployment/frontend-deployment	cpu: <unknown>/50%	2	5	2	10m

==> v1/Ingress

NAME	CLASS	HOSTS	ADDRESS	PORTS	AGE
------	-------	-------	---------	-------	-----

PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> helm get manifest fullstack-app -n fullstack-app

```
---
# Source: fullstack-app/templates/namespace.yml
apiVersion: v1
kind: Namespace
metadata:
  name: fullstack-app
---
# Source: fullstack-app/templates/backend-deployment.yml
apiVersion: v1
kind: Service
metadata:
  name: backend-deployment-service
  namespace: fullstack-app
spec:
  selector:
    app: backend-deployment
  ports:
    - protocol: TCP
      port: 2000
      targetPort: 2000
      nodePort: 30025
  type: NodePort
---
# Source: fullstack-app/templates/frontend-deployment.yml
apiVersion: v1
kind: Service
metadata:
  name: frontend-deployment-service
  namespace: fullstack-app
spec:
  selector:
    app: frontend-deployment
```

File Edit Selection View Go Run ... ← → Q Kubernetes-helm-ignress

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

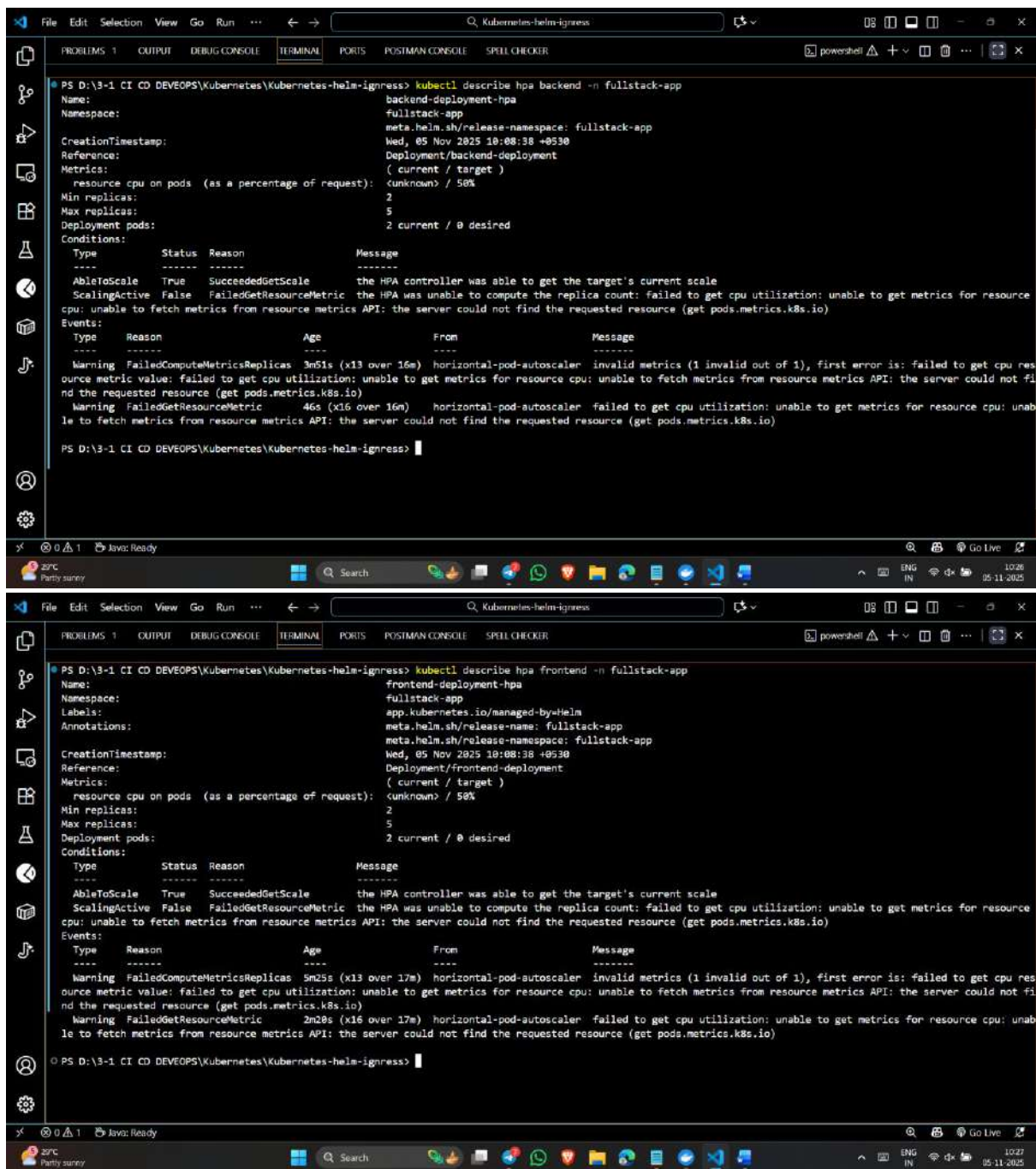
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> helm get manifest fullstack-app -n fullstack-app

```
---
# Source: fullstack-app/templates/namespace.yml
apiVersion: v1
kind: Namespace
metadata:
  name: fullstack-app
---
# Source: fullstack-app/templates/backend-deployment.yml
apiVersion: v1
kind: Service
metadata:
  name: backend-deployment-service
  namespace: fullstack-app
spec:
  selector:
    app: backend-deployment
  ports:
    - protocol: TCP
      port: 2000
      targetPort: 2000
      nodePort: 30025
  type: NodePort
---
# Source: fullstack-app/templates/frontend-deployment.yml
apiVersion: v1
kind: Service
metadata:
  name: frontend-deployment-service
  namespace: fullstack-app
spec:
  selector:
    app: frontend-deployment
```

```
File Edit Selection View Go Run ... Kubernetes-helm-ignress
PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> helm history fullstack-app -n fullstack-app
REVISION      UPDATED              STATUS      CHART              APP VERSION      DESCRIPTION
1             Wed Nov 5 10:08:38 2025  superseded  fullstack-app-1.0.0  1.0              Install complete
2             Wed Nov 5 10:09:44 2025  deployed   fullstack-app-1.0.0  1.0              Upgrade complete
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress>
```

```
File Edit Selection View Go Run ... Kubernetes-helm-ignress
PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress> kubectl get hpa -n fullstack-app
NAME                                REFERENCE                                TARGETS      MINPODS  MAXPODS  REPLICAS  AGE
backend-deployment-hpa             Deployment/backend-deployment             cpu: <unknown>/50%    2         5         2          16m
frontend-deployment-hpa            Deployment/frontend-deployment             cpu: <unknown>/50%    2         5         2          16m
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ignress>
```


Horizontal pod autoscaling



The image displays two screenshots of a Visual Studio Code terminal window, showing the output of the `kubectl describe hpa` command for two different deployments: `backend` and `frontend`.

Top Screenshot: `backend` deployment

```
PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ignress> kubectl describe hpa backend -n fullstack-app
Name:
backend-deployment-hpa
Namespace:
fullstack-app
CreationTimestamp:
Wed, 05 Nov 2025 10:08:38 +0530
Reference:
Deployment/backend-deployment
Metrics:
  resource cpu on pods (as a percentage of request): (unknown) / 50%
Min replicas:
2
Max replicas:
5
Deployment pods:
2 current / 0 desired
Conditions:
  Type             Status  Reason
  ----             -
  AbleToScale      True    SucceededGetScale
ScalingActive      False   FailedGetResourceMetric
the HPA was unable to compute the replica count: failed to get cpu utilization: unable to get metrics for resource
cpu: unable to fetch metrics from resource metrics API: the server could not find the requested resource (get pods.metrics.k8s.io)
Events:
  Type             Reason              Age             From             Message
  ----             -
  Warning          FailedComputeMetricsReplicas  3m51s (x13 over 16m)  horizontal-pod-autoscaler  invalid metrics (1 invalid out of 1), first error is: failed to get cpu res
ource metric value: failed to get cpu utilization: unable to get metrics for resource cpu: unable to fetch metrics from resource metrics API: the server could not fi
nd the requested resource (get pods.metrics.k8s.io)
  Warning          FailedGetResourceMetric        46s (x16 over 16m)    horizontal-pod-autoscaler  failed to get cpu utilization: unable to get metrics for resource cpu: unab
le to fetch metrics from resource metrics API: the server could not find the requested resource (get pods.metrics.k8s.io)
```

Bottom Screenshot: `frontend` deployment

```
PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ignress> kubectl describe hpa frontend -n fullstack-app
Name:
frontend-deployment-hpa
Namespace:
fullstack-app
Labels:
  app.kubernetes.io/managed-by=Helm
Annotations:
  meta.helm.sh/release-name: fullstack-app
  meta.helm.sh/release-namespace: fullstack-app
CreationTimestamp:
Wed, 05 Nov 2025 10:08:38 +0530
Reference:
Deployment/frontend-deployment
Metrics:
  resource cpu on pods (as a percentage of request): (unknown) / 50%
Min replicas:
2
Max replicas:
5
Deployment pods:
2 current / 0 desired
Conditions:
  Type             Status  Reason
  ----             -
  AbleToScale      True    SucceededGetScale
ScalingActive      False   FailedGetResourceMetric
the HPA was unable to compute the replica count: failed to get cpu utilization: unable to get metrics for resource
cpu: unable to fetch metrics from resource metrics API: the server could not find the requested resource (get pods.metrics.k8s.io)
Events:
  Type             Reason              Age             From             Message
  ----             -
  Warning          FailedComputeMetricsReplicas  5m25s (x13 over 17m)  horizontal-pod-autoscaler  invalid metrics (1 invalid out of 1), first error is: failed to get cpu res
ource metric value: failed to get cpu utilization: unable to get metrics for resource cpu: unable to fetch metrics from resource metrics API: the server could not fi
nd the requested resource (get pods.metrics.k8s.io)
  Warning          FailedGetResourceMetric        2m20s (x16 over 17m)    horizontal-pod-autoscaler  failed to get cpu utilization: unable to get metrics for resource cpu: unab
le to fetch metrics from resource metrics API: the server could not find the requested resource (get pods.metrics.k8s.io)
```

VS Code interface showing two terminal sessions for Kubernetes Helm ingress.

Terminal 1 (Top):

```
PS D:\3-1 CI CD\DEVOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get hpa -n fullstack-app -w
```

NAME	REFERENCE	TARGETS	MINPODS	MAXPODS	REPLICAS	AGE
backend-deployment-hpa	Deployment/backend-deployment	cpu: <unknown>/50%	2	5	2	19m
frontend-deployment-hpa	Deployment/frontend-deployment	cpu: <unknown>/50%	2	5	2	19m

Terminal 2 (Bottom):

```
PS D:\3-1 CI CD\DEVOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get pods -n fullstack-app
```

NAME	READY	STATUS	RESTARTS	AGE
backend-deployment-69d98c7c7b-6ddfk	1/1	Running	0	20m
backend-deployment-69d98c7c7b-sfvzg	1/1	Running	0	20m
frontend-deployment-5587966678-4lqnh	1/1	Running	0	20m
frontend-deployment-5587966678-wnbjv	1/1	Running	0	20m
mysql-deployment-78c4d56997-w269k	1/1	Running	0	20m

File Edit Selection View Go Run ...

←→

Q Kubernetes-helm-ingress

08 11 2025

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

powerShell + - ...

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get hpa -n fullstack-app -w

NAME	REFERENCE	TARGETS	MINPODS	MAXPODS	REPLICAS	AGE
backend-deployment-hpa	Deployment/backend-deployment	cpu: <unknown>/50%	2	5	2	19m
frontend-deployment-hpa	Deployment/frontend-deployment	cpu: <unknown>/50%	2	5	2	19m

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get pods -n fullstack-app

NAME	READY	STATUS	RESTARTS	AGE
backend-deployment-69d98c7c7b-6ddfk	1/1	Running	0	20m
backend-deployment-69d98c7c7b-sfvzg	1/1	Running	0	20m
frontend-deployment-5587966678-4lqnh	1/1	Running	0	20m
frontend-deployment-5587966678-nmbjv	1/1	Running	0	20m
mysql-deployment-78c4d56997-w269k	1/1	Running	0	20m

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl scale deployment backend-deployment --replicas=5 -n fullstack-app

deployment.apps/backend-deployment scaled

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress>

27°C Party sunny

Search

ENG IN 10:30 05-11-2025

File Edit Selection View Go Run ...

←→

Q Kubernetes-helm-ingress

08 11 2025

PROBLEMS 1 OUTPUT DEBUG CONSOLE TERMINAL PORTS POSTMAN CONSOLE SPELL CHECKER

powerShell + - ...

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get hpa -n fullstack-app -w

NAME	REFERENCE	TARGETS	MINPODS	MAXPODS	REPLICAS	AGE
backend-deployment-hpa	Deployment/backend-deployment	cpu: <unknown>/50%	2	5	2	19m
frontend-deployment-hpa	Deployment/frontend-deployment	cpu: <unknown>/50%	2	5	2	19m

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get pods -n fullstack-app

NAME	READY	STATUS	RESTARTS	AGE
backend-deployment-69d98c7c7b-6ddfk	1/1	Running	0	20m
backend-deployment-69d98c7c7b-sfvzg	1/1	Running	0	20m
frontend-deployment-5587966678-4lqnh	1/1	Running	0	20m
frontend-deployment-5587966678-nmbjv	1/1	Running	0	20m
mysql-deployment-78c4d56997-w269k	1/1	Running	0	20m

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl scale deployment backend-deployment --replicas=5 -n fullstack-app

deployment.apps/backend-deployment scaled

PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl scale deployment frontend-deployment --replicas=5 -n fullstack-app

deployment.apps/frontend-deployment scaled

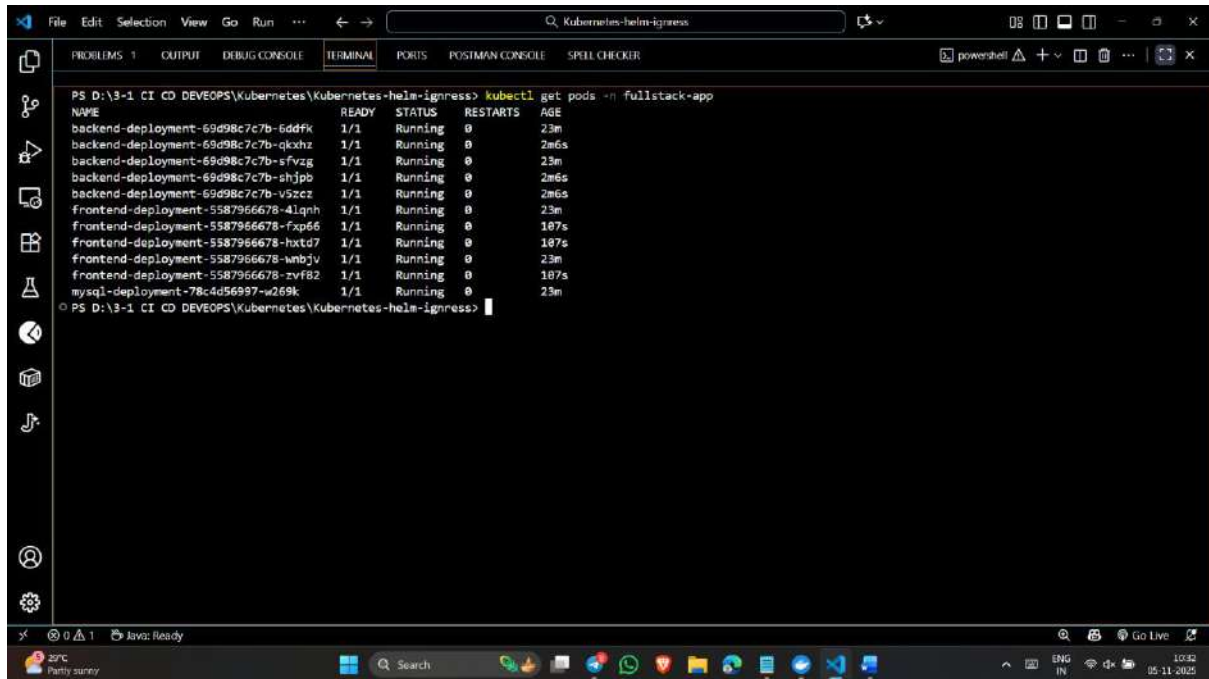
PS D:\3-1 CI CD DEVEOPS\Kubernetes\Kubernetes-helm-ingress>

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Search

ENG IN 10:30 05-11-2025

->If Image Pull back off there in the status make sure to run the command again and wait for running status

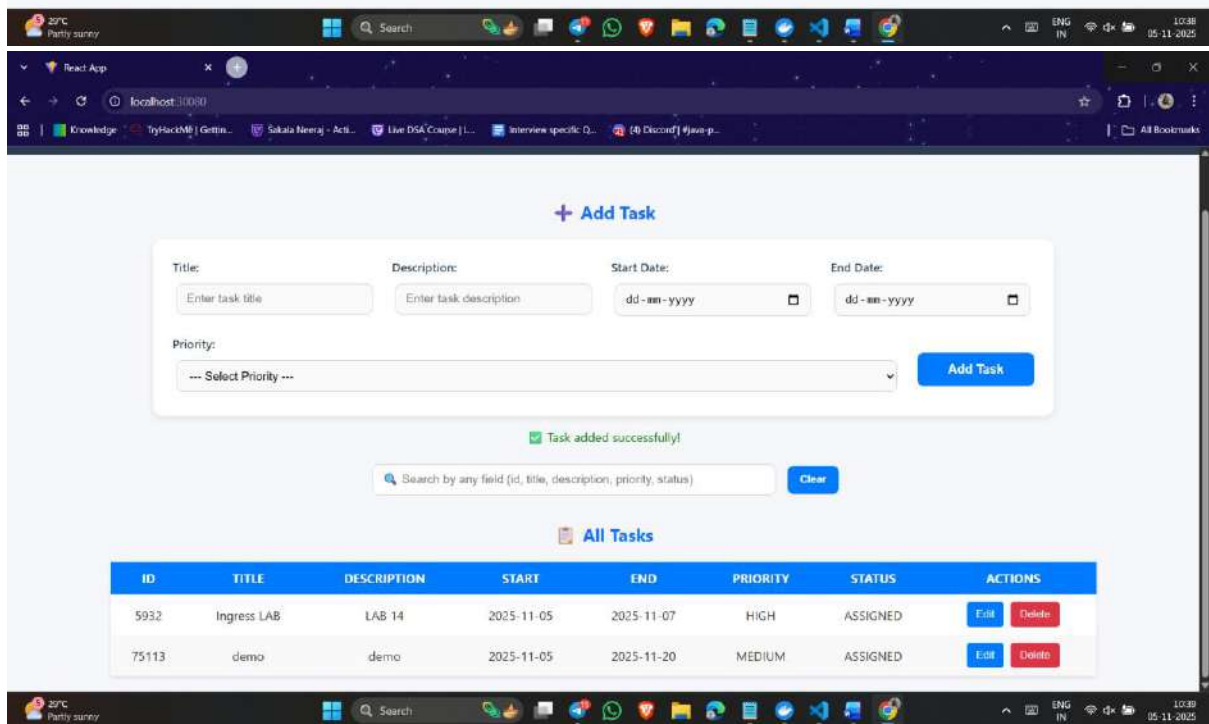
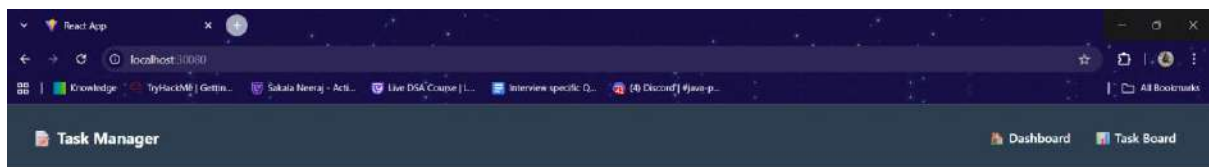


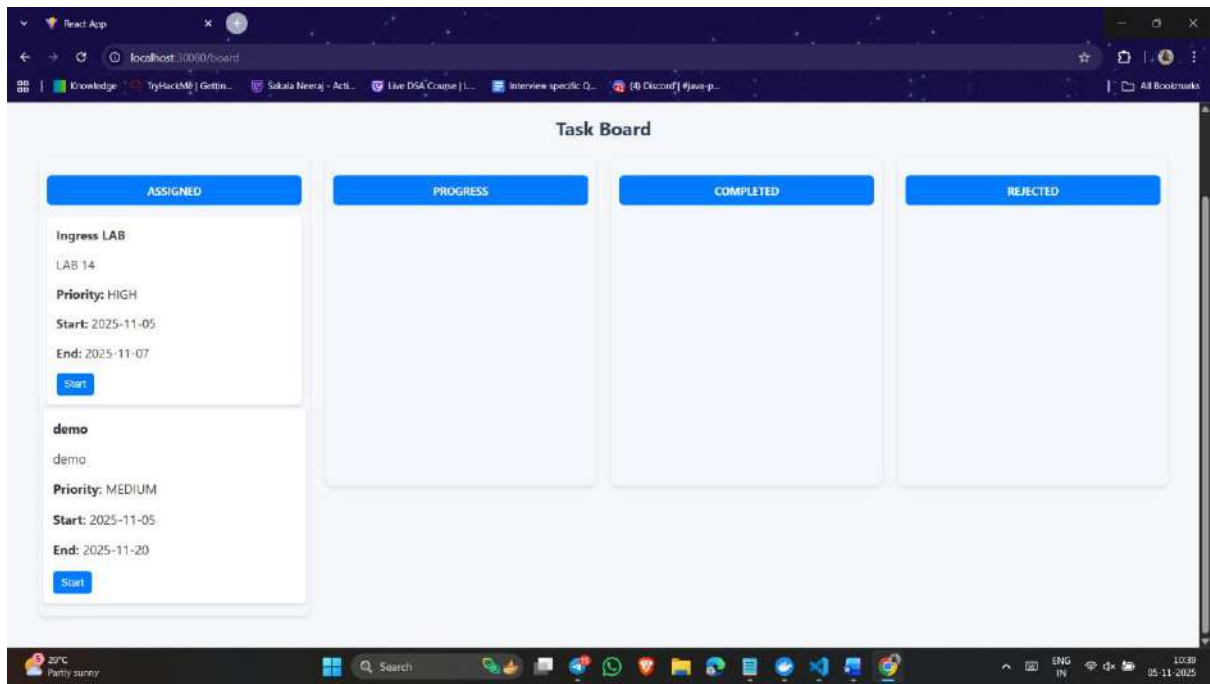
The screenshot shows a Visual Studio Code window with a terminal open. The terminal is running a PowerShell session in the directory `PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ingress>`. The user has executed the command `kubectl get pods -n fullstack-app`, which displays a table of Kubernetes pods. The table has columns for NAME, READY, STATUS, RESTARTS, and AGE. All pods are in a 'Running' state. The terminal also shows a sidebar with icons for Explorer, Search, Run and Debug, and Extensions. The bottom status bar indicates 'Java: Ready' and the system clock shows '10:32 05-11-2025'.

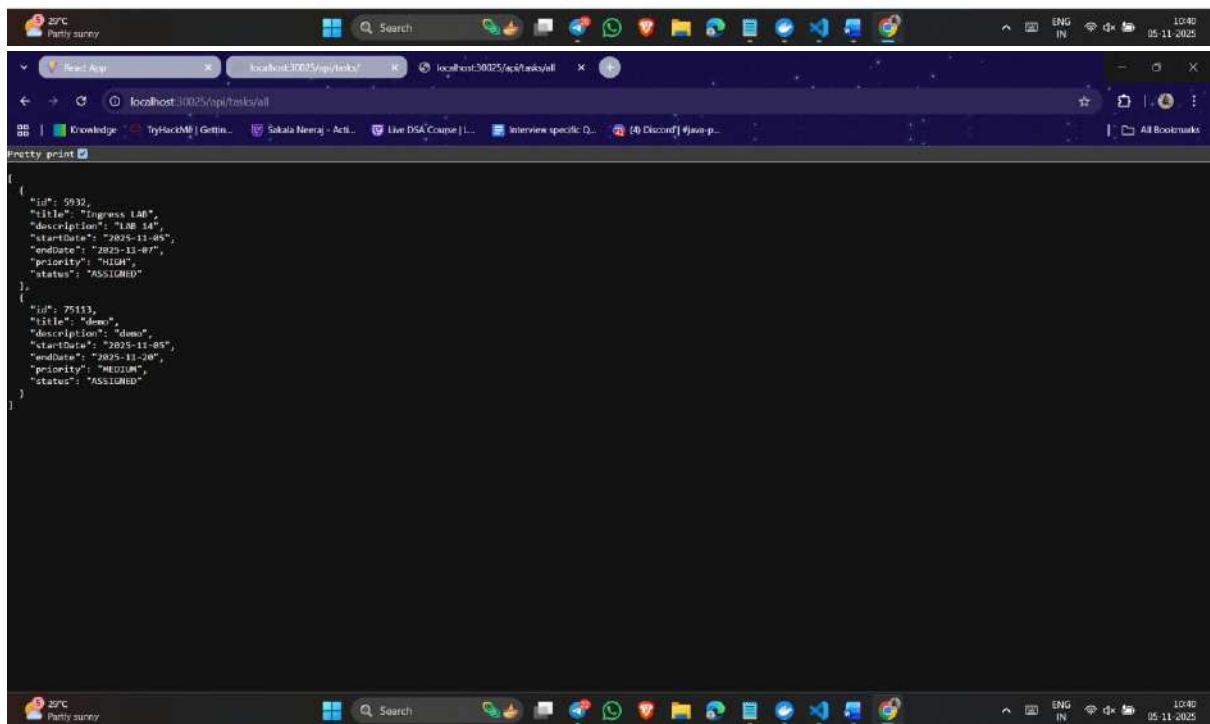
```
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ingress> kubectl get pods -n fullstack-app
```

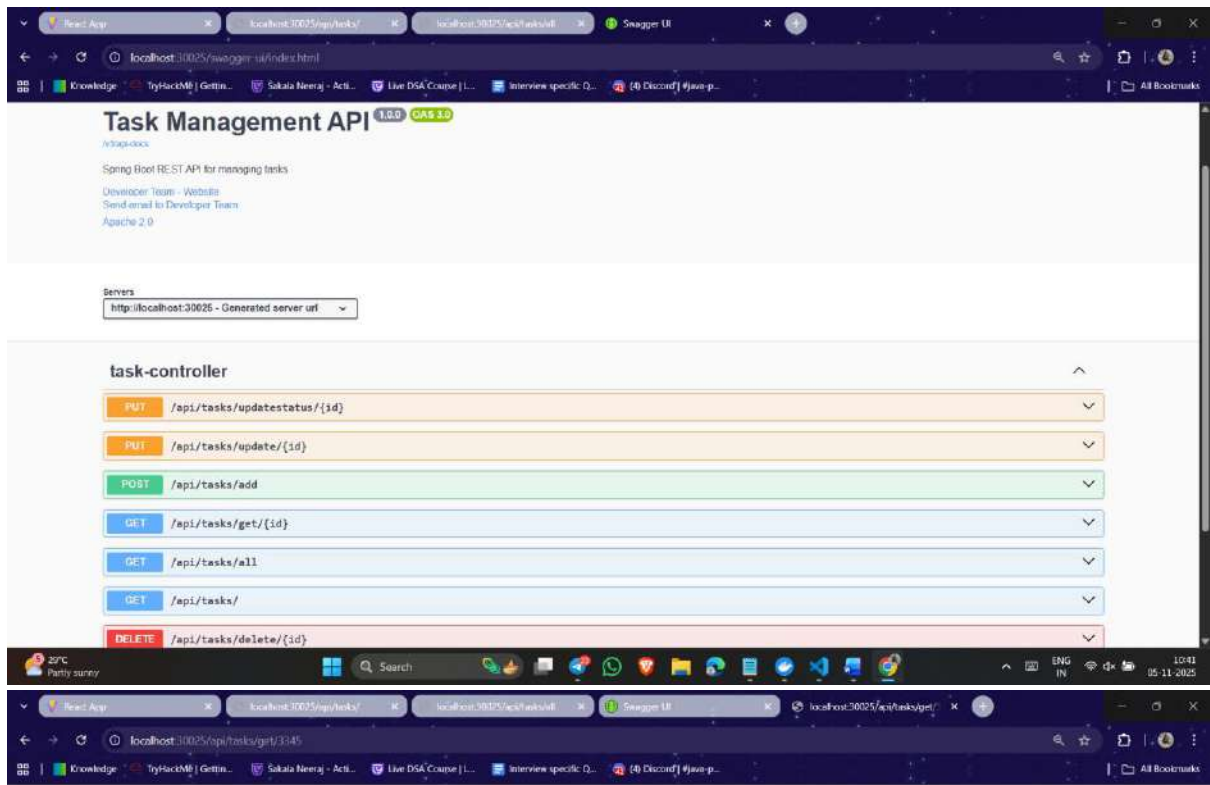
NAME	READY	STATUS	RESTARTS	AGE
backend-deployment-69d98c7c7b-6ddfk	1/1	Running	0	23m
backend-deployment-69d98c7c7b-qkxhz	1/1	Running	0	2m6s
backend-deployment-69d98c7c7b-sfvzg	1/1	Running	0	23m
backend-deployment-69d98c7c7b-shjpb	1/1	Running	0	2m6s
backend-deployment-69d98c7c7b-v5zcz	1/1	Running	0	2m6s
frontend-deployment-5587966678-4lqnh	1/1	Running	0	23m
frontend-deployment-5587966678-fxp66	1/1	Running	0	107s
frontend-deployment-5587966678-hxtd7	1/1	Running	0	107s
frontend-deployment-5587966678-hnbjv	1/1	Running	0	23m
frontend-deployment-5587966678-zvf82	1/1	Running	0	107s
mysql-deployment-78c4d56697-w269k	1/1	Running	0	23m

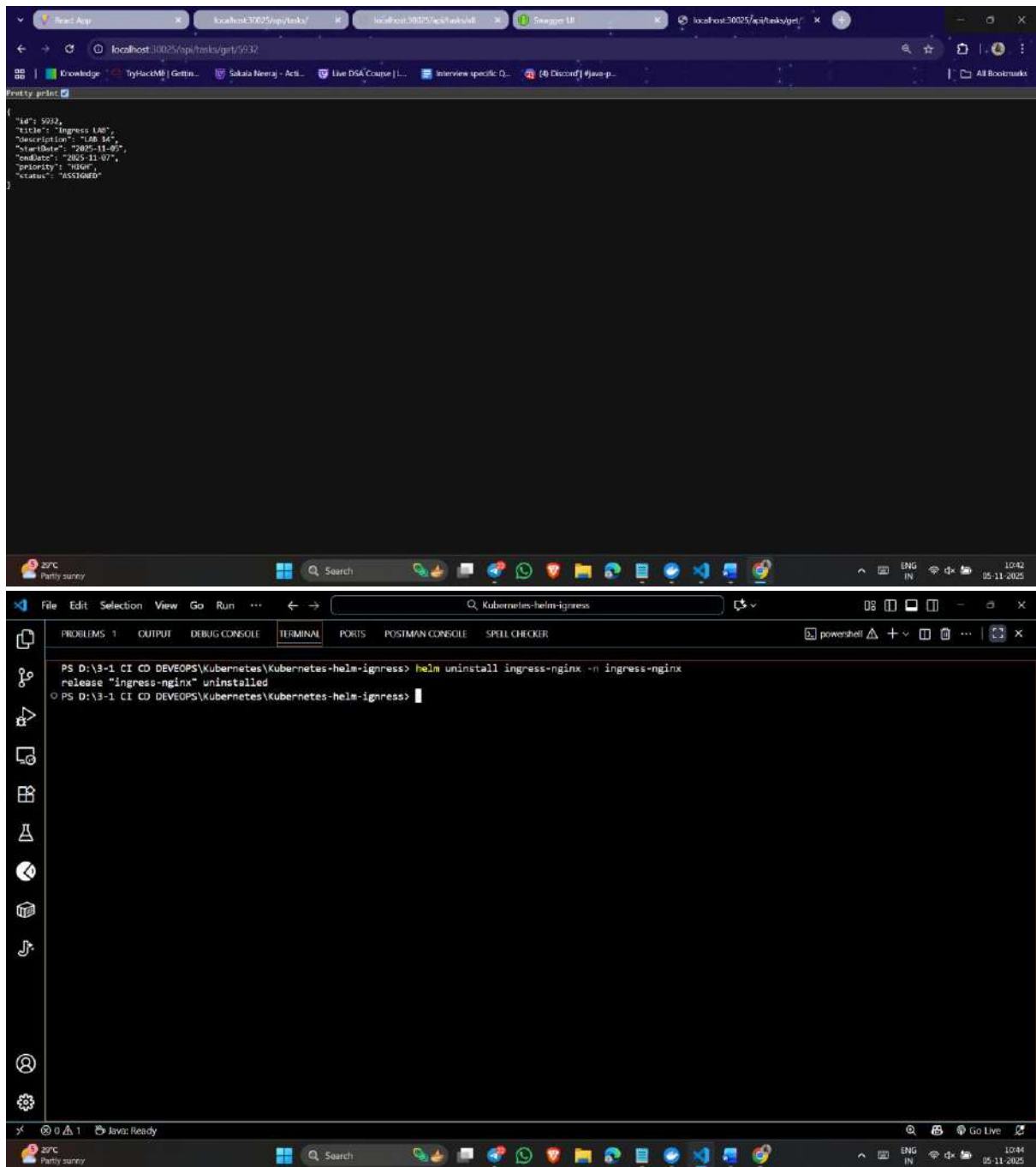
```
PS D:\3-1 CI CD DEVOPS\Kubernetes\Kubernetes-helm-ingress>
```

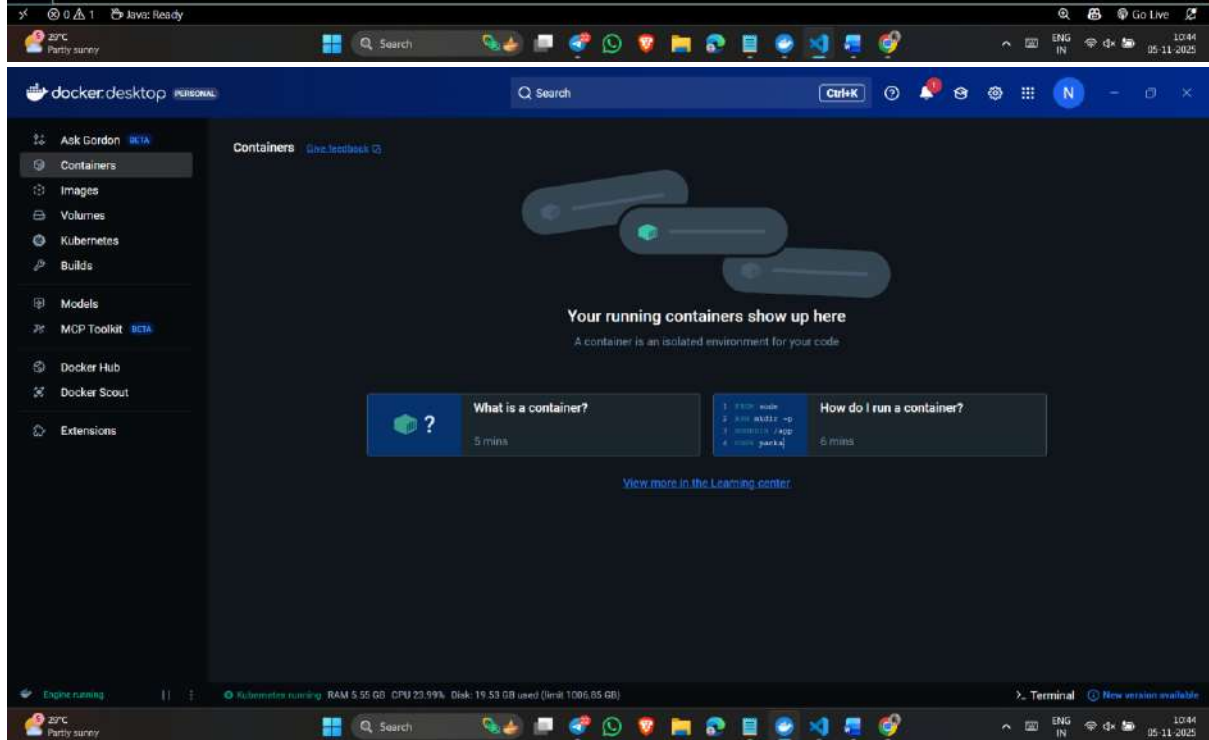
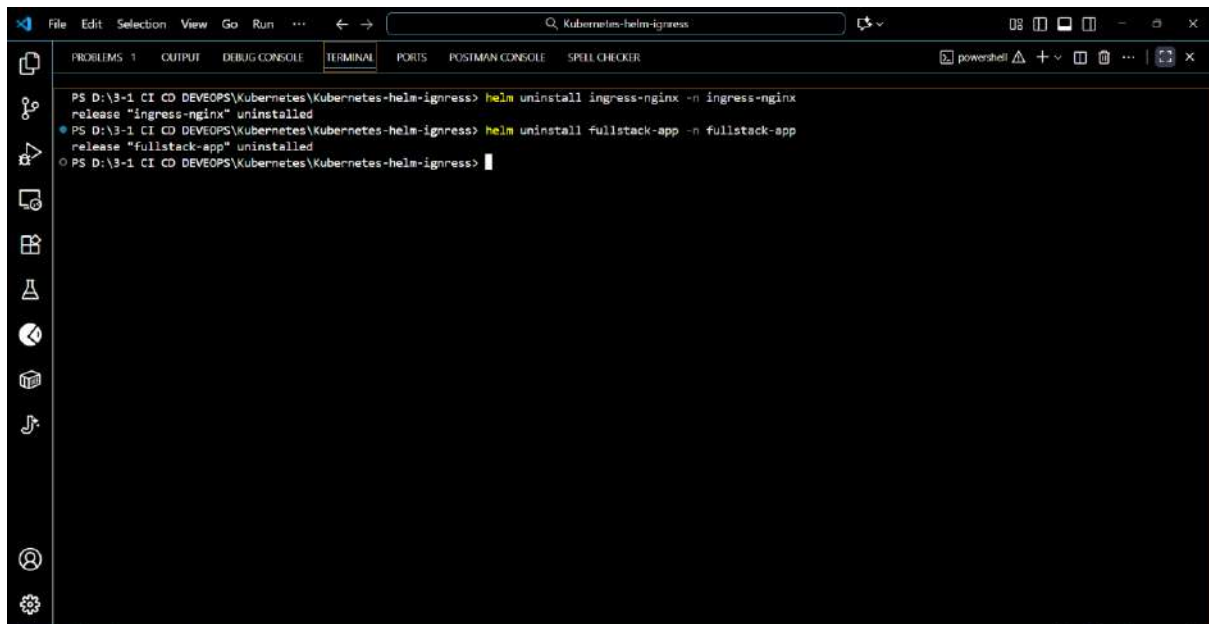


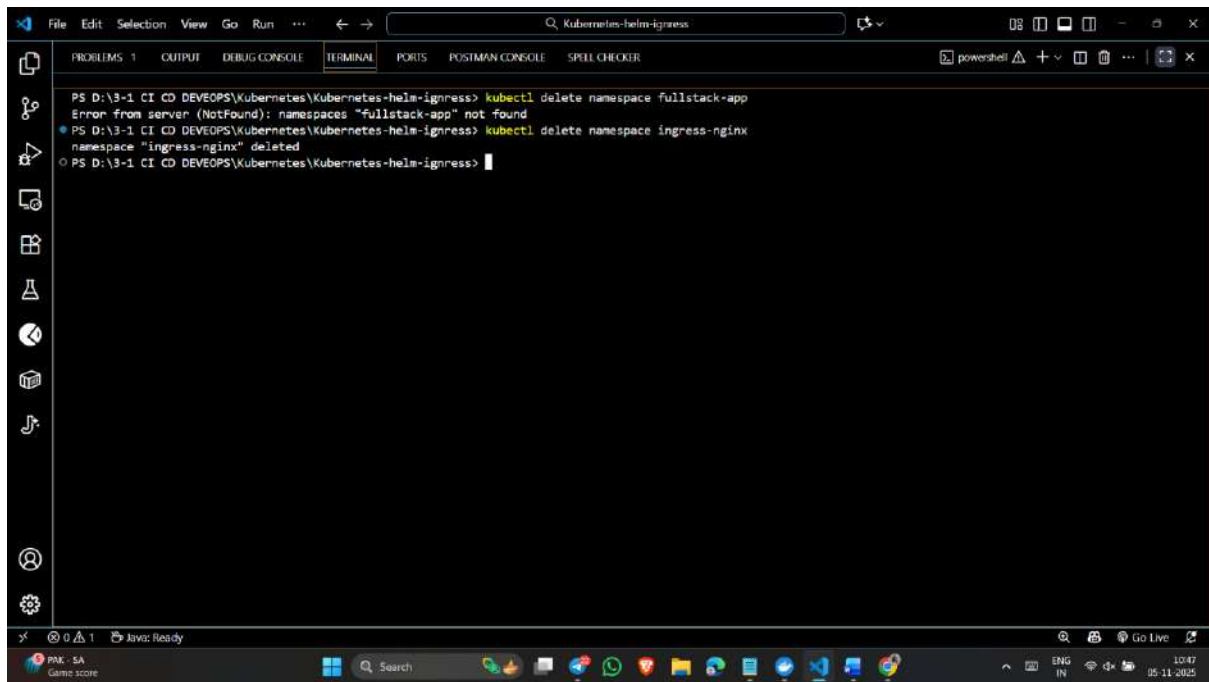










A screenshot of a Visual Studio Code terminal window. The terminal is running PowerShell and shows the following commands and output:

```
PS D:\3-1 CI CD\DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl delete namespace fullstack-app
Error from server (NotFound): namespaces "fullstack-app" not found
PS D:\3-1 CI CD\DEVEOPS\Kubernetes\Kubernetes-helm-ingress> kubectl delete namespace ingress-nginx
namespace "ingress-nginx" deleted
PS D:\3-1 CI CD\DEVEOPS\Kubernetes\Kubernetes-helm-ingress>
```

The terminal window has tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, PORTS, POSTMAN CONSOLE, and SPELL CHECKER. The TERMINAL tab is active. The VS Code interface includes a sidebar on the left with icons for Explorer, Search, Run and Debug, and Extensions. The bottom status bar shows 'PAK: SA Game score' and 'Java: Ready'.

 **Step 1: helm create fullstack-app [This command for one time only]**

This will generate a folder named fullstack-app/ with the following structure:

fullstack-app/

├─ **charts/**

├─ **templates/**

├─ **Chart.yaml**

├─ **values.yaml**

You can then modify values.yaml and templates as per your fullstack app (frontend, backend, MySQL, etc.).

 **Step 2: Add and Update Helm Repositories [These commands for first time only]**

```
helm repo add ingress-nginx https://kubernetes.github.io/ingress-nginx
```

```
helm repo update
```

```
helm repo list
```

Step 3: Install NGINX Ingress Controller

First time (creates namespace)

```
helm install ingress-nginx ingress-nginx/ingress-nginx --create-namespace --  
namespace ingress-nginx
```

Next time (upgrade without creating namespace)

```
helm upgrade ingress-nginx ingress-nginx/ingress-nginx --namespace ingress-  
nginx
```

Check Ingress Controller Pods

```
kubectl get pods -n ingress-nginx
```

View Ingress Logs

```
kubectl logs -f <ingress-pod-name> -n ingress-nginx
```

Step 4: Install or Upgrade Your Fullstack App

First time (creates namespace)

```
helm install fullstack-app ./fullstack-app --create-namespace --namespace  
fullstack-app
```

Next time (upgrade without recreating namespace)

```
helm upgrade fullstack-app ./fullstack-app --namespace fullstack-app
```

Check Application Pods

```
kubectl get pods -n fullstack-app
```

View Application Logs

```
kubectl logs -f <backend-pod-name> -n fullstack-app [this one important]
```

```
kubectl logs -f <frontend-pod-name> -n fullstack-app
```

```
kubectl logs -f <mysql-pod-name> -n fullstack-app
```

Step 5: List Helm Releases

```
helm list -n fullstack-app
```

```
-----  
-----
```

Step 6: List the services (svc) in the namespace (fullstack-app)

```
kubectl get svc -n fullstack-app
```

```
-----  
-----
```

Step 7: Check Release Status

```
helm status fullstack-app -n fullstack-app
```

```
-----  
-----
```

Step 8: View Manifest

```
helm get manifest fullstack-app -n fullstack-app
```

Step 9: Check Release History

```
helm history fullstack-app -n fullstack-app
```

Step 10: Horizontal Pod Autoscaler (HPA)

Check All HPAs

```
kubectl get hpa -n fullstack-app
```

Describe a Specific HPA

```
kubectl describe hpa backend -n fullstack-app
```

```
kubectl describe hpa frontend -n fullstack-app
```

Watch Scaling in Real Time

```
kubectl get hpa -n fullstack-app -w
```

Check Current Pods and Resource Usage


```
kubectl get pods -n fullstack-app
```

Manually Scale (Optional)

```
kubectl scale deployment backend-deployment --replicas=5 -n fullstack-app
```

```
kubectl scale deployment frontend-deployment --replicas=5 -n fullstack-app
```

Monitor Logs During Scaling

```
kubectl logs -f <backend-pod-name> -n fullstack-app
```


Step 11: Monitor Pods and Scaling Activity

```
kubectl get pods -n fullstack-app -w
```


Step 12: Uninstall the Fullstack App

```
helm uninstall fullstack-app -n fullstack-app
```

Step 13: Uninstall NGINX Ingress Controller

```
helm uninstall ingress-nginx -n ingress-nginx
```

Step 14: Delete Namespaces (Cleanup)

```
kubectl delete namespace fullstack-app
```

```
kubectl delete namespace ingress-nginx
```
