Part 1: Setup Jenkins on your machine

Start the orchestration

```
  GNU nano 6.2                                                    Dockerfile
FROM jenkins/jenkins:latest
USER root
RUN apt-get update && apt-get install -y lsb-release ca-certificates curl && \
    install -m 0755 -d /etc/apt/keyrings && \
    curl -fsSL https://download.docker.com/linux/debian/gpg -o /etc/apt/keyrings/docker.asc && \
    chmod a+r /etc/apt/keyrings/docker.asc && \
    echo "deb [arch=$(dpkg --print-architecture) signed-by=/etc/apt/keyrings/docker.asc] \
    https://download.docker.com/linux/debian $(. /etc/os-release && echo \"$VERSION_CODENAME\") stable" \
    | tee /etc/apt/sources.list.d/docker.list > /dev/null && \
    apt-get update && apt-get install -y docker-ce-cli && \
    apt-get clean && rm -rf /var/lib/apt/lists/*
USER jenkins
RUN jenkins-plugin-cli --plugins "blueocean docker-workflow"
```

```
  GNU nano 6.2                          docker-compose.yml *
version: '3.1'

services:
  docker:
    image: docker:dind
    privileged: true
    environment:
      - DOCKER_TLS_CERTDIR=/certs
    volumes:
      - ./jenkins-docker-certs:/certs/client
      - ./jenkins-data:/var/jenkins_home

  jenkins-blueocean:
    build: .
    environment:
      - DOCKER_HOST=tcp://docker:2376
      - DOCKER_CERT_PATH=/certs/client
      - DOCKER_TLS_VERIFY=0
    ports:
      - 8080:8080
      - 50000:50000
    volumes:
      - ./jenkins-data:/var/jenkins_home
      - ./jenkins-docker-certs:/certs/client:ro

networks:
  jenkins:
    name: jenkins
    driver: bridge
```

Unlock and select plugins to install

Getting Started

✓ Folders Plugin	✓ OWASP Markup Formatter	✓ Build Timeout	✓ Credentials Binding Plugin	** JSON Path API
✓ Timestamper	✓ Workspace Cleanup	✓ Ant	✓ Gradle	** Token Macro
✓ Pipeline	✓ GitHub Branch Source	✓ Pipeline: GitHub Groovy Libraries	✓ Pipeline Graph View	Build Timeout
✓ Git plugin	✓ SSH Build Agents	✓ Matrix Authorization Strategy	○ PAM Authentication	Credentials Binding
○ LDAP	↻ Email Extension	○ Mailer Plugin	○ Dark Theme	Timestamper
○ Dashboard View	↻ Git Parameter	✓ GitHub	↻ GitLab	** Resource Disposer

Right panel list:
- ** JSON Path API
- ** Token Macro
- Build Timeout
- Credentials Binding
- Timestamper
- ** Resource Disposer
- Workspace Cleanup
- Ant
- Gradle
- Pipeline
- GitHub
- GitHub Branch Source
- Pipeline: GitHub Groovy Libraries
- ** Metrics
- Pipeline Graph View
- Git
- ** EDDSA API
- ** Trilead API
- SSH Build Agents
- Matrix Authorization Strategy

** - required dependency

Jenkins 2.503

Create Admin profile

Create First Admin User

Username

bojana.andonova

Password

••••••••••

Confirm password

••••••••••

Full name

Bojana Andonova

E-mail address

Jenkins 2.503

Skip and continue as admin   Save and Continue

Create an ngrok temporary public URL

```
bojana@Dell:/mnt/c/Users/Bojana$ /mnt/c/ProgramData/chocolatey/bin/ngrok.exe http 8080
◆  Protect endpoints w/ IP Intelligence: https://ngrok.com/r/ipintel

Session Status                online
Account                       bojana.andonova3@gmail.com (Plan: Free)
Update                        update available (version 3.22.0, Ctrl-U to update)
Version                       3.20.0
Region                        Europe (eu)
Latency                       49ms
Web Interface                 http://127.0.0.1:4040
Forwarding                    https://0b25-77-29-190-195.ngrok-free.app -> http://localhost:8080

Connections                   ttl     opn     rt1     rt5     p50     p90
                              0       0       0.00    0.00    0.00    0.00
```

Getting Started

Instance Configuration

Jenkins URL:

https://0b25-77-29-190-195.ngrok-free.app

The Jenkins URL is used to provide the root URL for absolute links to various Jenkins resources. That means this value is required for proper operation of many Jenkins features including email notifications, PR status updates, and the BUILD_URL environment variable provided to build steps.

The proposed default value shown is **not saved yet** and is generated from the current request, if possible. The best practice is to set this value to the URL that users are expected to use. This will avoid confusion when sharing or viewing links.

Jenkins 2.503   Not now   Save and Finish

Setup secret credentials
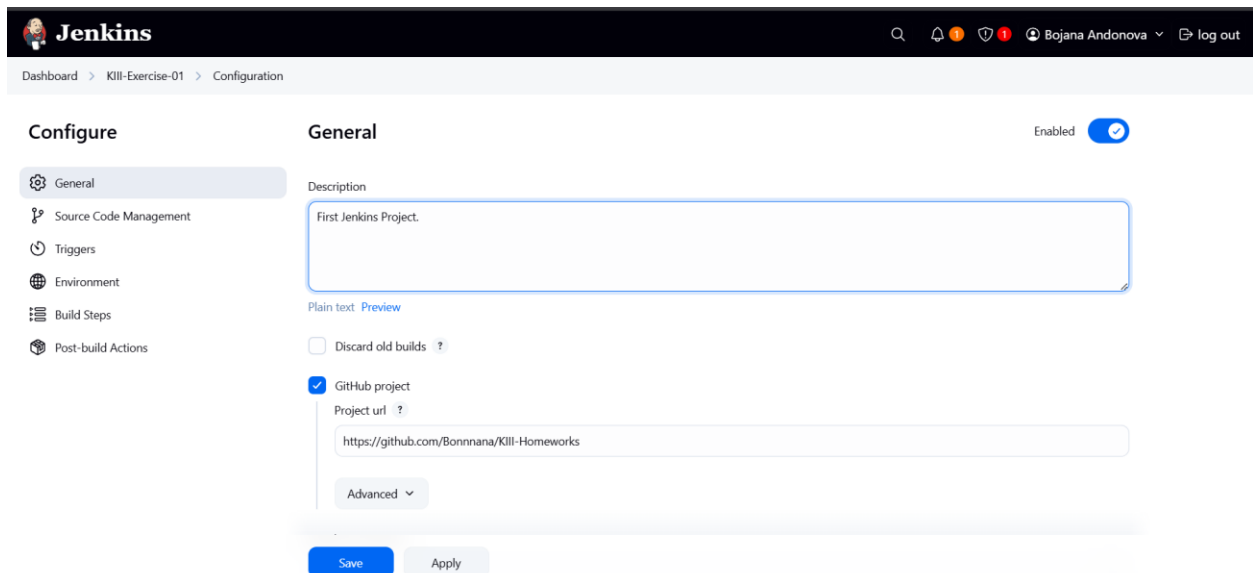
Global credentials (unrestricted)   + Add Credentials

Credentials that should be available irrespective of domain specification to requirements matching.

	ID	Name	Kind	Description	
📱	github-token	GitHub token for accessing repos from Jenkins	Username with password	GitHub token for accessing repos from Jenkins	🔧
📱	dockerhub	DockerHub token for Jenkins	Username with password	DockerHub token for Jenkins	🔧

Icon: S   M   L

Part 2: Create a Freestyle project

Connect it to a simple GitHub repository from your account

Set up an automatic build, on each minute

Configure

- General
- Source Code Management
- **Triggers**
- Environment
- Build Steps
- Post-build Actions

Triggers

Set up automated actions that start your build based on specific events, like code changes or scheduled times.

- ☐ Trigger builds remotely (e.g., from scripts) ?
- ☐ Build after other projects are built ?
- ☑ Build periodically ?

  Schedule ?

  ```
  * * * * *
  ```

  ⚠ Do you really mean "every minute" when you say "* * * * *"? Perhaps you meant "H * * * *" to poll once per hour
  Would last have run at Sunday, March 30, 2025 at 12:01:00 PM Coordinated Universal Time; would next run at Sunday, March 30, 2025 at 12:02:00 PM Coordinated Universal Time.

- ☐ Build when a change is pushed to GitLab. GitLab webhook URL: https://0b25-77-29-190-195.ngrok-free.app/project/KIII-Exercise-01 ?
- ☐ GitHub hook trigger for GITScm polling ?
- ☐ Poll SCM ?

Save Apply

Add a Build Step with a simple ls -l command

Configure

- General
- Source Code Management
- Triggers
- Environment
- **Build Steps**
- Post-build Actions

Build Steps

Automate your build process with ordered tasks like code compilation, testing, and deployment.

☰ **Execute shell** ?   ✕

Command

See the list of available environment variables

```
ls -l
```

Advanced ⌄

Add build step ⌄

Post-build Actions

Save Apply

Project builds

Jenkins   Bojana Andonova   log out

Dashboard > KIII-Exercise-01 >

✅ **KIII-Exercise-01**   ✏️ Edit description

- Status
- Changes
- Workspace
- Build Now
- Configure
- Delete Project
- GitHub
- Favorite
- Open Blue Ocean
- Rename

First Jenkins Project.

Permalinks

- Last build (#2), 56 sec ago
- Last stable build (#2), 56 sec ago
- Last successful build (#2), 56 sec ago
- Last completed build (#2), 56 sec ago

Builds   ⋯   ⤢

🔍 Filter   /

Today

Jenkins   Bojana Andonova   log out

Dashboard > KIII-Exercise-01 > #3 > Console Output

- Status
- Changes
- Console Output
- Edit Build Information
- Delete build '#3'
- Timings
- Git Build Data
- Open Blue Ocean
- ← Previous Build
- → Next Build

✅ **Console Output**   ⬇ Download   🗐 Copy   View as plain text

```
Started by timer
Running as SYSTEM
Building in workspace /var/jenkins_home/workspace/KIII-Exercise-01
The recommended git tool is: NONE
using credential git-token-2
 > git rev-parse --resolve-git-dir /var/jenkins_home/workspace/KIII-Exercise-01/.git # timeout=10
Fetching changes from the remote Git repository
 > git config remote.origin.url https://github.com/Bonnnana/KIII-Homeworks.git # timeout=10
Fetching upstream changes from https://github.com/Bonnnana/KIII-Homeworks.git
 > git --version # timeout=10
 > git --version # 'git version 2.39.5'
using GIT_ASKPASS to set credentials Git token for Jenkins Freestyle project
 > git fetch --tags --force --progress -- https://github.com/Bonnnana/KIII-Homeworks.git +refs/heads/*:refs/remotes/origin/* # timeout=10
Seen branch in repository origin/develop
Seen branch in repository origin/main
Seen branch in repository origin/production
Seen branch in repository origin/test
Seen 4 remote branches
 > git show-ref --tags -d # timeout=10
Checking out Revision 909426f7f4111a83435fc91965662ac5090acdf0 (origin/main)
 > git config core.sparsecheckout # timeout=10
```

Part 3: Create a Pipeline in Blue Ocean

Create a new GitHub repository with the supplied Dockerfile and Jenkinsfile files
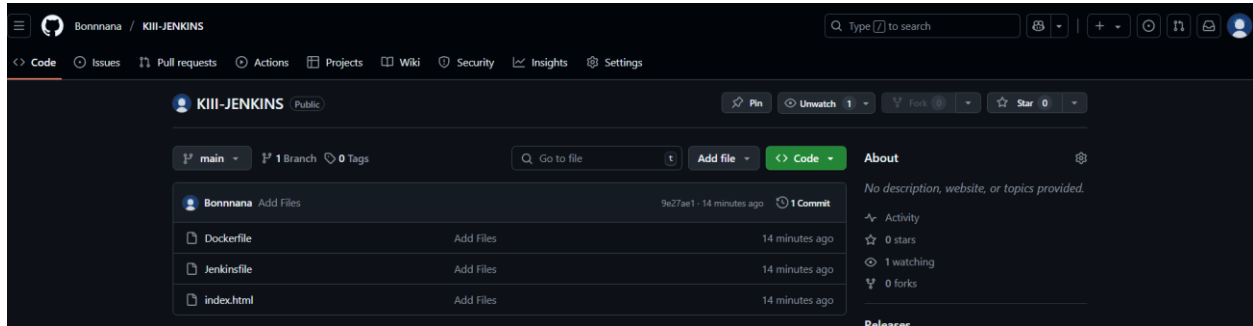
Create a new Pipeline with Blue Ocean and connect it to the GitHub repo
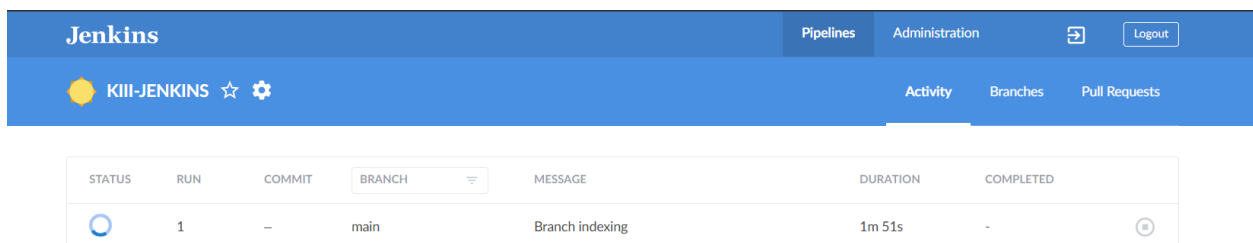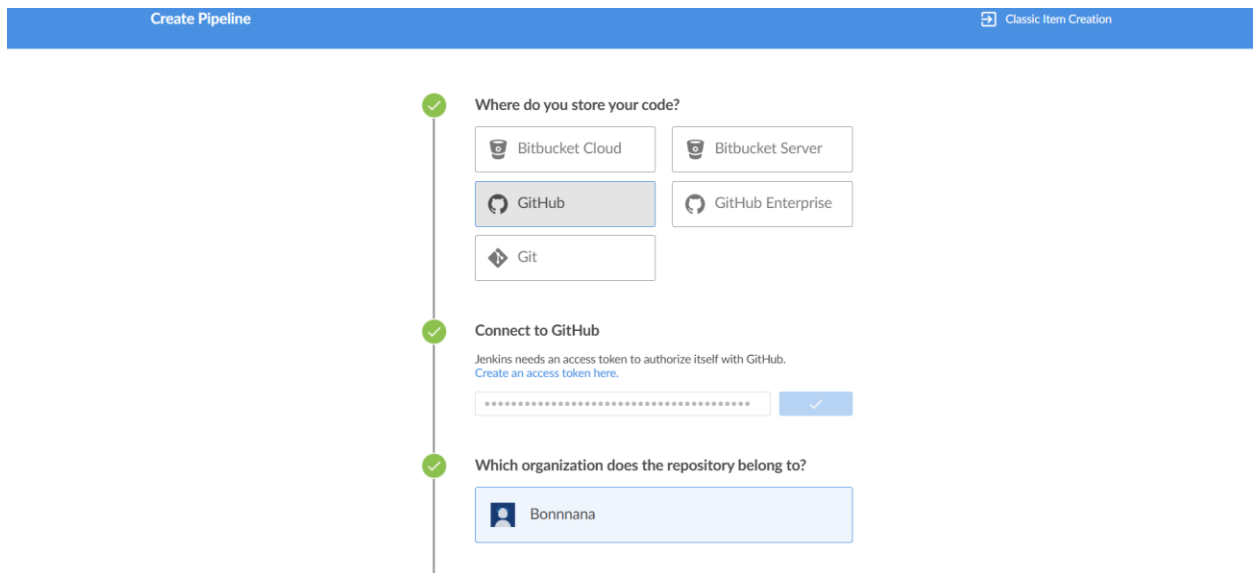
Branch: main   ⊘ 29s   No changes
Commit: 81d0c5a   🕐 a few seconds ago   Replayed #4

Start   Clone repository   Build image   **Push image**   End

Push image - 14s   ↻ Restart Push image

✓	> Checks if running on a Unix-like node	<1s
✓	> docker tag "$JD_ID" "$JD_TAGGED_IMAGE_NAME" — Shell Script	<1s
✓	> Checks if running on a Unix-like node	<1s
✓	> docker push "$JD_TAGGED_IMAGE_NAME" — Shell Script	4s
✓	> Checks if running on a Unix-like node	<1s
✓	> docker tag "$JD_ID" "$JD_TAGGED_IMAGE_NAME" — Shell Script	<1s
✓	> Checks if running on a Unix-like node	<1s
✓	> docker push "$JD_TAGGED_IMAGE_NAME" — Shell Script	4s

---

dockerhub   Explore   **My Hub**   🔍 Search Docker Hub

bojanaandonova
Docker Personal

⚙ **Repositories**
⚙ **Settings**
    Default privacy
    Notifications
🗄 **Billing**
📊 **Usage**
    Pulls
    Storage

bojanaandonova/kiii-jenkins 🔗
Last pushed about 1 hour ago

Add a description ✏ ⓘ
Add a category ✏ ⓘ

General   Tags   Image Management BETA   Collaborators   Webhooks   Settings

Tags

This repository contains 5 tag(s).

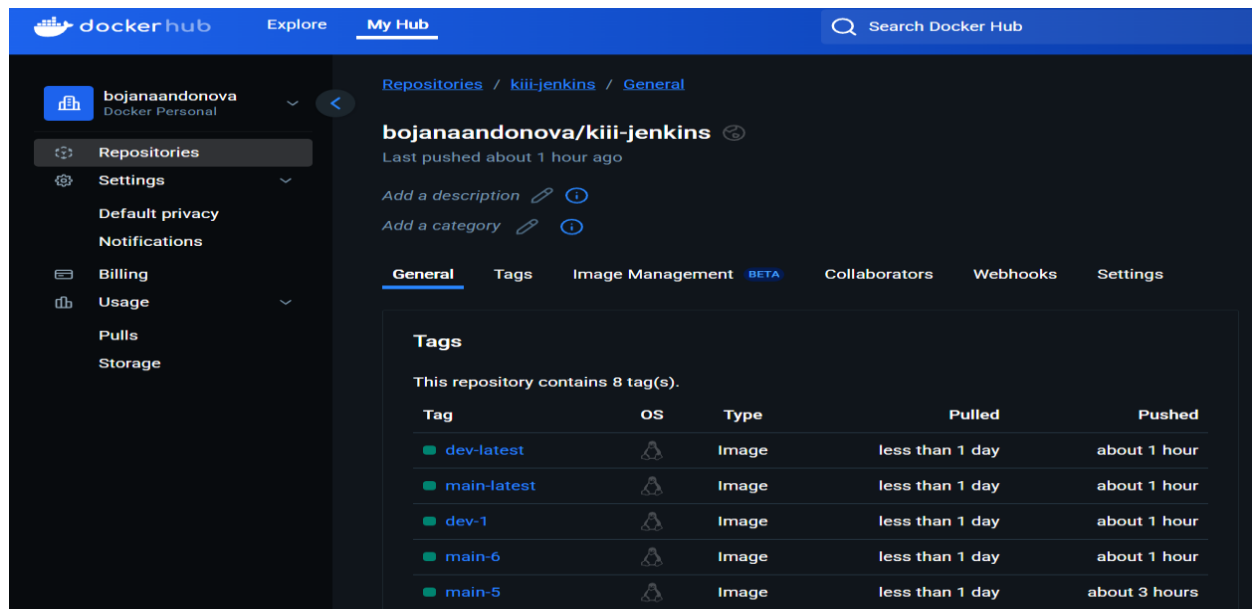| Tag	OS	Type	Pulled	Pushed
main-latest	🐧	Image	less than 1 day	about 1 hour
main-5	🐧	Image	less than 1 day	about 1 hour
main-3	🐧	Image	less than 1 day	about 1 hour
main-2	🐧	Image	less than 1 day	about 1 hour
main-1	🐧	Image	less than 1 day	about 1 hour

Create a Webhook in the GitHub repository
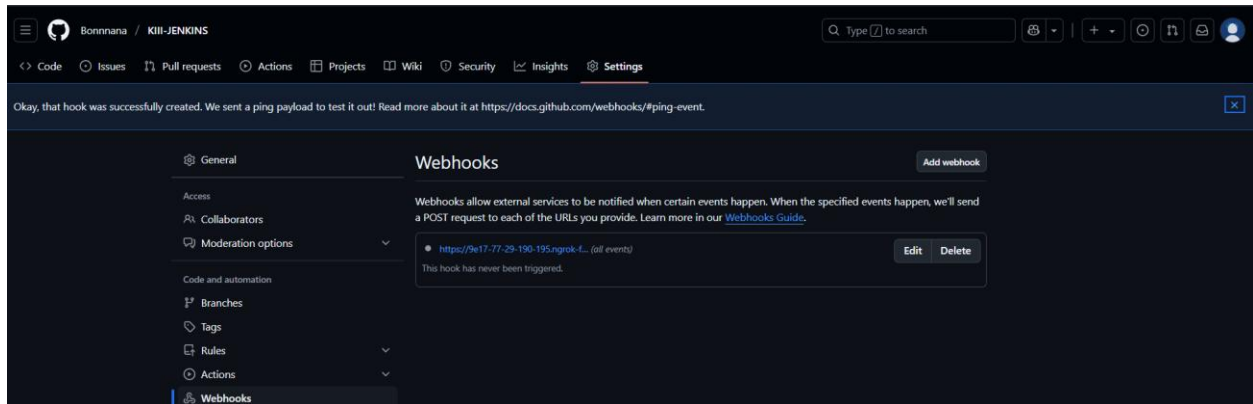
Create a new 'dev' branch in the repo. Make a change in it. Create a pull request from 'dev' to 'main'. Accept the PR and merge the changes.
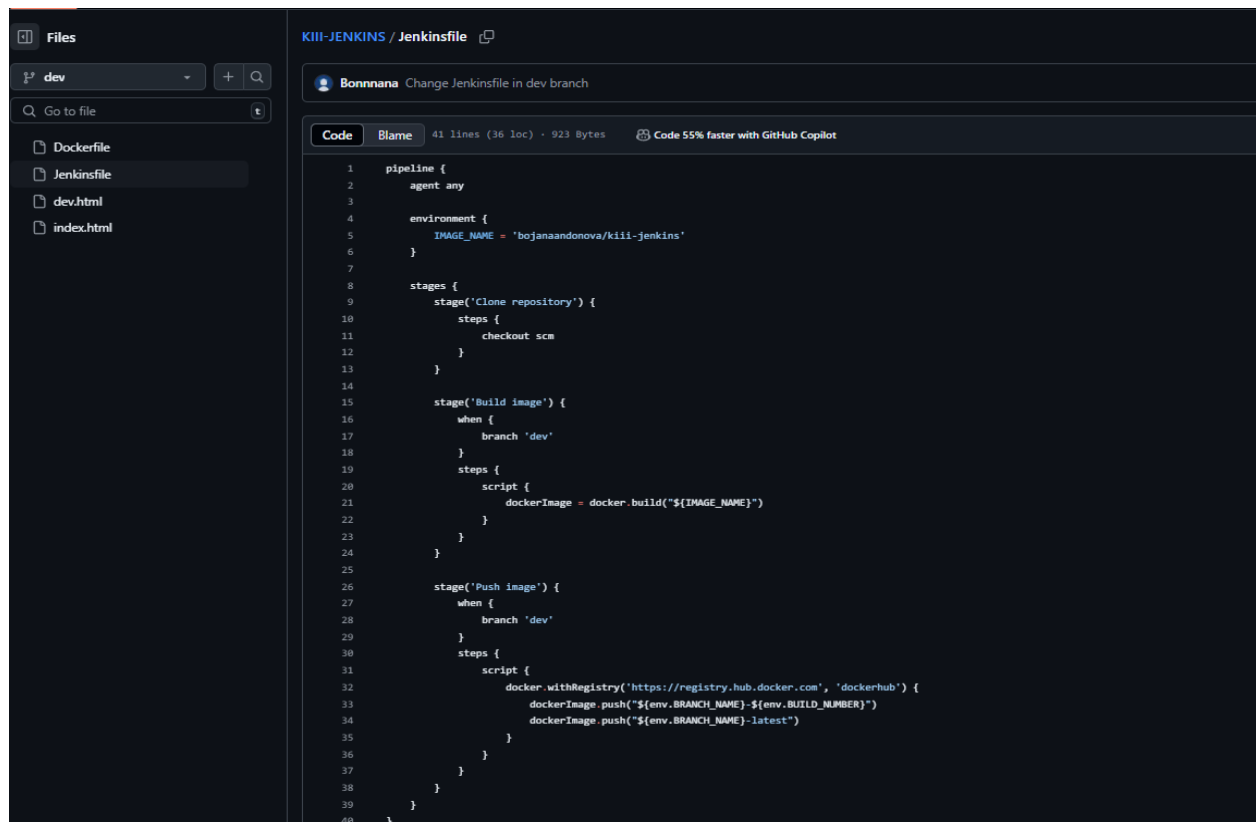
Part 4 (bonus): Branch-specific Pipeline in Blue Ocean

Modify the Pipeline from Part 3, so that the Docker Image build and push to Docker Hub will only happen if the changes are on the 'dev' branch.


```
pipeline {
    agent any

    environment {
        IMAGE_NAME = 'bojanaandonova/kiii-jenkins'
    }

    stages {
        stage('Clone repository') {
            steps {
                checkout scm
            }
        }

        stage('Build image') {
            when {
                branch 'dev'
            }
            steps {
                script {
                    dockerImage = docker.build("${IMAGE_NAME}")
                }
            }
        }

        stage('Push image') {
            when {
                branch 'dev'
            }
            steps {
                script {
                    docker.withRegistry('https://registry.hub.docker.com', 'dockerhub') {
                        dockerImage.push("${env.BRANCH_NAME}-${env.BUILD_NUMBER}")
                        dockerImage.push("${env.BRANCH_NAME}-latest")
                    }
                }
            }
        }
    }
}
```

| ✅ | 7 | 271c340 | main | Change Jenkinsfile in dev branch | 17s | a few seconds ag | ↺ |
| ✅ | 2 | 37aee5c | dev | Change Jenkinsfile in dev branch | 36s | a few seconds ag | ↺ |

Make changes to the 'dev' branch. What happens in Jenkins?

STATUS	RUN	COMMIT	BRANCH	MESSAGE	DURATION	COMPLETED
✅	3	3b1de3a	dev	Add file on dev branch	30s	2 minutes ago ↺

The changes are shown for the dev branch. Docker Image is built and pushed to the Dockerhub.

Make changes to the 'main' branch. What happens in Jenkins?

KIII-Exercise-02 ☆ ⚙

Activity   Branches   Pull Requests

STATUS	RUN	COMMIT	BRANCH	MESSAGE	DURATION	COMPLETED	
✓	3	3b1de3a	dev	Add file on dev branch	30s	13 minutes ago	↺
✓	2	37aee5c	dev	Change Jenkinsfile in dev branch	36s	16 minutes ago	↺
✓	7	271c340	main	Change Jenkinsfile in dev branch	17s	17 minutes ago	↺
✓	1	e005749	dev	Branch indexing	35s	2 hours ago	↺
✓	6	935cb71	main	Add dev branch	35s	2 hours ago	↺
✓	5	81d0c5a	main	Replayed #4	29s	3 hours ago	↺
✗	4	81d0c5a	main	Restarted from build #3, stage Push image	12s	3 hours ago	↺
✓	3	81d0c5a	main	Replayed #2	30s	3 hours ago	↺

✦ New   Introducing our new CEO Don Johnson - Read More →

docker hub   Explore   My Hub   🔍 Search Docker Hub

bojanaandonova
Docker Personal

Repositories
Settings
  Default privacy
  Notifications
Billing
Usage
Pulls
Storage

Repositories / kiii-jenkins / General

bojanaandonova/kiii-jenkins 🌐
Last pushed 13 minutes ago

Add a description ✏ ⓘ
Add a category ✏ ⓘ

General   Tags   Image Management BETA   Collaborators   Webhooks   Settings

Tags

This repository contains 10 tag(s).

Tag	OS	Type	Pulled	Pushed
● dev-latest	🐧	Image	less than 1 day	13 minutes
● dev-3	🐧	Image	less than 1 day	13 minutes
● dev-2	🐧	Image	less than 1 day	17 minutes

Making changes on the main branch does not trigger a Docker image build or push. No updates appear in Jenkins or Docker Hub.