MOOC's design project

Introduction :

The objective of this work is to perform the MOOC website 's project design.
The purpose of this web application :
Users could visite to the website applicaiton via their own webserver and will be able to search for a list of available MOOCS.
They will be able to view the details of a course, see the comments attached to it left by other usuers and add their own.
To that purpose users will need to register and authenticate

In this projetc, we simply have 2 kind of priviledges attached to each user :
Lambda users will be able to add comments and rate courses. They use the web application to learn, which is supposed free in our case.
Super users will be able to promote users add, update and delete an existing course.

Methodology :

For this project, I will use the agile methodology and DevOps :
Git versionning and CI/CD : Github and Azure Devops to host the project and delever the pipiplines (build and release) for développement and production process.
Associate the infrastructure provisionning to its configuration in the same CI-CD pipeline to save time :
Terraform to provision the cloud infrastructure that will host the application.
Ansible, Docker and Kubernetes to deploy my code.
To sum up, I will not start coding before having set-up my cloud infrastructure and building my piplines. This will allow me to deliver continuously and version my code.

Application architecture :

This will be a restfull API, which will run on containers in the cloud.
A back-end will be performed in Python (Flask) in order to maintain my skills in this language learnt in the first 2 month of our training at Simpon.
For the front-end, I will use a framework, we have already started learning : React and use Typescript for more security.
The database will be a PostgresSQL ;
All the components will be hosted in containers within virtual machines in Azure.

UML Modeling of the Project :

- Use Case Diagram :

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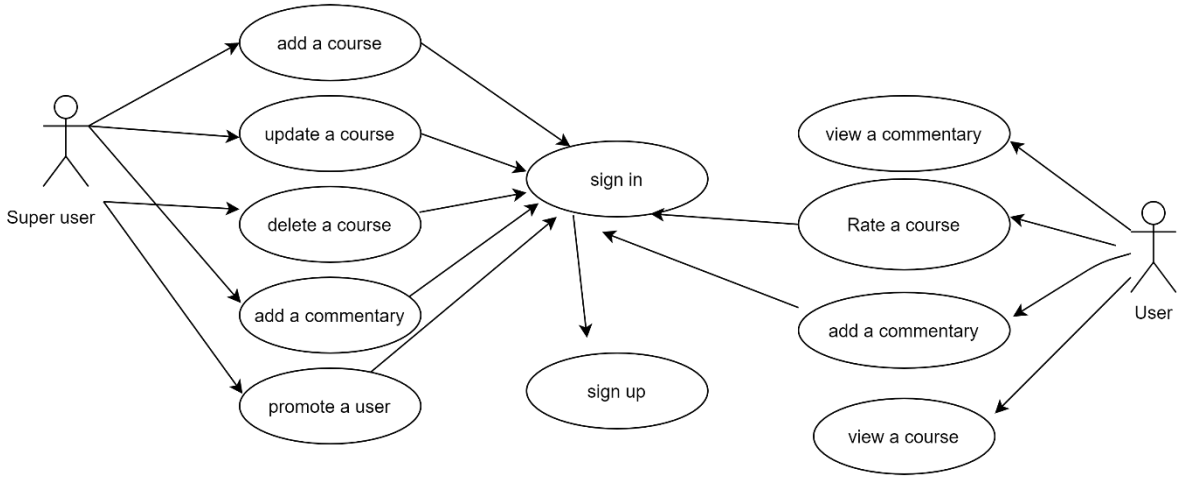
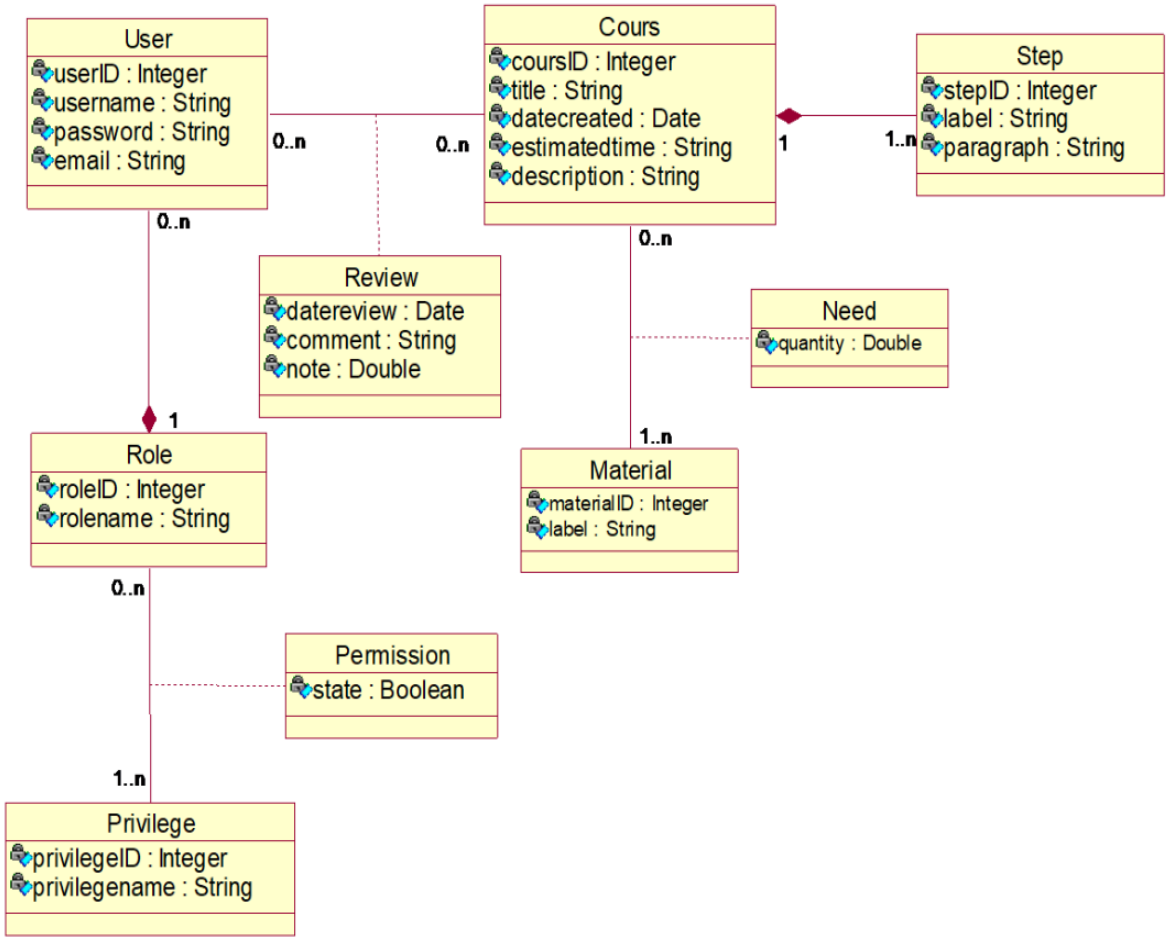
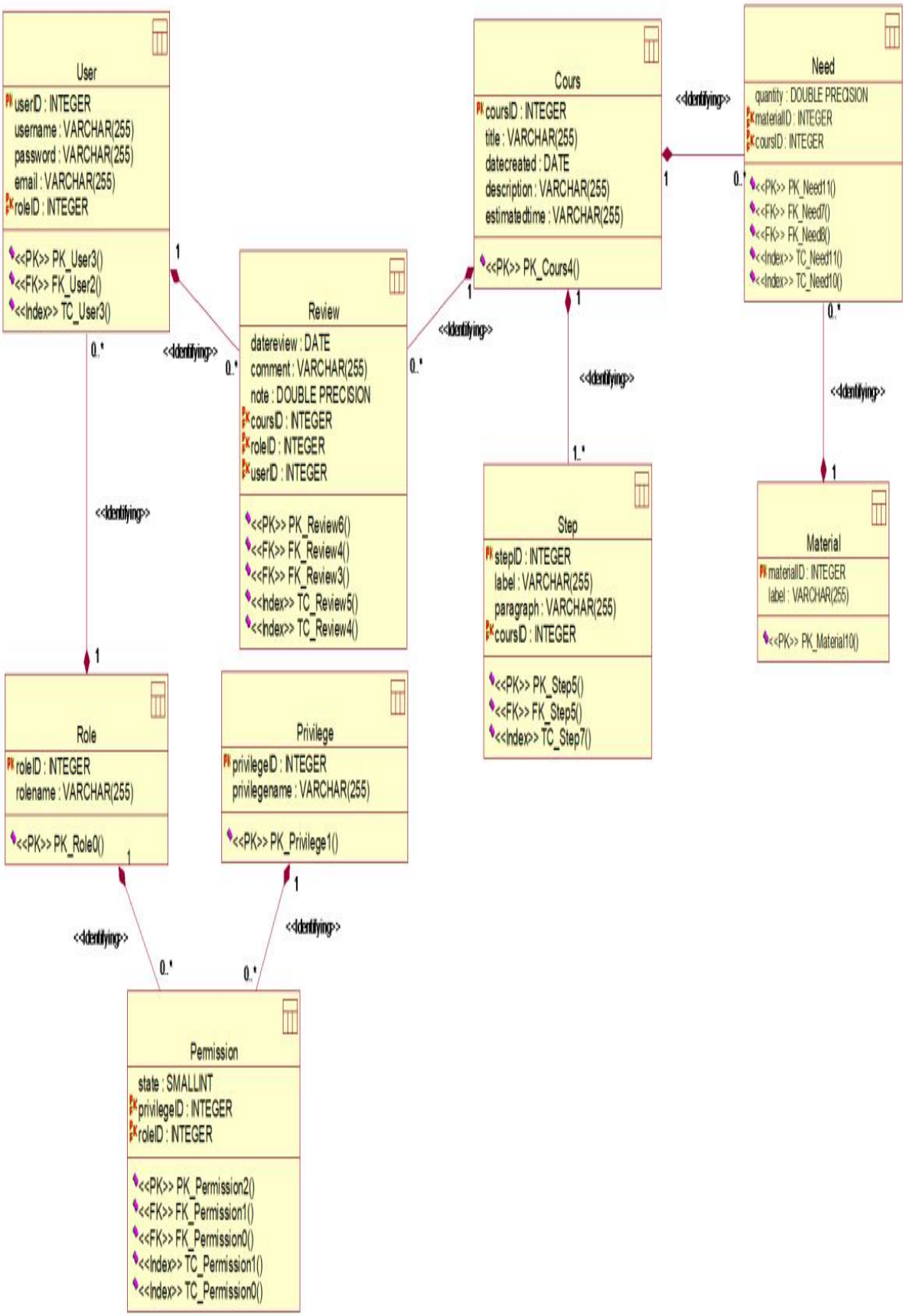


Class diagram :



Physical data model :



Activity Diagrams :

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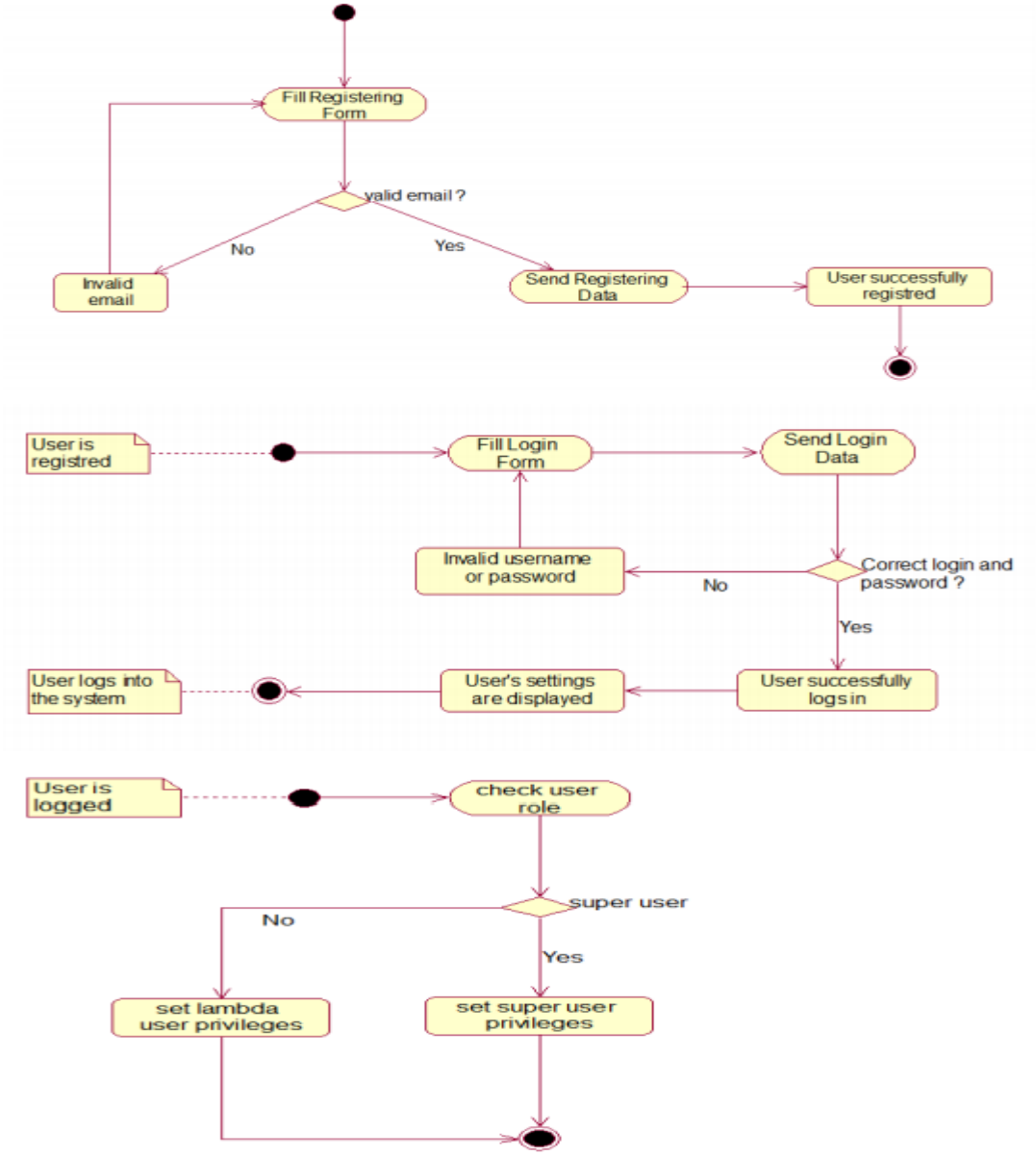

Cloud architecture :

I will use basic Virtual machines to host a Kubernetes cluster.
Depending on the choice of the distribution I will use, Rancher K3S or VMware K8S. I will install them using a custom script extension within a VM or use an existing role in Ansible.
As i have worked with ansible in my job (dynamic inventory) I will use the last solution, to configure all the VMs.
Ansible will allow me to run Postgres directly within a docker container.
My current job is to use ansible with terraform to provision VMs and to deploy in them applications so as to test azure functionalities such as monitor, log analytics, securiy center, policies and so on.
I will soon use containers and then Kubernetes, which allow me to join my work to this project.