Challenge 1

Symbiosis is a health product manufacturing company and currently on-premises infrastructure. They have recognized the benefits of moving to a cloud infrastructure & would like to evaluate an AWS cloud solution.
Based on their priorities and internal discussions, they have provided you with some high- level requirements which they would like you to implement in the proposed solution. The high-level requirements are as follows:

- A private isolated network which would best suit Symbiosis's 2 tier architecture needs. In order to meet their internal SLA's they require a highly available solution as well.
- Symbiosis being a B2C company, would typically like their web applications to be accessible over the internet and thus handle HTTP traffic.
- The database tier should have restricted access (not open to HTTP) and allow traffic only through the web tier.
- They would like to reduce the administrative burden of managing their SQL database and require a managed database for their SQL engine in the proposed solution. They need the database to be highly available.
- Currently they experience medium to high traffic on their network. The traffic to the web tier is managed by a load balancer which diverts traffic to healthy instances. They would ideally like a Load Balancer with an ability to perform layer 4 (Transport Protocol) and layer 7 (Application) checks while balancing the load. There is no requirement at this point to balance the load on the database tier.
- In their current setup, the traffic being inconsistent, requires over provisioning resulting in increased costs. In order to overcome this issue, they would like the new system to allow automatic scaling [horizontally] up in the event of a traffic spike and scale down once the number of requests have reduced

  Assignment deliverables

  1. An architecture diagram that would suit the needs of the above case study
  2. An implementation of the said architecture in any IaC framework (i.e terraform). You

  can choose any application to host in your implementation. A good example of a webapp that does CRUD operations can also be found here: https://github.com/chapagain/nodejs-mysql-crud.

  3. Create a CICD workflow to deploy the above application to production in an automated way. There are 3 environments - DEV, UAT, Production. Choose a tool of your choice.

  4. Create an API to expose data saved in the database via services of your choosing, making sure the APIs are secure.

  5. How would you monitor and what metrics would you use

[Optional] Challenge 2

Write the k8 YAML config required to deploy a basic Nginx webserver with this image nginxdemos/hello, using minikube to provision your cluster control plane. (Assuming this is a production deployment deploy whatever that is required)

Assignment deliverables

1. Deployment YAML for Nginx webserver
2. Minikube setup for demo