Submission 2

Tech Report – DevOps

There are many different parts of the DevOps in our project, however not all of them are going to be useful to most people, so I'm only going to go over the main parts, the CI/CD pipeline, and the Virtual Machine.

CI/CD Pipeline

CI/CD stands for Continuous Integration/Continuous Deployment, and it basically allows the developers of a project to have checks to ensure that when a commit is made, it doesn't break the application, and that all working commits are immediately deployed so that the most recent working version is the one in deployment.

Our pipeline is all done through the `.gitlab-ci.yml` file, which goes over all the required steps for our app to be deployed and checks that the commit is working. This is done in 5 different stages: check, build, package, release, deploy.

Before any of these stages it first creates a docker image of jhipster:v7.9.4, which runs on top of an ubuntu docker image, in which all the stages are then run on.

Check

Check is the first stage in the pipeline, and it is also the shortest. All it does is runs a single command to check if the repository exists in the place it is meant to be in. It does this by running `./mvnw -ntp cheskstyle:check -Dmaven.repo.local=$MAVEN_USER_HOME`

Build

After it does its checks to see if the repository exists, it then enters the build stage of the pipeline. In the build stage, the source files are compiled using maven on our Ubuntu VM to prepare us for the next stage. It does this by running `./mvnw -ntp compile -P webapp -Dmaven.repo.local=$MAVEN_USER_HOME`

Package

After compiling our app, we need to prepare the VM for release. To do this we need to install chromium-browser, which is the basis of most modern browsers. To install chromium, we first need to run `sudo apt-get update`, which checks to see if any installed packages have any updates. Note that this doesn't update them, it just checks to see if they can be updated. If we tried to just run this, it would fail as you need to input the root password for `sudo`, which is impossible for us to do the normal way. To get around this, we pipe the password into the `sudo apt-get update` command and give it the `-S` flag so that sudo will read the password from the standard input (stdin) instead of from a terminal window. This gives us the final command of `echo "jhipster" | sudo -S apt-get update` where 'jhipster' is the root password.

After this, we then need to actually install chromium, which is done by running `sudo apt-get install chromium-browser`, however this encounters the same issues as update so we use the same method to get it to work, but with an added `-y` flag which simply says 'yes' to any prompts that occur in the installation process, since we wouldn't be able to do this manually. Finally, this gives us our final command of `echo "jhipster" | sudo -S apt-get install -y chromium-browser`.

On installation of chromium-browser, these additional packages also get installed.

```
apparmor dbus dbus-user-session dirmngr dmsetup fuse gir1.2-glib-2.0 gnupg
gnupg-l10n gnupg-utils gpg gpg-agent gpg-wks-client gpg-wks-server gpgconf
gpgsm libapparmor1 libargon2-1 libassuan0 libbsd0 libcap2 libcbor0.6
libcryptsetup12 libdbus-1-3 libdevmapper1.02.1 libedit2 libfido2-1 libfuse2
libgirepository-1.0-1 libglib2.0-0 libglib2.0-data libicu66 libip4tc2
libjson-c4 libkmod2 libksba8 liblzo2-2 libnpth0 libnss-systemd
libpam-systemd libpython3-stdlib libpython3.8 libpython3.8-minimal
libpython3.8-stdlib libsystemd0 libudev1 libx11-6 libx11-data libxau6
libxcb1 libxdmcp6 libxext6 libxml2 libxmuu1 networkd-dispatcher
openssh-client pinentry-curses python3 python3-dbus python3-gi
python3-minimal python3.8 python3.8-minimal shared-mime-info snapd
squashfs-tools systemd systemd-sysv systemd-timesyncd udev xauth
xdg-user-dirs
```

After this, we verify the results of the integrity tests to ensure that the quality criteria is met. This is done by running `./mvnw -ntp verify -Pprod -DskipTests -Dmaven.repo.local =$MAVEN_USER_HOME`

Release

The release stage only has one command, but it does a lot, which is building the docker image, so it is ready for release and deployment. It does this by first installing all prerequisites for the project, then it reads through the dockerfile to add the rest of the required dependencies.

Deploy

The deploy stage of the pipeline has 2 different branches, one for development and one for production. The pipeline defaults to dev and only pushes to prod when it is a tagged commit on the main branch. To do a tagged commit, run `epolgit tag -a <version> -m <message>` (example: `git tag -a v0.1.1 -m “version 0.1.1”` before you commit and run `git push -u origin main`.

deploy-prod

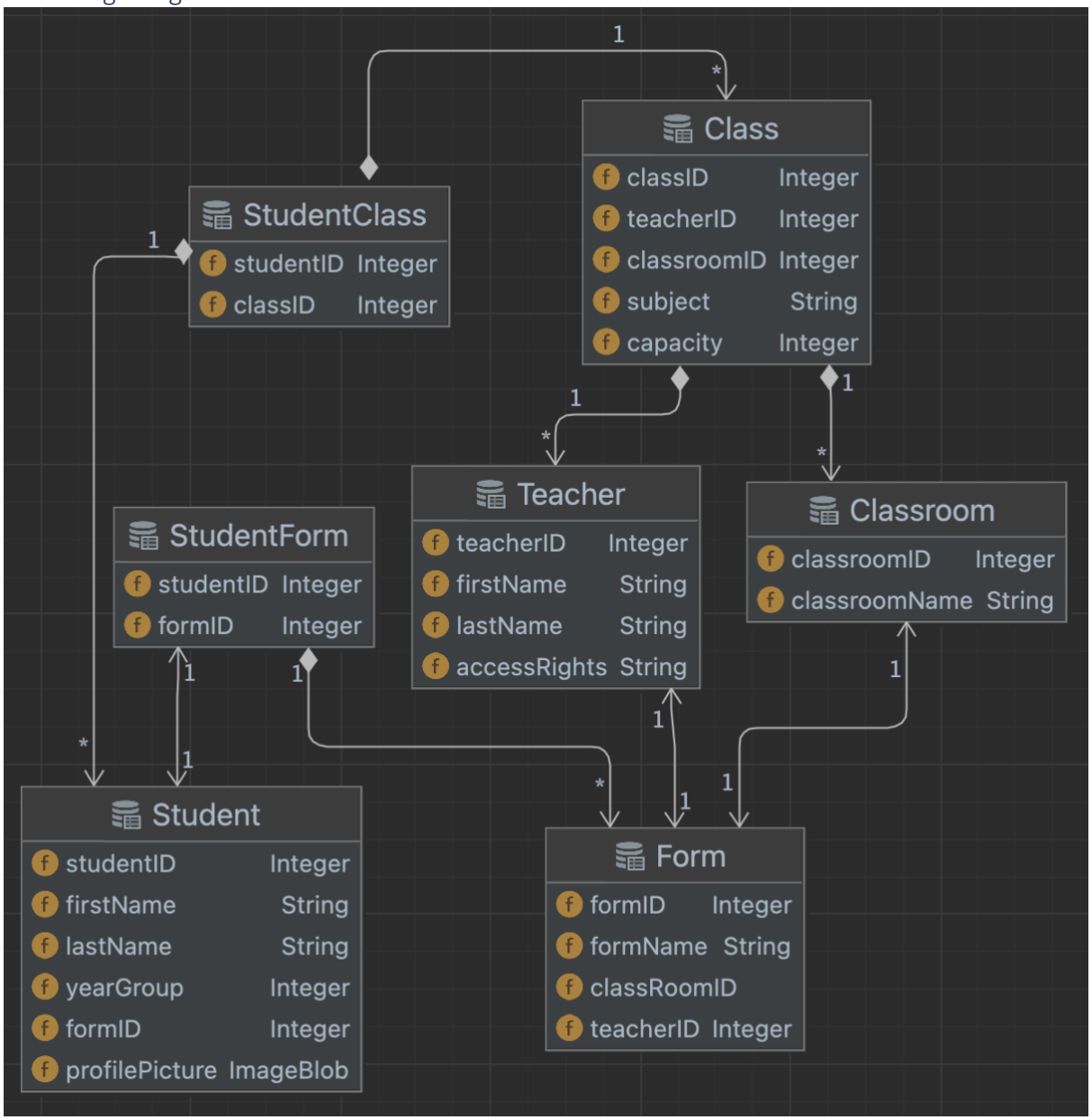
Deploy-prod is the deployment for when we want the commit to be publicly available and accessible, it has all the extra hidden parts removed so we don’t accidentally expose secrets such as the RSA private key. It has deploy-dev as a dependency since it must be able to be deployed to dev first before we can deploy to prod. To deploy, before we run the deploy script we need to install and configure SSH on the gitlab runner. /to do this we first change the permissions of the base of the app by using `chmod og=$RSA`. This changes the ‘owner’ and ‘group’ permission to be the same as the private RSA key file. After this we need to install the openssh-client so that we can ssh into the vm. After this we can deploy the app by running the docker image.

deploy-dev

To deploy to dev, it is the same as prod but with some added steps to setup the deployment server, so it is ready for deployment. This mostly consists of transferring the docker folder onto the deployment server and running `install-app.sh`, which removes the previous version of the app, loads environmental variables, and pulls and configures the docker image.

Subset of UML Diagrams

UML Diagram generated from JDL code



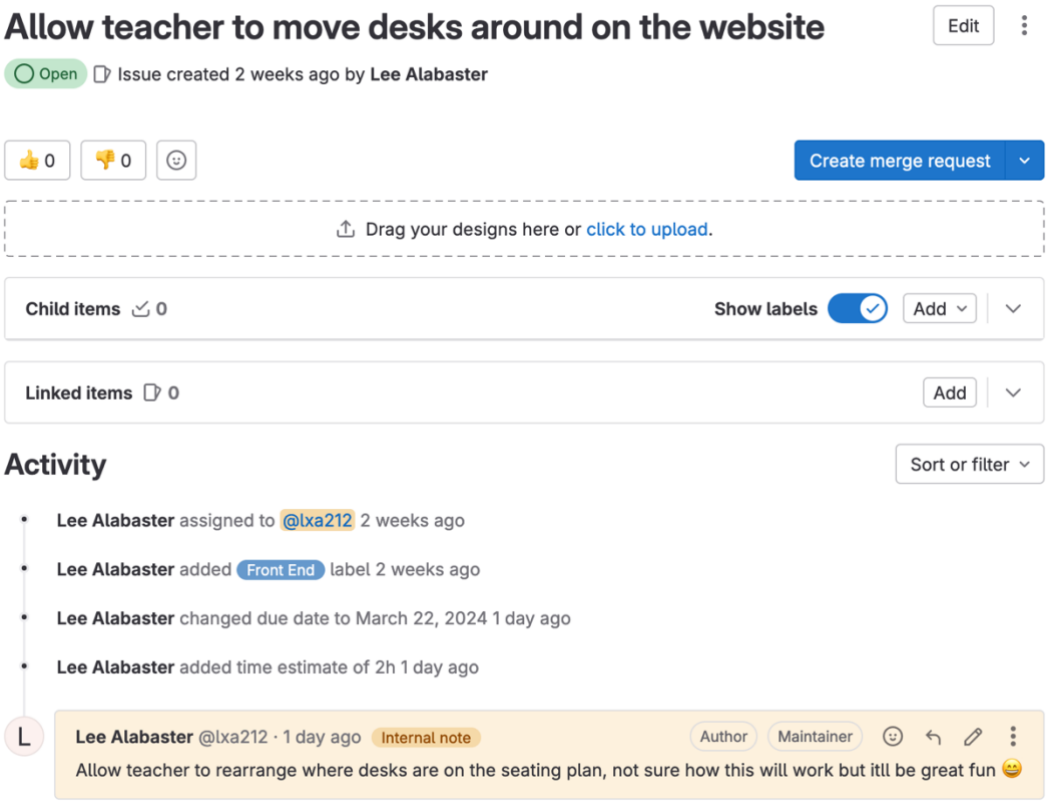
JDL code

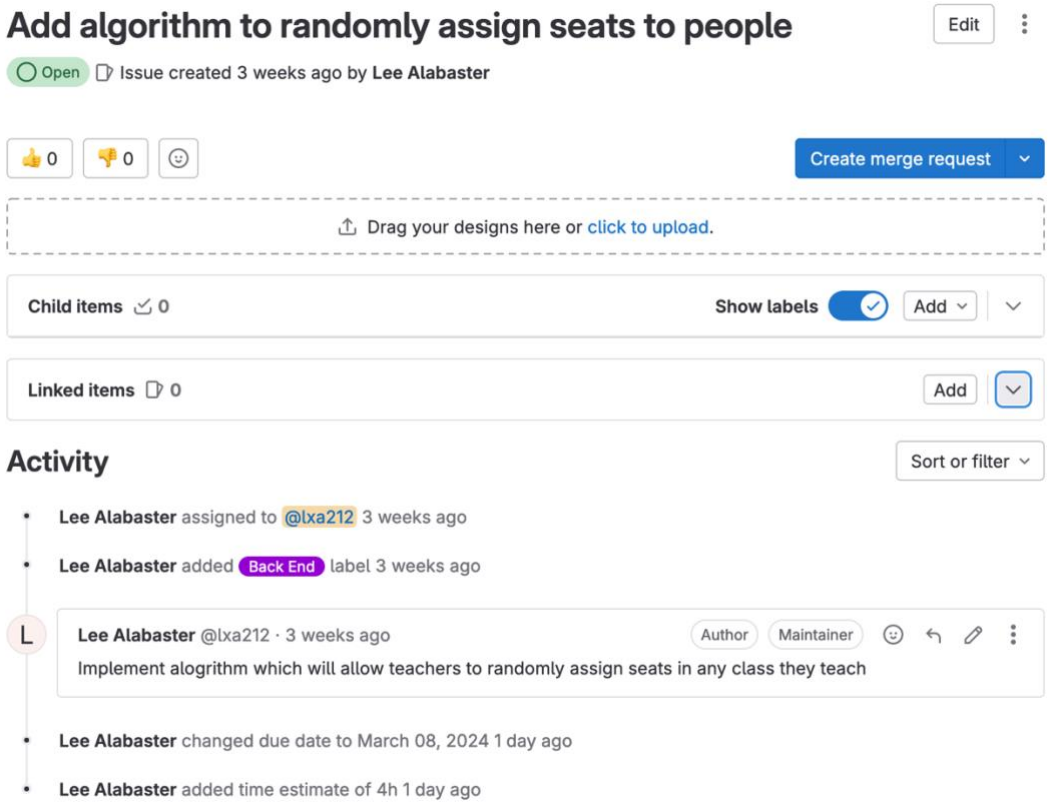
```
entity Student {
    studentID Integer
    firstName String
    lastName String
    yearGroup Integer
    formID Integer
    profilePicture ImageBlob
}


entity Teacher {
    teacherID Integer
    firstName String
    lastName String
    accessRights String
}

entity Class {
    classID Integer
    teacherID Integer
    classroomID Integer
    subject String
    capacity Integer
}

entity Classroom {
    classroomID Integer
    classroomName String
}

entity Form {
    formID Integer
    formName String
    classRoomID
    teacherID Integer
}



entity StudentClass {
    studentID Integer
    classID Integer
}

entity StudentForm {
    studentID Integer
    formID Integer
}
```

```
relationship OneToMany {
    Student to StudentClass
    Teacher to Class
    Class to StudentClass
    Classroom to Class
    Form to StudentForm
}

relationship OneToOne {
    Student to StudentForm
    Form to Teacher
    Form to Classroom
}
```

Kanban Feature Cards

I have 4 kanban feature cards here, all of which are labelled, commented, timestamped with milestones





Read student data from database with a constraint of their class

Edit

Open · Issue created 2 weeks ago by **Lee Alabaster**

0 0

Create merge request

Drag your designs here or click to upload.

Child items 0 **Show labels** Add

Linked items 0 Add

Activity

Sort or filter

- **Lee Alabaster** assigned to @lxa212 2 weeks ago
- **Lee Alabaster** added Back End label 2 weeks ago
- **Lee Alabaster** changed due date to March 15, 2024 1 day ago

L **Lee Alabaster** @lxa212 · 1 day ago Internal note Author Maintainer

Need to read class data to see who is in each class so they can be added to classroom layout

- **Lee Alabaster** added time estimate of 1h 1 day ago

Add links to profiles for each person on screen

Edit

Open · Issue created 2 weeks ago by **Lee Alabaster**

0 0

Create merge request

Drag your designs here or click to upload.

Child items 0 **Show labels** Add

Linked items 0 Add

Activity

Sort or filter

- **Lee Alabaster** assigned to @lxa212 2 weeks ago
- **Lee Alabaster** added Front End label 2 weeks ago
- **Lee Alabaster** changed due date to March 13, 2024 1 day ago
- **Lee Alabaster** added time estimate of 30m 1 day ago

L **Lee Alabaster** @lxa212 · 1 day ago Internal note Author Maintainer

Add link so when you click on a students name it will redirect the user to that students profile, could also do something similar for teacher

- **Lee Alabaster** changed time estimate to 1h from 30m 1 day ago

Timesheets

Here is my timesheet for the dates 14/02 until 27/02, which encompasses all work done for this submission.

Team sheet Number/ID:	lxa212		
Team member name:	Lee Alabaster		
Team representative (secratary	Ethan Breen	**Date from:**	14/02/2024
Team meeting sign off date:	27/02/2024	**Date until:**	27/02/2024

Task	Date	Start time	End time	Total Hours
Tech Report	19/02/2024	12:00	14:00	2
Tech Report	21/02/2024	13:00	14:30	1.5
UML Diagram	23/02/2024	12:00	15:00	3
Kanban Cards	24/02/2024	13:00	14:00	1

Total Hours	**7.5**