St. Francis Institute of Technology, Mumbai-400 103
Department Of Information Technology

A.Y. 2023-2024
Class: TE-ITA/B, Semester: V

Subject: **DevOps Lab**

Experiment – 5: To implement continuous integration with Jenkins

1. **Aim:** To implement continuous integration with Jenkins
2. **Objectives:** Aim of this experiment is that, the students will be able
   - To Integrate and deploy tools like Jenkins and Maven, which is used to build applications in DevOps environment
3. **Outcomes:** After study of this experiment, the students will be able
   - To understand the importance of Jenkins to Build and deploy Software Applications on server environment.
   - Learn about Jenkins (With Architecture)
   - To have introduction to Maven / Gradle / Ant
4. **Prerequisite:** Knowledge of software engineering concept of integration
5. **Requirements:** Jenkins, JDK, python, ANT, Personal Computer, Windows operating system, browser, Internet Connection, Microsoft Word.
6. **Pre-Experiment Exercise:**
   Brief Theory: Refer shared material
7. **Laboratory Exercise**
   A. **Procedure:**
      a. **Answer the following:**
         - Explain continuous integration :
           Continuous Integration (CI) is a software development practice where code changes from multiple developers are automatically integrated into a shared repository. It involves automated builds, testing, and rapid feedback to catch and fix issues early in the development cycle. This process ensures code quality, speeds up development, and encourages collaboration among team members. CI is a fundamental practice in modern software development, promoting consistency and reliability.
         - Why Jenkins is popular? Mention advantages:
           Jenkins is a popular and widely used open-source automation server primarily because of its numerous advantages and features that make it a go-to choice for many organizations. Some of the key advantages of Jenkins include:
           1. Open-source flexibility.
           2. A vast plugin ecosystem.
           3. Easy setup and configuration.
           4. Scalability options.
           5. Customizability for tailored pipelines.
           6. Strong community support.
           7. Seamless integration with other tools.
           8. Robust security features.
           9. Scheduled builds for automation.
           10. Cross-platform compatibility.

           These advantages make Jenkins a versatile and widely used tool for continuous integration and continuous delivery (CI/CD).

      b. **Execute following (Refer the shared material) and attach screenshots:**
         - Build jobs in Jenkins

8. **Post-Experiments Exercise**
   A. **Extended Theory:**

Nil

B. Questions:

- How is continuous integration achieved using Jenkins?
- Have you created a build job in Jenkins? Explain how to do it.
- What are the types of jobs or projects in Jenkins?

C. Conclusion:

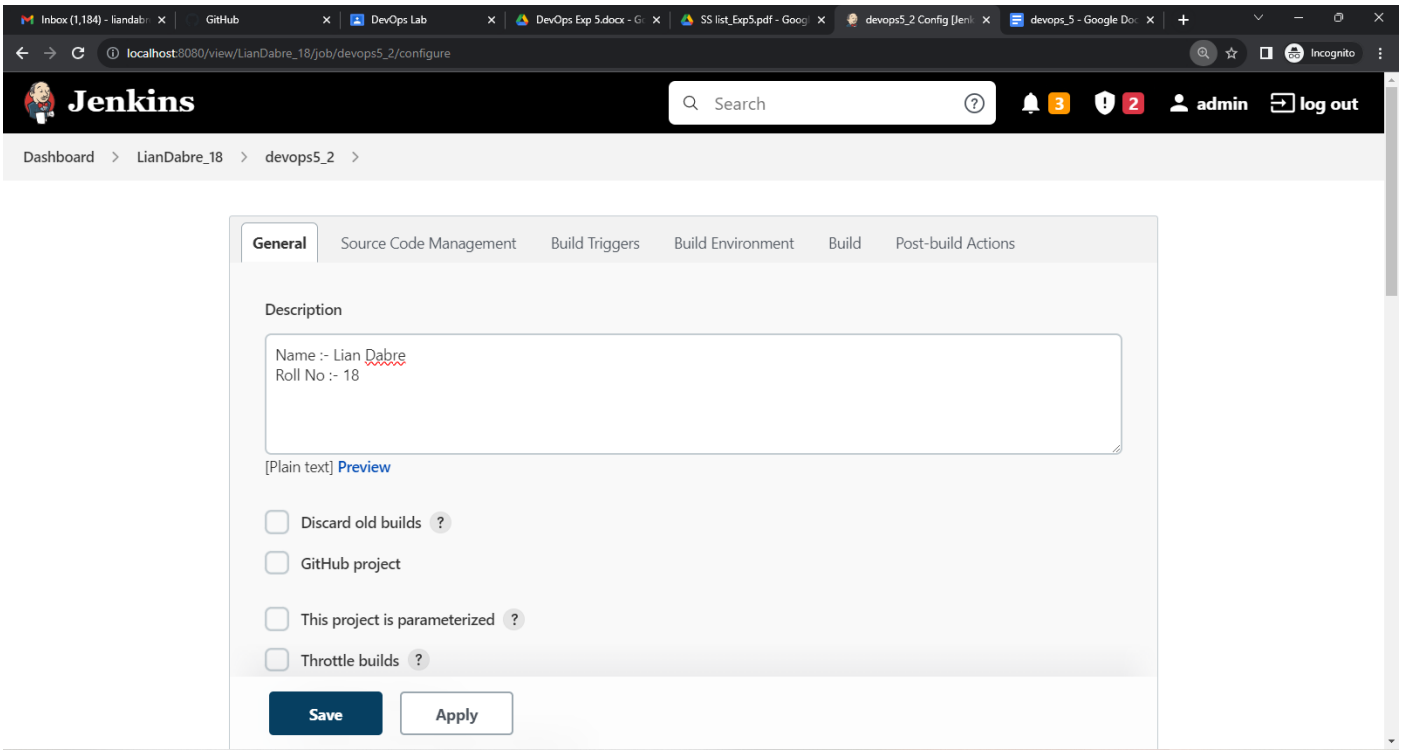
- Write what was performed in the experiment.
- Write the significance of the topic studied in the experiment.

D. References:

https://jenkins.io/doc/
https://www.cloudbees.com/jenkins/what-is-jenkins
https://vmokshagroup.com/blog/what-is-jenkins/
https://www.infoworld.com/article/3239666/what-is-jenkins-the-ci-server-explained.html
https://hackr.io/blog/jenkins-interview-questions
https://www.edureka.co/blog/interview-questions/jenkins-interview-questions/

Build jobs in Jenkins

Python freestyle project – simple python script (implicit)



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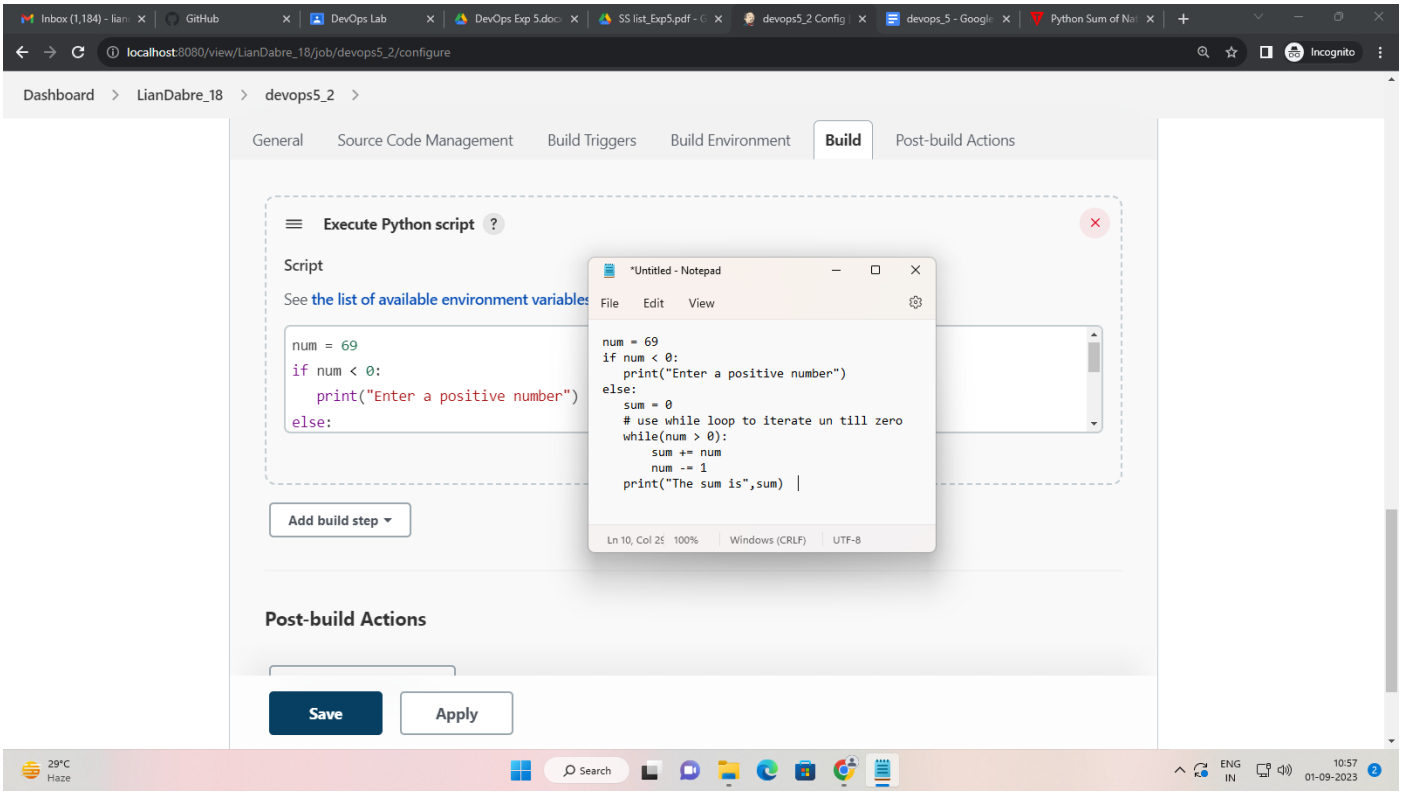

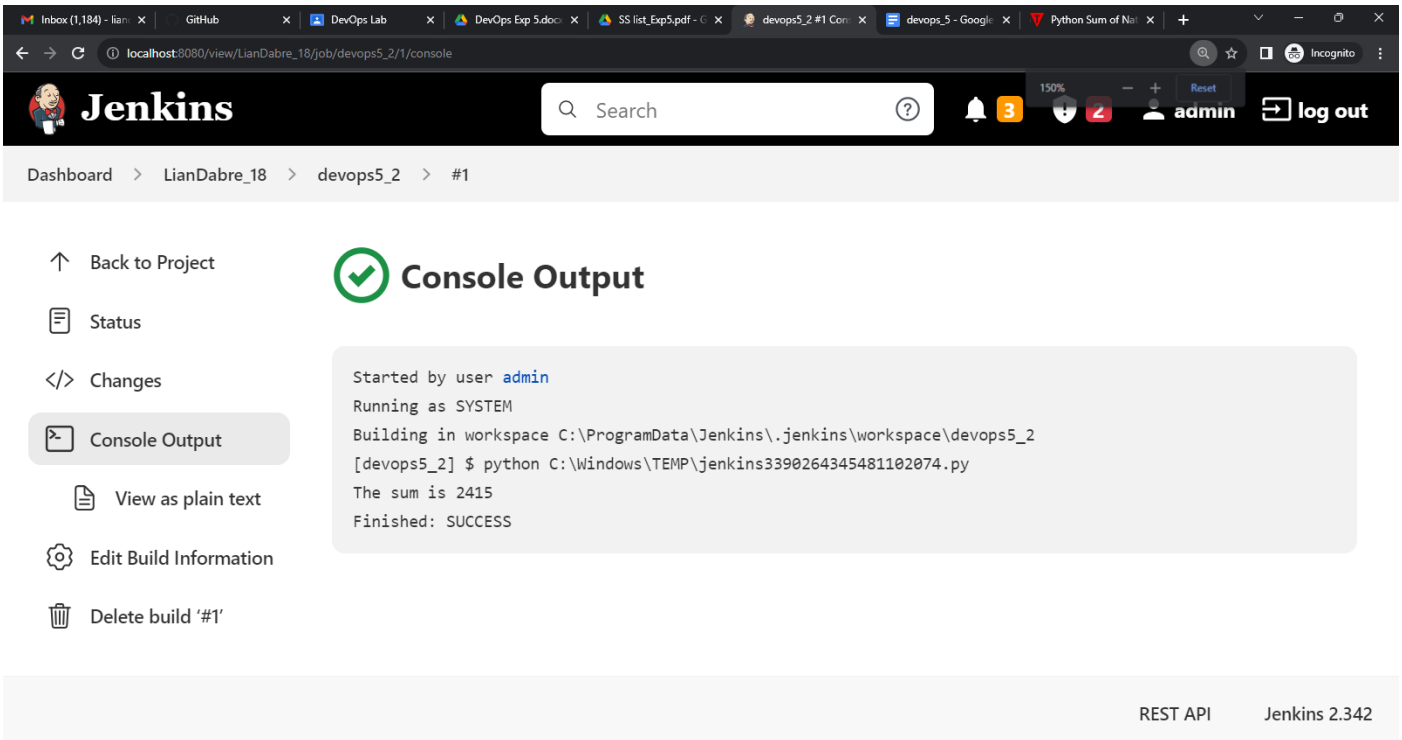

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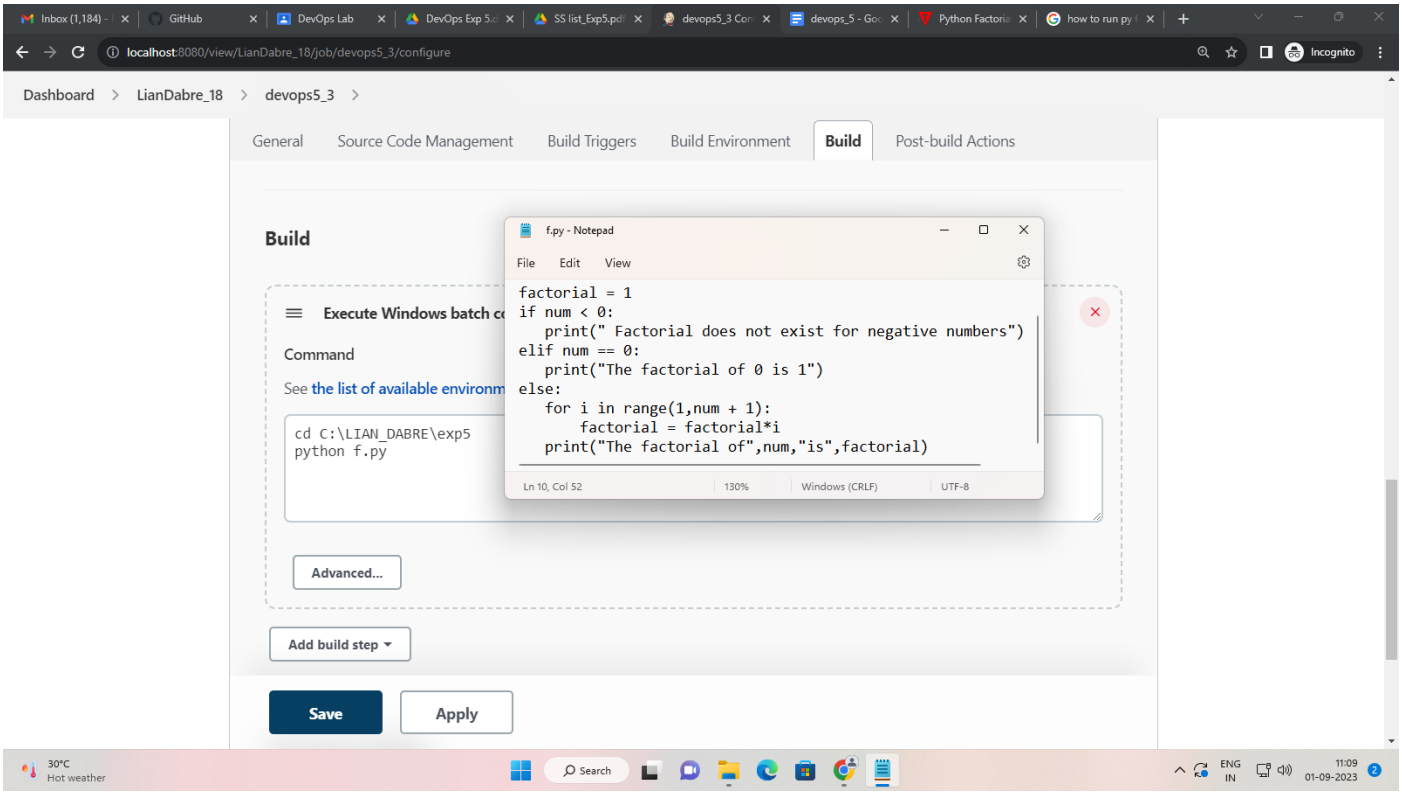
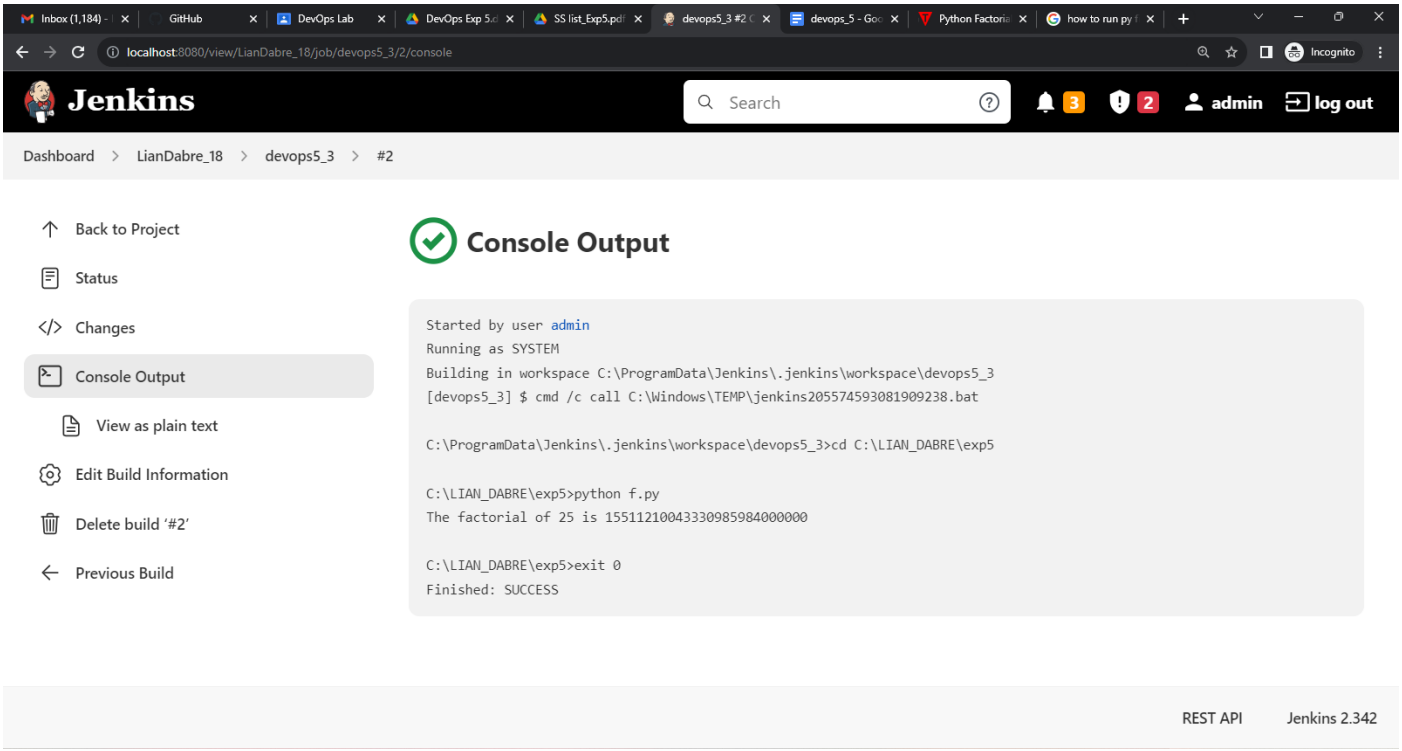
Python freestyle project – simple python file (explicit)





Maven freestyle project – Fork repository and Build goals, verify creation of jar/war

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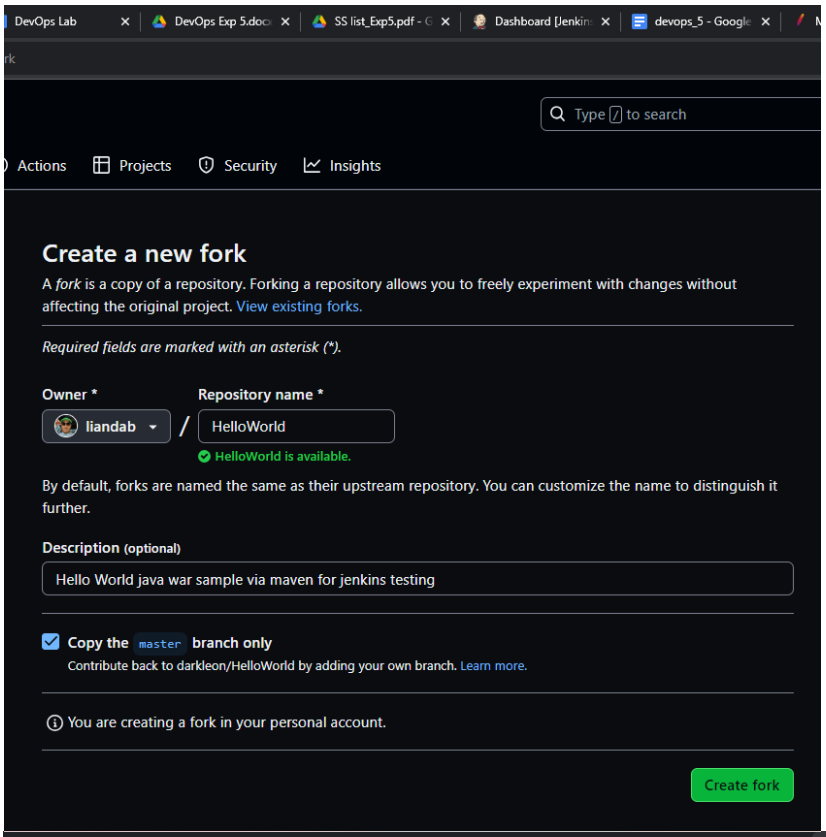

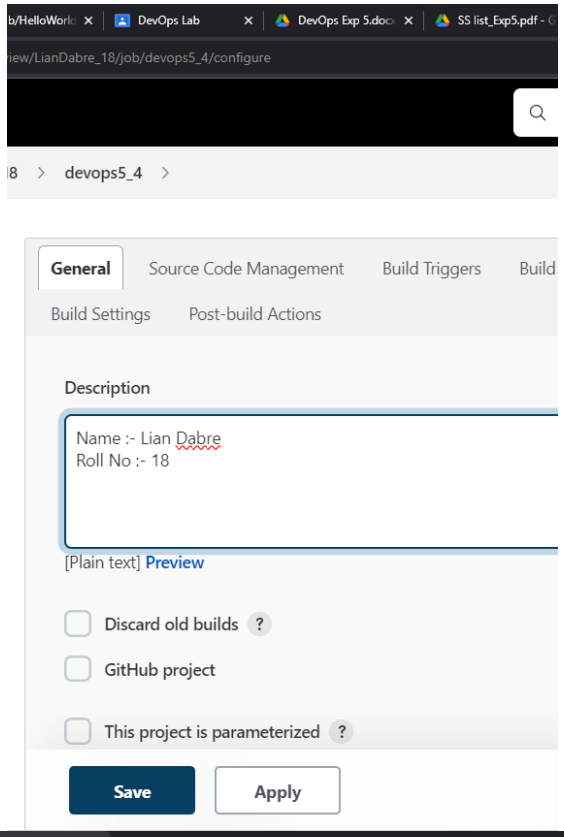

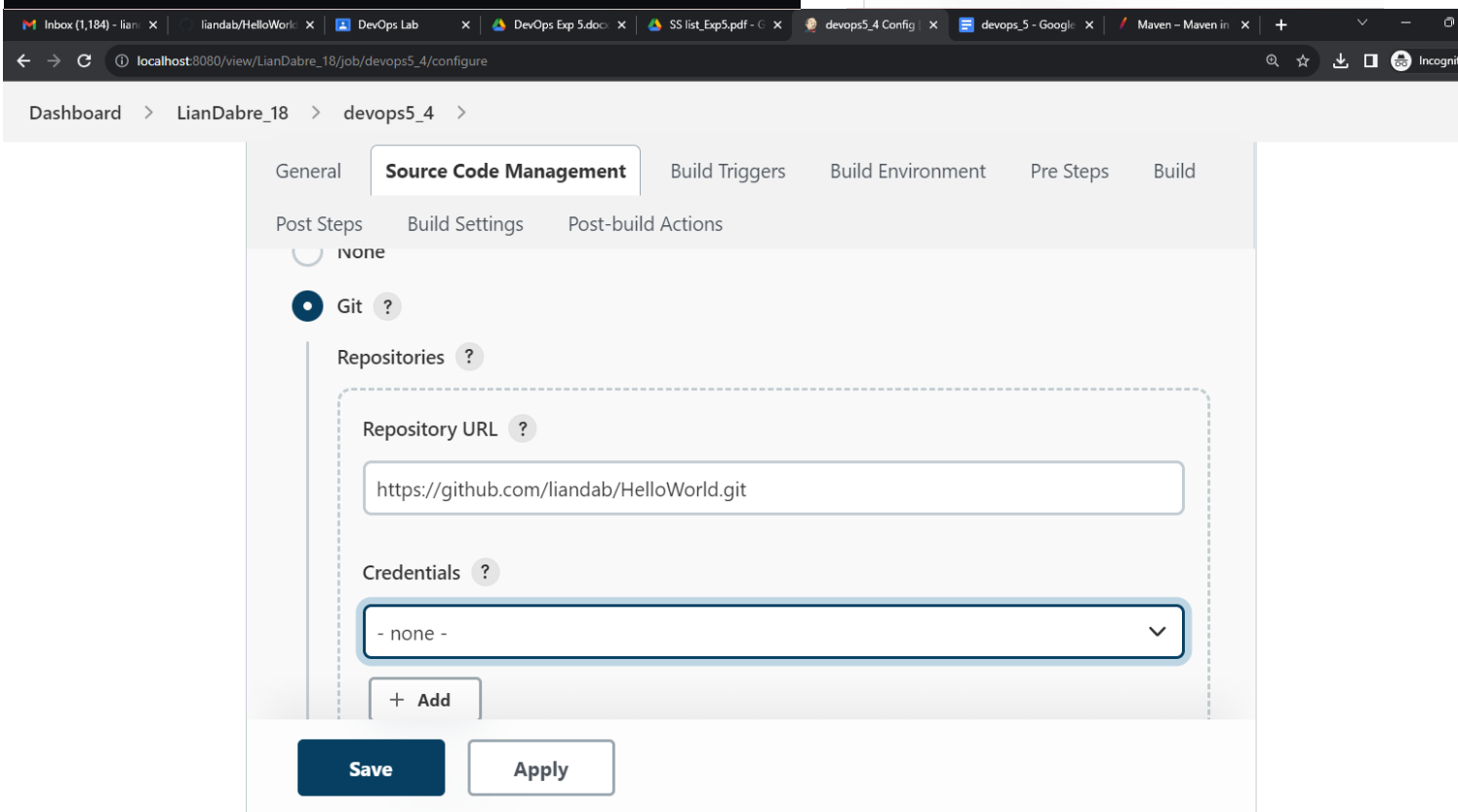

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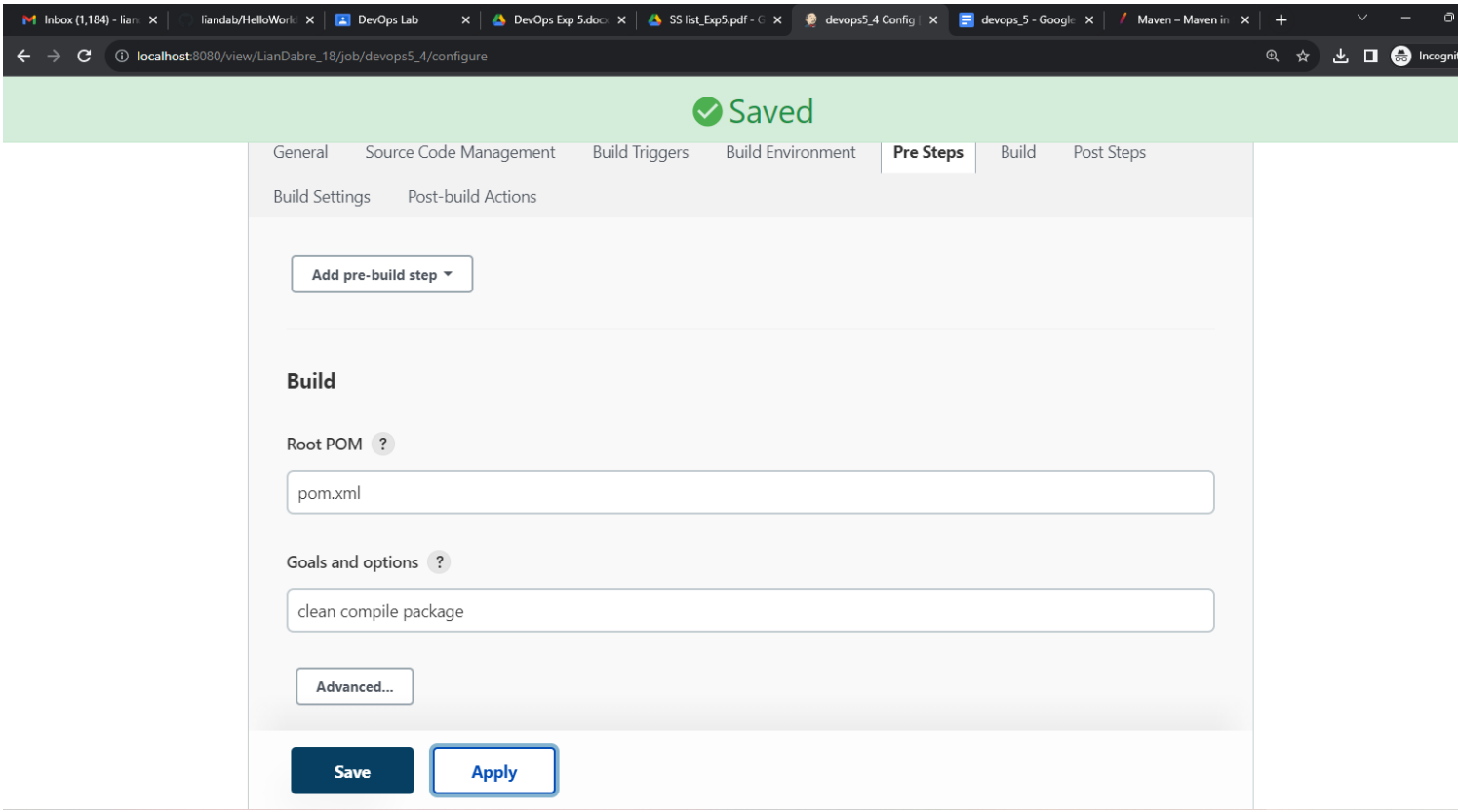

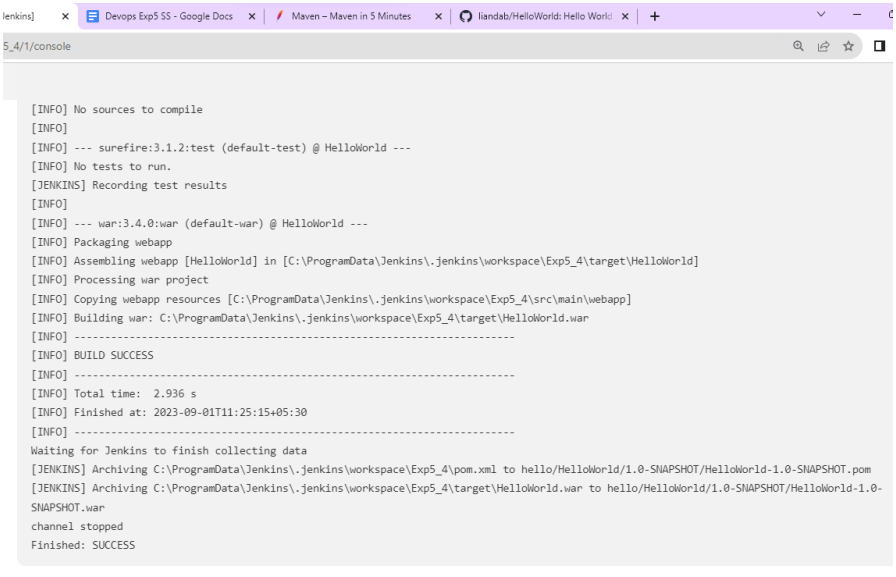

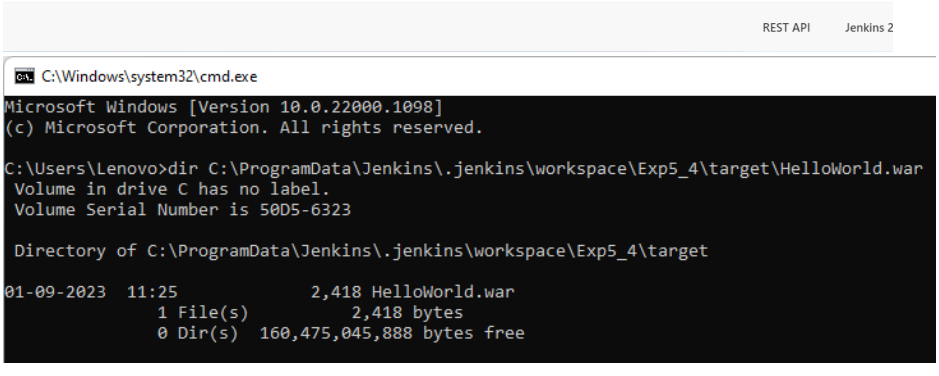

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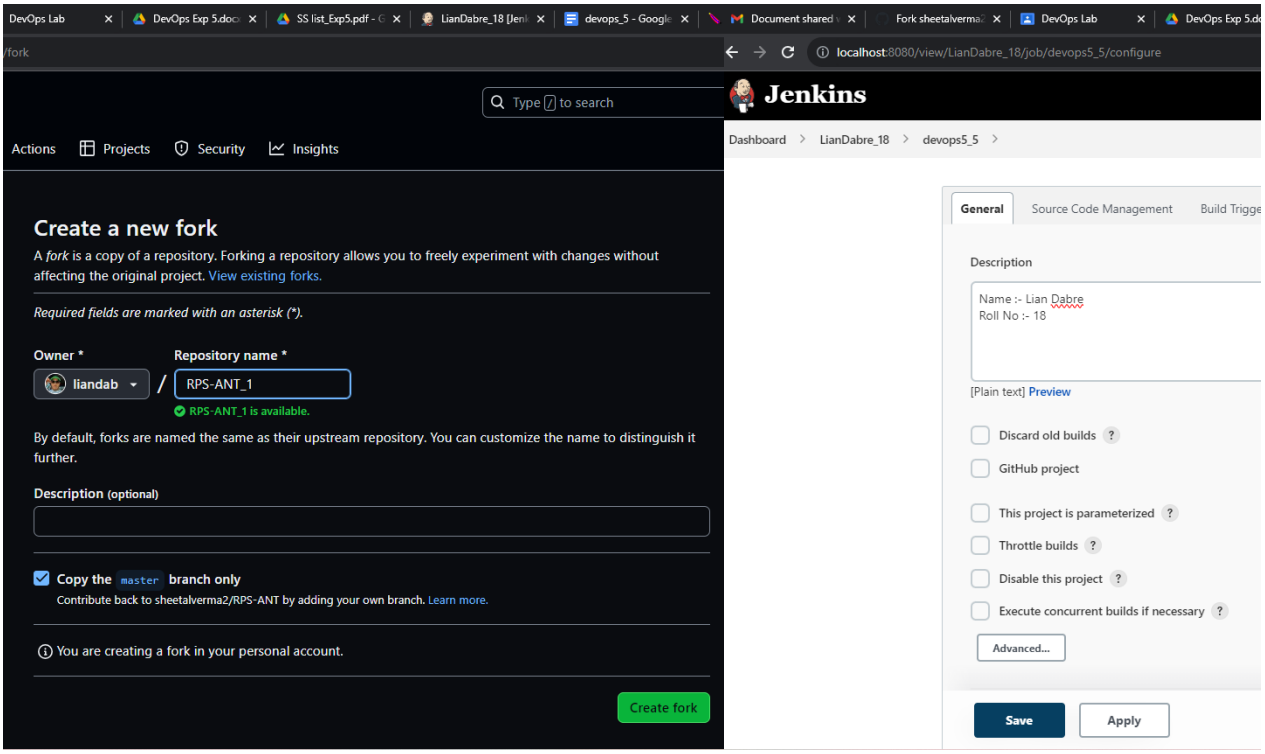
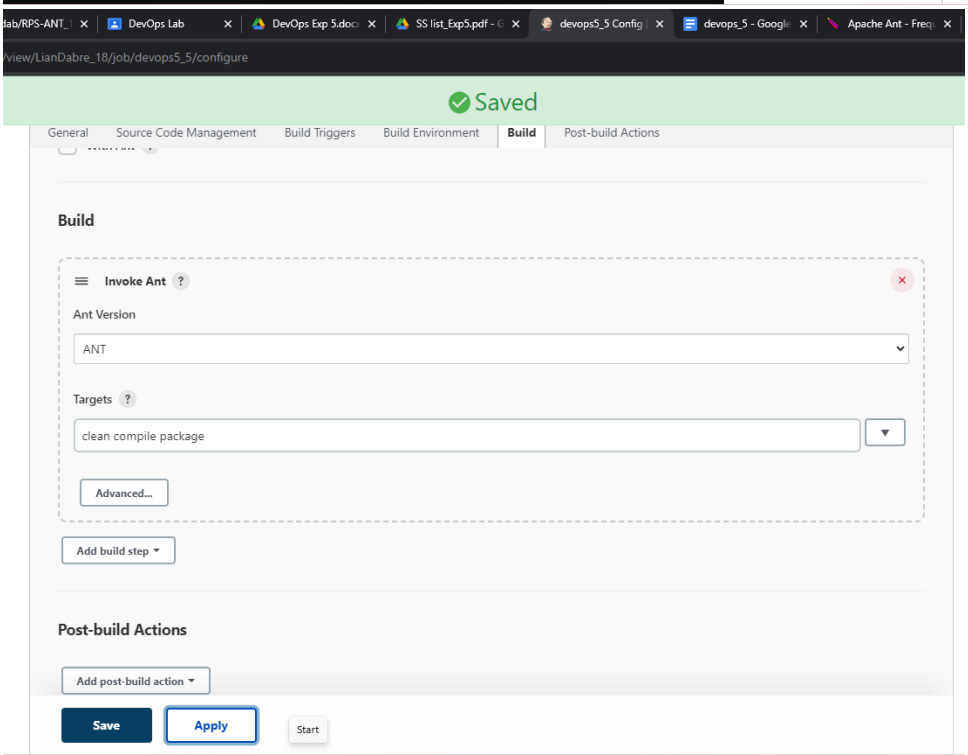
Ant freestyle project - Fork repository and Build goals, verify creation of jar/war





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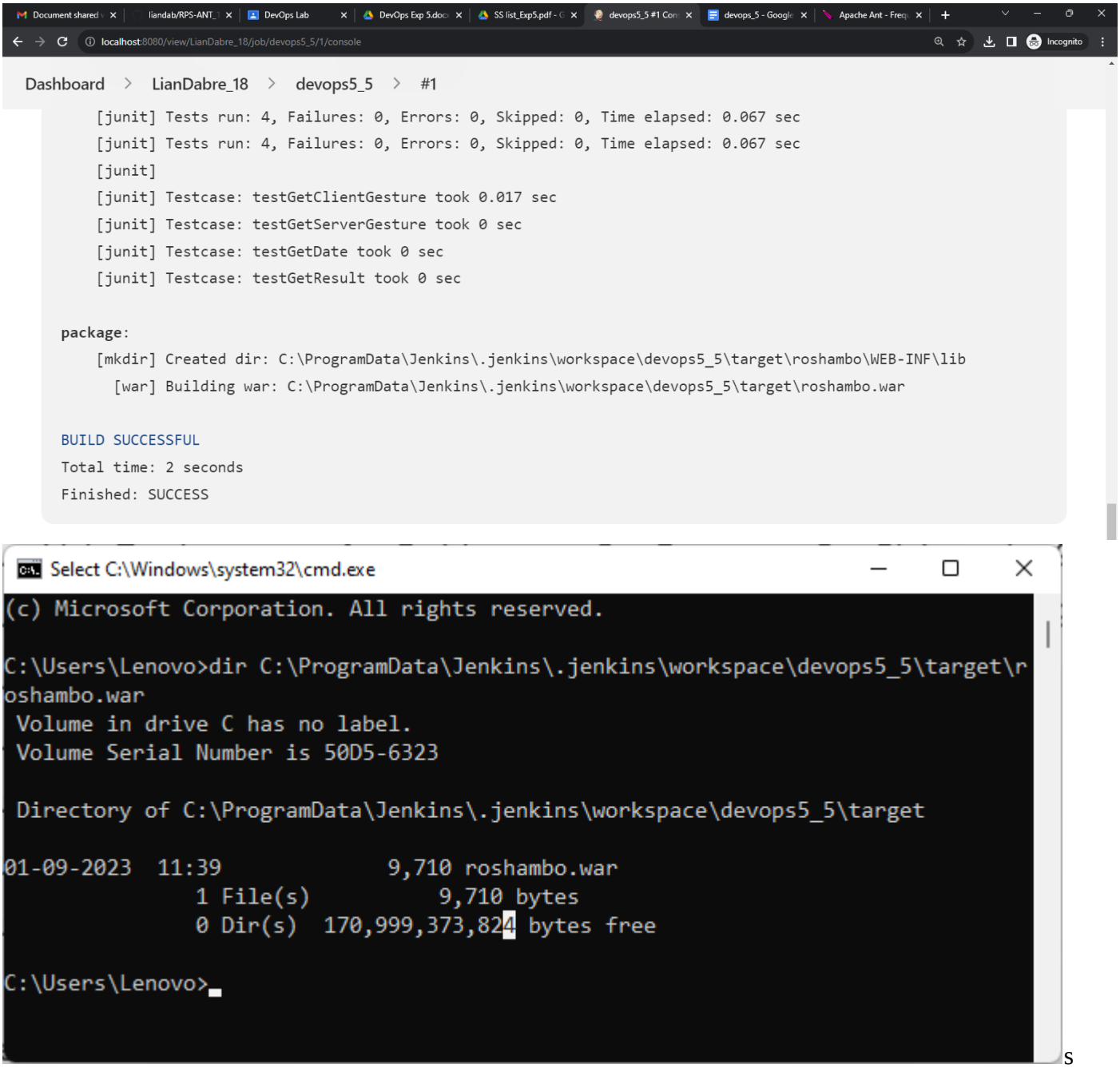

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