

BEng Software & Electronic Engineering

Continuous Integration and Continuous Delivery

Year 3

Continuous Work Assignment

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Table of Contents

[1. Introduction 3](#_Toc143755685)

[2. Explain what you did? 4](#_Toc143755686)

[3. What have you learned (things you would have done differently)? 5](#_Toc143755687)

[4. My Challenges and how I overcame them? 6](#_Toc143755688)

[5. Links( Repositories, Project Management tool, Pipeline) 8](#_Toc143755689)

[6. References 9](#_Toc143755690)

# Introduction

Hello my name is Enoch Abiodun and this is my Repeat Portfolio that I had been working on for the past 2 months in this portfolio I will be describing my Project and the continuous work and learning I did the past 2 months. I hope that my efforts and the amount of work I put will be personified in this document I hope you enjoy reading about my experience and fully grasp and understand how much effort was put in, Thank you for taking the time to read it and explore different aspects of my work.

# Explain what you did?

My name is Enoch Abiodun and in this paragraph I’ll will be talking about what I did through out the 2 months and about what I did do and couldn’t do for my CRUD project . So in this project I set out or I first had in mind more than I accomplished in this two months I started working on my project around 3 weeks to the submission date which was 24th August 2023. I started this time because that’s when I finally completed and went through all the material on the moodle page taken down notes which I scanned and they are located in () and actually thoroughly studying every bit of work and went through all lab questions and pdf lecture notes and completed and followed every flipped video that we went through during the college year there was many concepts like the maven lifecycle and others that took me a considerable amount of time to grasp so I went further in watching YouTube videos in hope concepts would be further broken down so I could understand fully. All the links to most of the videos I watched will be made into a playlist ([CICD Repeat Continuous Work - YouTube](https://www.youtube.com/playlist?list=PLmtas71NLwTcM3_0f0MxzHuPnsH9Lays1)) and I will link various websites and forums also I have went about putting all the zip files of various .idea projects (IntelliJ) in my collective work repository that I made at the beginning of doing work for my continuous repeat work in addition to making videos explaining code for all my lab work and lecture work for extra practice with Git. In terms of my CRUD project I first had a different plan as to where I was going to use Jenkins as a pipeline but before we talk about that. I began the project by writing mock test classes and methods then after I made those I continued to make methods and classes with sort of an Idea of the variables and methods that’s going to be involved in the project before beginning coding I actually wrote out a plan of some of the applications that is going to be involved in the project afte unit testing and making sure all my tests passed after I made sure they all passed I started working on my pipeline I started this by looking for a jenkins image in the docker global repository and install the latest version of jenkins after doing so I ran it on localhost 8080 and made an account and started configuring it with different plugins like git In hope of connected to a repo to clone after all the configuration I tried to then set up a webhook but since jenkins was local and not public github couldn’t find it then I began to search of ways to get it to work. But it was just wasted effort as I tried just using a publicip address and then I tried using an application called ngrok that publises local webservers to the internet but even with that couldn’t get the Github webhook and gave up on using Jenekins and decided to use Gitlab Runner instead. Which again I was unable to get fully integrated with Github and was satifised with how often and when the pipeline would run and the in the PR checks GitLab wouldn’t show even when I did all the mentioned steps so I then decided to move the Github to GitLab repository because it would be more responsive and quicker to have but my repository and pipline in the Gitlab ecosystem because they are already integrated with each other. To copy the code from Github, Gitlab has this feature of mirrorring that can take all the commints and branchs and markdown files and transfer it to Gitlab and not only the code. After I have done this I started on properly configuring the Gitlab ci build yml making stages for the pipeline and then within stages was running maven commands such as “- mvn test verfiy” and running scripts to use jacoco to test the coverage of the code and generate artifacts so we can open the html index file in the target folder after verify phase and just download it in a zip from the pipeline. After I was done configuring the pipeline. After finishing the configuration of the pipeline I then went on to actually working on the spring boot application starting with the Repo of the the project and making sure it was an interface using the class JPA repository that we are going to need to act as our database after wards I worked on my methods for my Service class and finally my Controller which I made some test in relation to boost my codes Coverage. After I was happy with the methods and the capabilities of spring boot classes I then went created a folder with the project called database to act as our volume for when we close our database it doesn’t lose its content as we have a local copy now and also in application.properties we opted for update instead of create - drop because we wanted to keep the contents of our database even when it wasn’t running. After that I went to the terminal to run the steps that we did in the JPA with SpringBoot lab and creating a network called db and running postgres:alpine that is our database and then starting psql terminal in the same network and port so the two can communicate with each other and then I am using a maven spotify plugin to push a jar configuration of my project in a form of an image to Docker all that needs to be changed is the snapshot version in the pom file to keep the version in sync and going upwards in the Docker repository and can be manually push through “mvn clean package dockerfile:push” command in terminal of IntelliJ and n

# What have you learned (things you would have done differently)?

Through out this project and Continuous Work I learned so many things first of all I learned the value of actually putting in the work and starting the work you have been handed as soon as you receive even it is a tiny bit if you check the GitHub repository of my Continuous work portfolio ([G00380316/Continous\_Work\_Portfolio (github.com)](https://github.com/G00380316/Continous_Work_Portfolio)) you will see I started straight away because I decided to actually put in the effort for once and now I have reaped the benefits of doing so as I actually gave myself less stress and also gave myself more time to spend working on everything which allowed me more time to let what I was actually doing sink in and learn them properly and soon all the concepts and different applications became enjoyable I was having fun writing notes and actually doing the work I didn’t even call it work I called it “Study” and it really reminded me on why I decided to partake in this course because I really enjoy coding and learning. Secondly , what I learned is the importance of planning out projects and what work you want to get done in general in a certain amount of time so you can make sure your being productive because I started my project without using my project management tool at first and once bouncing from one thing to another but with Jira software I was able to make a board that had sprints that gives me a certain amount of tasks to do in a certain amount of time before moving on to the next set of tasks in the real-business CICD scrum agile environment sprints are usually two weeks but mine was much shorter as I had a shorter time period then a month to get this project done in an actual agile team it could be a year doing a whole project since it’s at a bigger scale(ex. Building a whole interactive website with search, basket and many more micro services packaged into one). The next thing I learned was basically everything when it comes to the different topics like using git, docker , maven , JPA and SpringBoot I never understood them but after devoting must of my last two months I have truly grasp a good understanding of them and there is still much to learn based on when I was looking for some solutions to some problems on the internet people had different ways of configuring and integrating all these applications together so there is always more to learn. In terms of my Continuous Work Project what I have learned by doing this project is basically the inside and out of applictications such as GitLab I only really needed a few days of studying the UI and functions to become familiar with GitLab as their documentation on their product was clear and concise which also teaches me how clarity and documentation is very important when it comes to code. Other then GitLab I learned actually to run Jenkins off a Docker Image although in the end I didn’t use it in the final project since I reached a road block after I couldn’t configure the localhost address as a webhook for Github to use even after searching online for many solutions even going as far as using an application called “Ngrok” that is made for developers to expose their local websites to the public so this was finally meant to give Jenekins that expore so the webhooks could work but it still didn’t so I decided I spent to much time and changed the scope of the project but before this there was were more callenges and it took some time to overcome like configuring Jenekins and writing code for its Pipeline which I never wrote in groovery at all so had no experience but was able to learn a bit with the help of youtube. But I learned not to waste to much time trying to solve one thing because that was setting me back a lot, I felt if I chose a more less problemic pack I would have been able to put in time in other parts of my portfolio. Moving on I learned so much about writing instructions for piplines running yaml files. I learned indeptly the relations with the controller class and service and the main object class and the repo class because before I was guilty of just following what you were doing in videos but not actually trying to understand like the service class kind of acts as background proccess waiting to be called by the controller class by a what the class is labeled as or tagged as in controlle a Get Http Request or maybe even a post.

# My Challenges and how I overcame them?

There was multiple challenges I had to overcome some weren’t just technical I couldn’t get a certain application or code to work but in terms of connectivity and hardware I went to Nigeria during this 2 months and the value of GitHub/GitLab really shows as I was able to use laptops my relatives had to work because I couldn’t bring my laptop around with me while travelling to various of places. I was also faced with a dilemma of not having stable access to an internet connection so that heavily minimised my productivity and led to me not achieving my goals but at the end still hit the targets of the project but not to the level I wanted. I was in Nigeria for the last 2-3 weeks of the two months and finding the time to work on my project was difficult because of the moving from place to place and visiting Relatives so must of my work was during the night time so that’s how I combated the issue of Time. Moving forward to the technical aspect of difficulties I faced I was trying to use Arraylist with JPA and searched on multiple forums and couldn’t find any examples that helped me so I went with cutting out the extra classes I had like lineItem and Item and just kept the Shopping cart discarding quantity as well because I was running out of time to complete the project. Like I mentioned before I had all the configuration for Jenkins to work where I was apprehended was with my Github web-hook unable to communicate with Jenkins which was on a localhost and I tried exposing that port through Ngrok and yet I was unable to get the webhook communicate leading me to drop the use of Jenkins and moving to Gitlab. I successfully integrated Gitlab Runner and Github but it didn’t really satisfied my needs as I used their mirroring feature to do so and it depends on changes in your repository every like 30 mins which is not frequent enough for me it was set to also run the pipeline on Merge request/pull request but didn’t seem to be working so I see it more beneficial to switch repositories from Github to Gitlab. I was used to writing configuration code for yml files so I had to watch videos and use stackflow to get information and learn how to create stages and write scripts and also use the “awk” function to grab information from the Jacoco csv so I can put the coverage of the project/repository in the build log. When it came the very end of finishing the code I was baffled at the fact that the connection between my database and psql terminal was not there I followed all the steps but in Docker Desktop I could see that psql terminal had made its own container and network and had a dropdown arrow on its container while usually we only see one container and are able to list the relations through the command “/dt” after some research and comparing my two projects the PassengerApi the class tutorial and my project I realised I had an extra dependency in my project which was triggering a Docker compose file in the project which I removed both to get the code to work again as Docker compose file was turning psql into a multi container instead of just letting it be on the same network as our database container /image ( postgres:alpine)

# Links( Repositories, Project Management tool, Pipeline)

1. [G00380316/Continous\_Work\_Portfolio (github.com)](https://github.com/G00380316/Continous_Work_Portfolio)
   1. This link is the Repository for my whole continuous work portfolio. What is in it?
      1. Exercise video projects recorded project files (.idea) are zipped in the Repository (because repositories can’t exist in another one)
      2. Flipped video projects recorded project files (.idea) are zipped in the Repository (because repositories can’t exist in another one)
      3. Useful PNG , txt and folders
      4. A copy of the project files zipped will also be included
2. [CICD Repeat Continuous Work - YouTube](https://www.youtube.com/playlist?list=PLmtas71NLwTcM3_0f0MxzHuPnsH9Lays1)
   1. This link is a link to the videos I recorded in the entire duration of the 2 months and the Continuous Work Portfolio
3. [Enoch Abiodun / Continous\_Work\_Project · GitLab](https://gitlab.com/G00380316/Continous_Work_Project)
   1. [Pipelines · Enoch Abiodun / Continous\_Work\_Project · GitLab](https://gitlab.com/G00380316/Continous_Work_Project/-/pipelines)
      1. The two links above are based on my project and you should be able to run the pipeline for yourself if you make a login for GitLab.
4. [G00380316/Continous\_Work\_Project: Research, design and build a high-quality CICD pipeline to generate a java micro services-based application(Shopping Cart). (github.com)](https://github.com/G00380316/Continous_Work_Project)
   1. This is my Project Repository before I used GitLabs Mirroring feature to transfer my repository over to their platform with commits, comments and etc. also being transferred so it was almost like I was using GitLab from the beginning of the project
5. [Your Stars (github.com)](https://github.com/G00380316?tab=stars)
   1. This has every Repository based on the Continuous work listed and Starred
6. [Shopping Cart - Timeline - Jira (atlassian.net)](https://enochabiodun128.atlassian.net/jira/software/projects/SC/boards/1/timeline)
   1. [SC board - Agile board - Jira (atlassian.net)](https://enochabiodun128.atlassian.net/jira/software/projects/SC/boards/1)
      1. This the link for my project planning I chose a scrum format of project planning and management because of the most popular types of team working environment as a Software Engineer is the Agile style environment (a project management approach that involves breaking the project into phases and emphasizes continuous collaboration and improvement)
      2. To access my board and backlogs my whole Project you will need an account I made an account for you that I will delete later with a new email (Email: p79613992@gmail.com , Password: Project1234 , link: [SC board - Agile board - Jira (atlassian.net)](https://enochabiodun128.atlassian.net/jira/software/projects/SC/boards/1)) Note\* if asked for site end random one and once logged in just click the link above
7. [Repositories | Docker Hub](https://hub.docker.com/repositories/g00380316)
   1. This is the link for my Docker Repository for any image pushes to Docker
   2. Check readme file on how to push properly to Docker

# References

* [YouTube References Continuous Project - YouTube](https://www.youtube.com/playlist?list=PLmtas71NLwTfVo72KKCefq2RLTAZ775pR)
* [maven - Code coverage report using gitlab-ci.yml file - Stack Overflow](https://stackoverflow.com/questions/48032798/code-coverage-report-using-gitlab-ci-yml-file)
* [How to expose your localhost server using Ngrok | by Reyhan | Medium | Medium](https://reyhann.medium.com/how-to-expose-your-localhost-server-using-ngrok-9928ac2e26b8)
* [Fix: An Attempt Was Made to Access a Socket in a Way Forbidden by its Access Permissions - Appuals.com](https://appuals.com/fix-an-attempt-was-made-to-access-a-socket-in-a-way-forbidden-by-its-access-permissions/)
* [git - Unable to connect to GitHub API: org.kohsuke.github.HttpException - Stack Overflow](https://stackoverflow.com/questions/66384843/unable-to-connect-to-github-api-org-kohsuke-github-httpexception)
* [Webhook Error: Issue while integrating Github with Jenkins - Stack Overflow](https://stackoverflow.com/questions/59208288/webhook-error-issue-while-integrating-github-with-jenkins)
* [Jenkins GitHub Integration | How to Do It | Blazemeter by Perforce](https://www.blazemeter.com/blog/how-to-integrate-your-github-repository-to-your-jenkins-project)
* [GetMapping - IntelliJ IDEA Guide (jetbrains.com)](https://www.jetbrains.com/idea/guide/tutorials/marco-codes-spring-boot/get-mapping/)
* [dev environment means - Google Search](https://www.google.com/search?q=dev+environment+means&oq=dev+envirm&aqs=edge.4.69i57j0i10i512l8.5059j0j1&sourceid=chrome&ie=UTF-8#vhid=c0WY_7KGeQEhPM&vssid=l)
* [Understanding Docker Networking - Earthly Blog](https://earthly.dev/blog/docker-networking/)
* [Docker Networking Basics | dockerlabs (collabnix.com)](https://dockerlabs.collabnix.com/networking/A1-network-basics.html)