```
Welcome to Cloud Shell! Type "help" to get started.
Your Cloud Platform project in this session is set to rising-memory-452216-k0.
Use `gcloud config set project [PROJECT_ID]` to change to a different project.
leire_hernang@cloudshell:~ (rising-memory-452216-k0)$ gcloud services enable container.google
apis.com artifactregistry.googleapis.com
Operation "operations/acat.p2-519364648090-d49c251e-737f-4c96-a3f0-c0e68eddf9a5" finished suc
cessfully.
leire_hernang@cloudshell:~ (rising-memory-452216-k0)$
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ gcloud config set project my-proyecto-psp
Updated property [core/project].
leire_hernang@cloudshell:~ (my-proyecto-psp)$
```

```
    --zone=us-central1-a
Note: The Kubelet readonly port (10255) is now deprecated. Please update your workloads to us
e the recommended alternatives. See https://cloud.google.com/kubernetes-engine/docs/how-to/di
sable-kubelet-readonly-port for ways to check usage and for migration instructions.
Note: Your Pod address range (`--cluster-ipv4-cidr`) can accommodate at most 1008 node(s).
Creating cluster multi-service-cluster in us-central1-a... Cluster is being configured...wor
king..
Creating cluster multi-service-cluster in us-central1-a... Cluster is being health-checked..
.working.
Creating cluster multi-service-cluster in us-central1-a... Cluster is being health-checked (
Kubernetes Control Plane is healthy)...done.
Created [https://container.googleapis.com/v1/projects/my-proyecto-psp/zones/us-central1-a/clu
sters/multi-service-cluster].
To inspect the contents of your cluster, go to: https://console.cloud.google.com/kubernetes/w
orkload_/gcloud/us-central1-a/multi-service-cluster?project=my-proyecto-psp
kubeconfig entry generated for multi-service-cluster.
NAME: multi-service-cluster
LOCATION: us-central1-a
MASTER_VERSION: 1.31.5-gke.1068000
MASTER_IP: 35.193.72.98
MACHINE_TYPE: e2-medium
NODE_VERSION: 1.31.5-gke.1068000
NUM_NODES: 2
STATUS: RUNNING
leire_hernang@cloudshell:~ (my-proyecto-psp)$
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ gcloud container clusters get-credentials multi
-service-cluster --zone=us-central1-a
Fetching cluster endpoint and auth data.
kubeconfig entry generated for multi-service-cluster.
```

```
Microsoft Windows [Version 10.0.26100.3194]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\leire>mkdir multi-service-app && cd multi-service-app

C:\Users\leire\multi-service-app>mkdir backend && cd backend

C:\Users\leire\multi-service-app\backend>notepad app.py

C:\Users\leire\multi-service-app\backend>notepad requirements.txt

C:\Users\leire\multi-service-app\backend>nano Dockerfile
"nano" no se reconoce como un comando interno o externo,
programa o archivo por lotes ejecutable.

C:\Users\leire\multi-service-app\backend>
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ gcloud auth configure-docker
WARNING: Your config file at [/home/leire_hernang/.docker/config.json] contains these credential helper entries:

{
  "credHelpers": {
    "gcr.io": "gcloud",
    "us.gcr.io": "gcloud",
    "eu.gcr.io": "gcloud",
    "asia.gcr.io": "gcloud",
    "staging-k8s.gcr.io": "gcloud",
    "marketplace.gcr.io": "gcloud",
    "africa-south1-docker.pkg.dev": "gcloud",
    "asia-docker.pkg.dev": "gcloud",
    "asia-east1-docker.pkg.dev": "gcloud",
    "asia-east2-docker.pkg.dev": "gcloud",
    "asia-northeast1-docker.pkg.dev": "gcloud",
    "asia-northeast2-docker.pkg.dev": "gcloud",
    "asia-northeast3-docker.pkg.dev": "gcloud",
    "asia-south1-docker.pkg.dev": "gcloud",
    "asia-south2-docker.pkg.dev": "gcloud",
    "asia-southeast1-docker.pkg.dev": "gcloud",
    "asia-southeast2-docker.pkg.dev": "gcloud",
Adding credentials for all GCR repositories.
WARNING: A long list of credential helpers may cause delays running 'docker build'. We recommend passing the registry name to configure only the registry you are using.
gcloud credential helpers already registered correctly.
leire_hernang@cloudshell:~ (my-proyecto-psp)$ docker build -t gcr.io/[TU_PROYECTO]/backend:v1 .
2025/02/27 17:27:26 in: []string{}
2025/02/27 17:27:26 Parsed entitlements: []
[+] Building 0.0s (0/0)                                                    docker:default
ERROR: invalid tag "gcr.io/[TU_PROYECTO]/backend:v1": invalid reference format
exit status 1
leire_hernang@cloudshell:~ (my-proyecto-psp)$
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ gcloud config get-value project
Your active configuration is: [cloudshell-14376]
my-proyecto-psp
leire_hernang@cloudshell:~ (my-proyecto-psp)$
```

```
  GNU nano 7.2                          backend-deployment.yaml *
apiVersion: apps/v1
kind: Deployment
metadata:
  name: backend
spec:
  replicas: 2
  selector:
    matchLabels:
      app: backend
  template:
    metadata:
      labels:
        app: backend
    spec:
      containers:
      - name: backend
        image: gcr.io/[TU_PROYECTO]/backend:v1
        ports:
        - containerPort: 8000

^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line
```

```
  GNU nano 7.2                          backend-service.yaml *
apiVersion: v1
kind: Service
metadata:
  name: backend-service
spec:
  selector:
    app: backend
  ports:
  - protocol: TCP
    port: 8000
    targetPort: 8000
  type: ClusterIP
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ kubectl apply -f backend-deployment.yaml
kubectl apply -f backend-service.yaml
deployment.apps/backend created
service/backend-service created
leire_hernang@cloudshell:~ (my-proyecto-psp)$
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ kubectl get pods
NAME                       READY   STATUS             RESTARTS   AGE
backend-7f7655949d-7bmpd   0/1     InvalidImageName   0          23s
backend-7f7655949d-xmfj2   0/1     InvalidImageName   0          23s
leire_hernang@cloudshell:~ (my-proyecto-psp)$
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ kubectl get services
NAME              TYPE        CLUSTER-IP      EXTERNAL-IP   PORT(S)    AGE
backend-service   ClusterIP   34.118.237.31   <none>        8000/TCP   42s
kubernetes        ClusterIP   34.118.224.1    <none>        443/TCP    14m
```

```
leire_hernang@cloudshell:~ (my-proyecto-psp)$ mkdir frontend && cd frontend
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ nano server.js
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ nano package.json
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ nano Dockerfile
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$
```

```
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ docker build -t gcr.io/my-proyecto-psp
/frontend:v1 .
2025/02/27 17:33:45 in: []string{}
2025/02/27 17:33:45 Parsed entitlements: []
[+] Building 8.0s (4/9)                                                    docker:default
 => [internal] load metadata for docker.io/library/node:14                          1.4s
 => [internal] load .dockerignore                                                   0.0s
 => => transferring context: 2B                                                     0.0s
 => [1/5] FROM docker.io/library/node:14@sha256:a158d3b9b4e3fa813fa6c8c590b8f0a860e015  6.6s
 => => resolve docker.io/library/node:14@sha256:a158d3b9b4e3fa813fa6c8c590b8f0a860e015  0.0s
 => => sha256:2ff1d7c41c74a25258bfa6f0b8adb0a727f84518f55f65ca845ebc 50.45MB / 50.45MB  1.1s
 => => sha256:b253aeafeaa7e0671bb60008df01de101a38a045ff7bc656e3b0fbfc 7.86MB / 7.86MB  0.2s
 => => sha256:3d2201bd995cccf12851a50820de03d34a17011dcbb9ac9fdf3a50 10.00MB / 10.00MB  0.3s
 => => sha256:a158d3b9b4e3fa813fa6c8c590b8f0a860e015ad4e59bbce5744d2f6fd84 776B / 776B  0.0s
 => => sha256:2cafa3fbb0b6529ee4726b4f599ec27ee557ea3dea7019182323b377 2.21kB / 2.21kB  0.0s
 => => sha256:1d12470fa662a2a5cb50378dcdc8ea228c1735747db410bbefb8e2d9 7.51kB / 7.51kB  0.0s
 => => sha256:1de76e268b103d05fa8960e0f77951ff54b912b63429c34f5d6adf 51.88MB / 51.88MB  1.1s
 => => sha256:d9a8df5894511ce28a05e2925a75e8a4acbd0634c39ad734fdfb 191.85MB / 191.85MB  2.7s
```

```
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ docker push gcr.io/my-proyecto-psp/fro
ntend:v1
The push refers to repository [gcr.io/my-proyecto-psp/frontend]
2ff912c6a8f7: Preparing
68a13161fa78: Preparing
a32c2776d1f3: Preparing
da4413722189: Preparing
0d5f5a015e5d: Preparing
3c777d951de2: Waiting
f8a91dd5fc84: Waiting
cb81227abde5: Waiting
e01a454893a9: Waiting
c45660adde37: Waiting
fe0fb3ab4a0f: Waiting
f1186e5061f2: Waiting
b2dba7477754: Waiting
```

```
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ nano frontend-deployment.yaml
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ nano frontend-service.yaml
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$
```

```
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ kubectl apply -f frontend-deployment.y
aml
kubectl apply -f frontend-service.yaml

deployment.apps/frontend created
service/frontend-service created
```

```
leire_hernang@cloudshell:~/frontend (my-proyecto-psp)$ kubectl get services frontend-service
NAME               TYPE           CLUSTER-IP       EXTERNAL-IP     PORT(S)        AGE
frontend-service   LoadBalancer   34.118.238.189   34.55.11.218    80:32611/TCP   2m49s
```

```
  GNU nano 7.2                                  app.py *
from fastapi import FastAPI

app = FastAPI()

@app.get("/")
def read_root():
    return {"message": "Hello from FastAPI v2"}

@app.get("/status")
def read_status():
    return {"status": "running"}
```

```
leire_hernang@cloudshell:~/backend (my-proyecto-psp)$ docker build -t gcr.io/my-proyecto-psp/
backend:v2 .
2025/02/27 17:50:53 in: []string{}
2025/02/27 17:50:53 Parsed entitlements: []
[+] Building 0.8s (10/10) FINISHED                                              docker:default
 => [internal] load build definition from Dockerfile                                      0.0s
 => => transferring dockerfile: 203B                                                      0.0s
 => [internal] load metadata for docker.io/library/python:3.9                             0.3s
 => [internal] load .dockerignore                                                         0.0s
 => => transferring context: 2B                                                           0.0s
 => [1/5] FROM docker.io/library/python:3.9@sha256:5ea663a1c6ba266fdcac5949d1d2ea364ce    0.0s
 => [internal] load build context                                                         0.0s
 => => transferring context: 302B                                                         0.0s
 => CACHED [2/5] WORKDIR /app                                                             0.0s
 => CACHED [3/5] COPY requirements.txt .                                                  0.0s
 => CACHED [4/5] RUN pip install -r requirements.txt                                      0.0s
 => [5/5] COPY . .                                                                        0.3s
 => exporting to image                                                                    0.0s
 => => exporting layers                                                                   0.0s
 => => writing image sha256:ee083071349f59cf781f2c7f9d4f61e8cbe104c607903cc91f6d5ec1a8     0.0s
 => => naming to gcr.io/my-proyecto-psp/backend:v2                                        0.0s
```

```
leire_hernang@cloudshell:~/backend (my-proyecto-psp)$ docker push gcr.io/my-proyecto-psp/back
end:v2
The push refers to repository [gcr.io/my-proyecto-psp/backend]
15d14afe6b5c: Pushed
6087652b1106: Pushed
e1092a91a170: Pushed
4e68cee4e399: Pushed
01db3e67097a: Layer already exists
e49d0c94aa2a: Layer already exists
1c86760c5c93: Layer already exists
4b017a36fd9c: Layer already exists
20a9b386e10e: Layer already exists
f8217d7865d2: Layer already exists
```

```
leire_hernang@cloudshell:~/backend (my-proyecto-psp)$ kubectl get pods
NAME                        READY   STATUS             RESTARTS   AGE
backend-785d965f8b-cz4lk    1/1     Running            0          45s
backend-785d965f8b-j4mpf    1/1     Running            0          66s
frontend-76d4777665-78vhq   0/1     InvalidImageName   0          15m
frontend-76d4777665-w2j5h   0/1     InvalidImageName   0          15m
```