Kubernetes Installation

Install Minikube

```
[aratrika@Aratrikas-MacBook-Air ~ % curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-darwin-arm64
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100 87.5M  100 87.5M    0     0  45.5M      0  0:00:01  0:00:01 --:--:-- 45.6M
[aratrika@Aratrikas-MacBook-Air ~ % sudo install minikube-darwin-arm64 /usr/local/bin/minikube
[Password:
```

Start Minikube

```
[aratrika@Aratrikas-MacBook-Air ~ % minikube start

😄  minikube v1.32.0 on Darwin 14.1.1 (arm64)
✨  Automatically selected the docker driver
📌  Using Docker Desktop driver with root privileges
👍  Starting control plane node minikube in cluster minikube
🚜  Pulling base image ...
💾  Downloading Kubernetes v1.28.3 preload ...
    > preloaded-images-k8s-v18-v1...:  341.16 MiB / 341.16 MiB  100.00% 18.62 M
    > gcr.io/k8s-minikube/kicbase...:  410.58 MiB / 410.58 MiB  100.00% 20.76 M
🔥  Creating docker container (CPUs=2, Memory=4000MB) ...
🐳  Preparing Kubernetes v1.28.3 on Docker 24.0.7 ...
    ▪ Generating certificates and keys ...
    ▪ Booting up control plane ...
    ▪ Configuring RBAC rules ...
🔗  Configuring bridge CNI (Container Networking Interface) ...
🔎  Verifying Kubernetes components...
    ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
🌟  Enabled addons: storage-provisioner, default-storageclass
🏄  Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

Install kubectl

```
[aratrika@Aratrikas-MacBook-Air ~ % brew install kubectl
==> Downloading https://ghcr.io/v2/homebrew/core/kubernetes-cli/manifests/1.29.0
######################################################################################################################################## 100.0%
==> Fetching kubernetes-cli
==> Downloading https://ghcr.io/v2/homebrew/core/kubernetes-cli/blobs/sha256:342175c8b97a09220054b936e0b06bcba56871d8291f90c9e4564bdabad72104
######################################################################################################################################## 100.0%
==> Pouring kubernetes-cli--1.29.0.arm64_sonoma.bottle.tar.gz
==> Caveats
zsh completions have been installed to:
  /opt/homebrew/share/zsh/site-functions
==> Summary
🍺  /opt/homebrew/Cellar/kubernetes-cli/1.29.0: 234 files, 59.2MB
==> Running `brew cleanup kubernetes-cli`...
Disable this behaviour by setting HOMEBREW_NO_INSTALL_CLEANUP.
Hide these hints with HOMEBREW_NO_ENV_HINTS (see `man brew`).
==> `brew cleanup` has not been run in the last 30 days, running now...
Disable this behaviour by setting HOMEBREW_NO_INSTALL_CLEANUP.
Hide these hints with HOMEBREW_NO_ENV_HINTS (see `man brew`).
Removing: /Users/aratrika/Library/Caches/Homebrew/c-ares--1.21.0... (171.1KB)
Removing: /Users/aratrika/Library/Caches/Homebrew/c-ares--1.22.1... (203.7KB)
Removing: /Users/aratrika/Library/Caches/Homebrew/ca-certificates--2023-08-22... (125.2KB)
Removing: /Users/aratrika/Library/Caches/Homebrew/cocoapods--1.14.2... (9.6MB)
Removing: /opt/homebrew/Cellar/edencommon/2023.11.06.00... (19 files, 420.2KB)
Removing: /Users/aratrika/Library/Caches/Homebrew/edencommon--2023.11.06.00... (64.9KB)
Removing: /opt/homebrew/Cellar/fb303/2023.11.06.00... (57 files, 5.6MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/fb303--2023.11.06.00... (1.1MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/fbthrift--2023.11.06.00... (7.2MB)
Removing: /opt/homebrew/Cellar/fizz/2023.11.06.00... (206 files, 4MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/fizz--2023.11.06.00... (1023.6KB)
Removing: /Users/aratrika/Library/Caches/Homebrew/fmt--10.1.1... (310.7KB)
Removing: /opt/homebrew/Cellar/folly/2023.11.06.00... (882 files, 25.7MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/folly--2023.11.06.00... (6.0MB)
Removing: /Users/Aratrikas/Library/Caches/Homebrew/mongodb-database-tools--100.9.1.zip... (58.4MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/mongosh--2.1.0... (11.3MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/node--21.2.0... (15.3MB)
Removing: /opt/homebrew/Cellar/openssl@3/3.1.4... (6,496 files, 28.4MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/openssl@3--3.1.4... (7.7MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/python@3.11--3.11.6_1... (14.9MB)
Removing: /opt/homebrew/Cellar/readline/8.2.1... (50 files, 1.7MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/ruby--3.2.2_1... (12.9MB)
Removing: /opt/homebrew/Cellar/sqlite/3.44.0... (11 files, 4.7MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/sqlite--3.44.0... (2.2MB)
Removing: /opt/homebrew/Cellar/wangle/2023.11.06.00... (118 files, 3.5MB)
Removing: /Users/aratrika/Library/Caches/Homebrew/wangle--2023.11.06.00... (852KB)
Removing: /Users/aratrika/Library/Logs/Homebrew/mongodb-community... (126B)
Removing: /Users/aratrika/Library/Logs/Homebrew/mongodb-database-tools... (131B)
Removing: /Users/aratrika/Library/Logs/Homebrew/postgresql@15... (1.3KB)
Removing: /Users/aratrika/Library/Logs/Homebrew/openssl@3... (64B)
Removing: /Users/aratrika/Library/Logs/Homebrew/watchman... (64B)
Removing: /Users/aratrika/Library/Logs/Homebrew/node... (64B)
Pruned 0 symbolic links and 2 directories from /opt/homebrew
```

Configure kubectl to use Minikube & Verify installation

```
[aratrika@Aratrikas-MacBook-Air ~ % kubectl config use-context minikube

Switched to context "minikube".
aratrika@Aratrikas-MacBook-Air ~ % kubectl get nodes

NAME       STATUS   ROLES           AGE       VERSION
minikube   Ready    control-plane   2m51s     v1.28.3
[aratrika@Aratrikas-MacBook-Air ~ % kubectl get pods --all-namespaces

NAMESPACE     NAME                                READY   STATUS    RESTARTS       AGE
kube-system   coredns-5dd5756b68-7nt9g            1/1     Running   0              3m57s
kube-system   etcd-minikube                       1/1     Running   0              4m10s
kube-system   kube-apiserver-minikube             1/1     Running   0              4m10s
kube-system   kube-controller-manager-minikube    1/1     Running   0              4m10s
kube-system   kube-proxy-8k9gm                     1/1     Running   0              3m57s
kube-system   kube-scheduler-minikube             1/1     Running   0              4m10s
kube-system   storage-provisioner                 1/1     Running   1 (3m53s ago)  4m9s
```
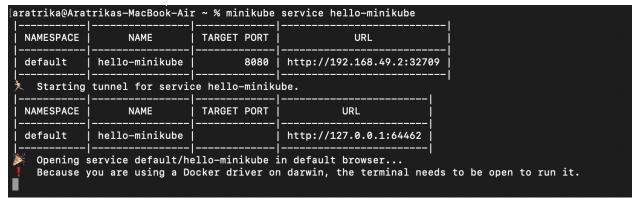
Deploy a sample application

```
[aratrika@Aratrikas-MacBook-Air ~ % kubectl create deployment hello-minikube --image=kicbase/echo-server:1.0
deployment.apps/hello-minikube created
```

Expose the deployment

```
[aratrika@Aratrikas-MacBook-Air ~ % kubectl expose deployment hello-minikube --type=NodePort --port=8080
service/hello-minikube exposed
```

Access the application

```
[aratrika@Aratrikas-MacBook-Air ~ % minikube service hello-minikube
|-----------|----------------|-------------|---------------------------|
| NAMESPACE |      NAME      | TARGET PORT |            URL            |
|-----------|----------------|-------------|---------------------------|
| default   | hello-minikube |        8080 | http://192.168.49.2:32709 |
|-----------|----------------|-------------|---------------------------|
🏃  Starting tunnel for service hello-minikube.
|-----------|----------------|-------------|------------------------|
| NAMESPACE |      NAME      | TARGET PORT |          URL           |
|-----------|----------------|-------------|------------------------|
| default   | hello-minikube |             | http://127.0.0.1:64462 |
|-----------|----------------|-------------|------------------------|
🎉  Opening service default/hello-minikube in default browser...
❗  Because you are using a Docker driver on darwin, the terminal needs to be open to run it.
```

```
Request served by hello-minikube-7f54cff968-q5hhd

HTTP/1.1 GET /

Host: 127.0.0.1:64462
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9
Connection: keep-alive
Cookie: voter_id=8599609a16fa89
Sec-Ch-Ua: "Not_A Brand";v="8", "Chromium";v="120", "Google Chrome";v="120"
Sec-Ch-Ua-Mobile: ?0
Sec-Ch-Ua-Platform: "macOS"
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: none
Sec-Fetch-User: ?1
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_15_7) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/120.0.0.0 Safari/537.36
```