Cairo University
Faculty of Computers and Artificial Intelligence

SLB423-Selected Labs in Software Engineering: Project
Phase - 4

Delivered To: TA.Khaled Ibrahim

Prepared By:

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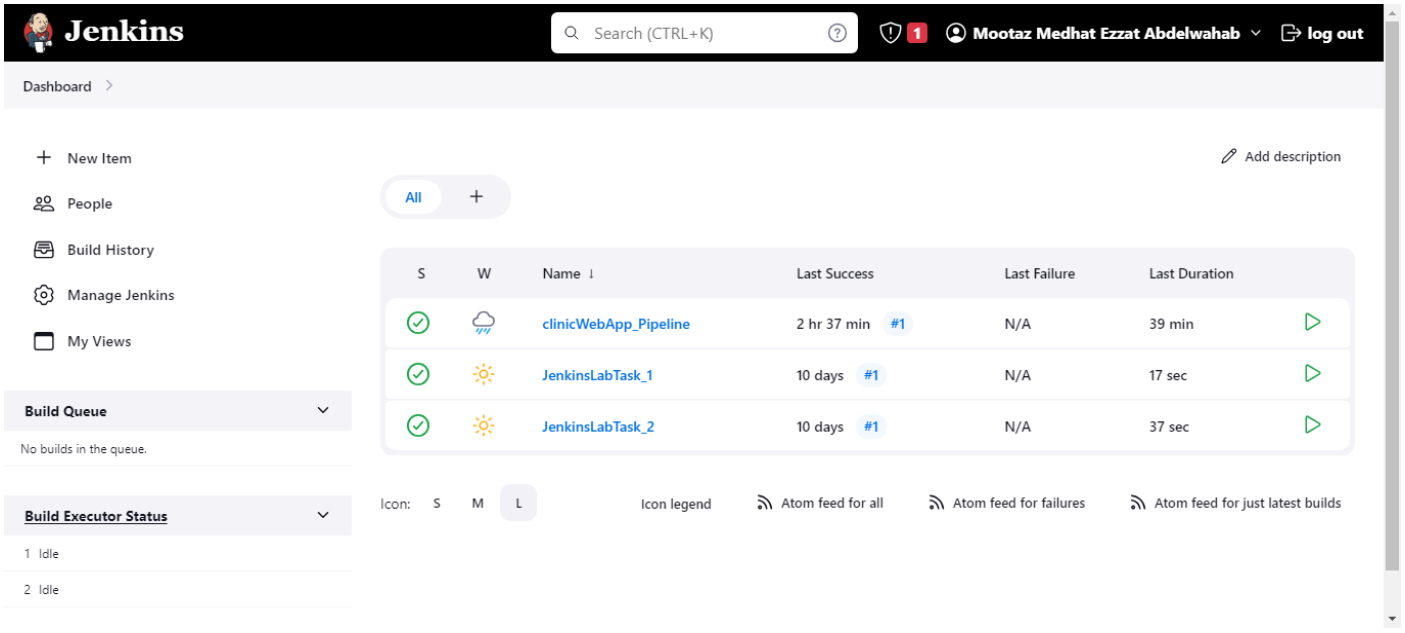
First Semester

SLB423-Selected Labs in Software Engineering **[Project - Phase 4]**

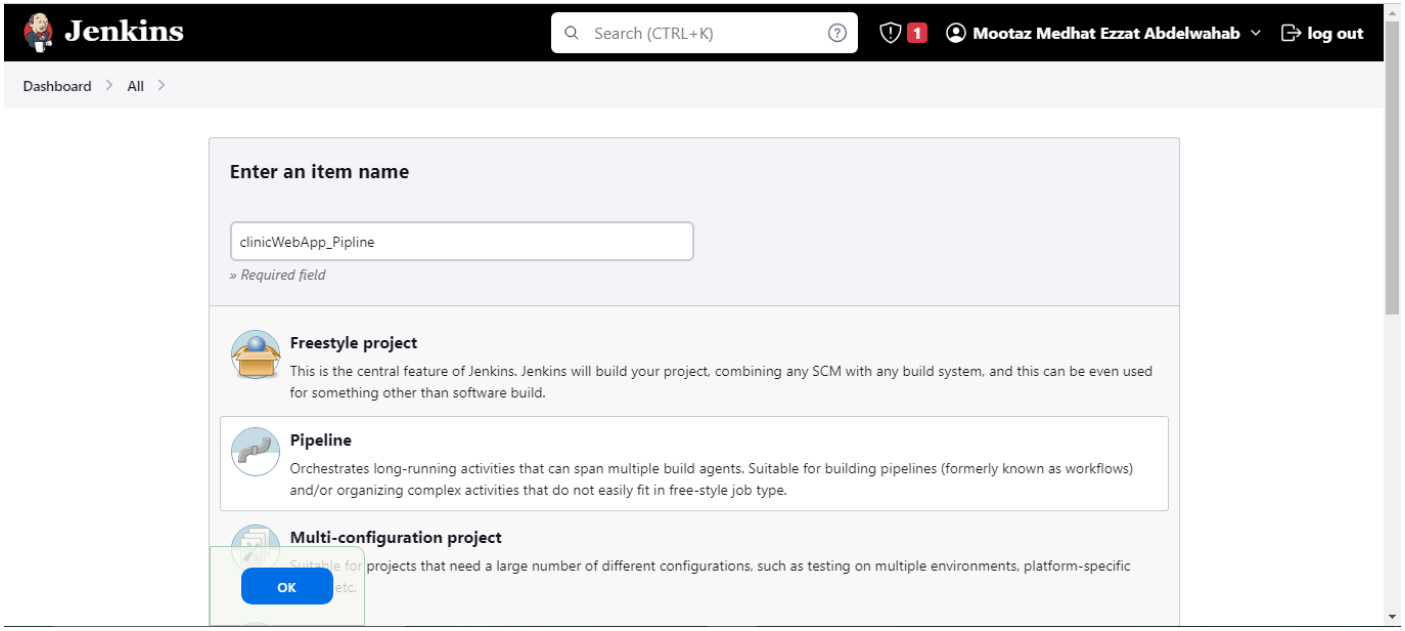
➢ CONTENT:

- **➢ Creating pipeline for backend and frontend layer using jenkins.**
- **➢ Doing performance testing using Jmeter and creating report for it after deploying on openshift.**

➢ Creating pipeline for backend and frontend layer using jenkins

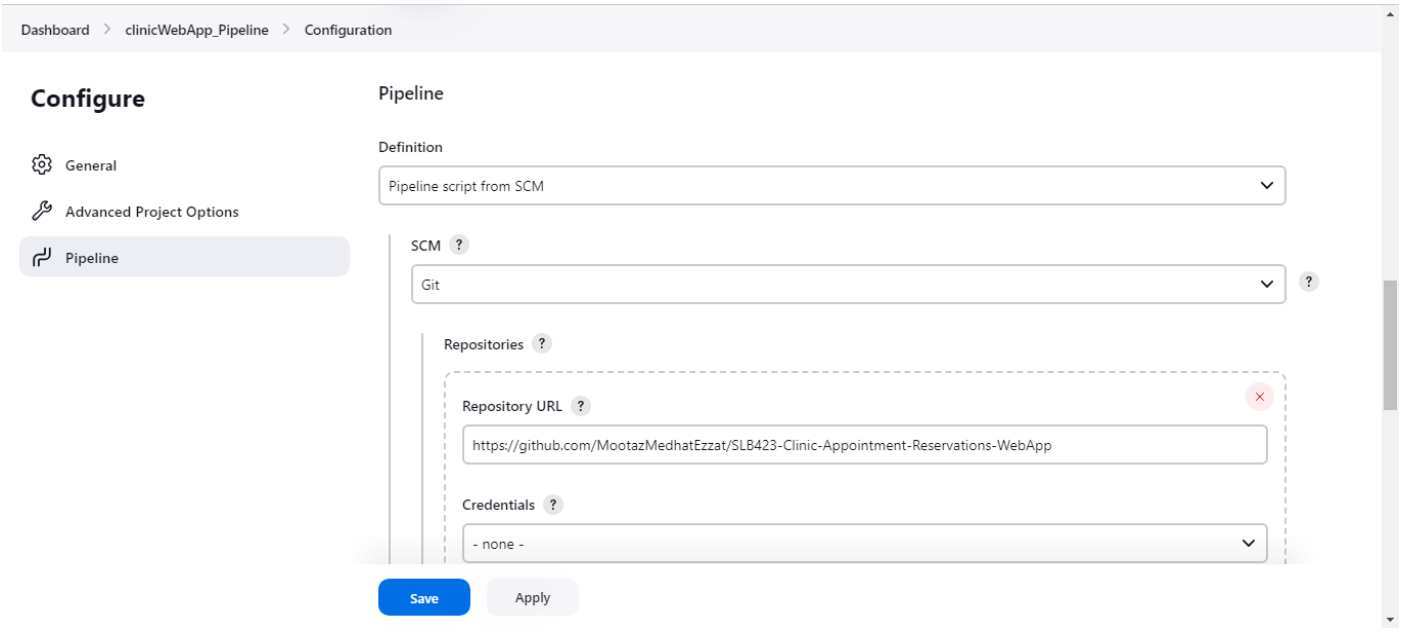


- **Create a new pipeline item on jenkins**



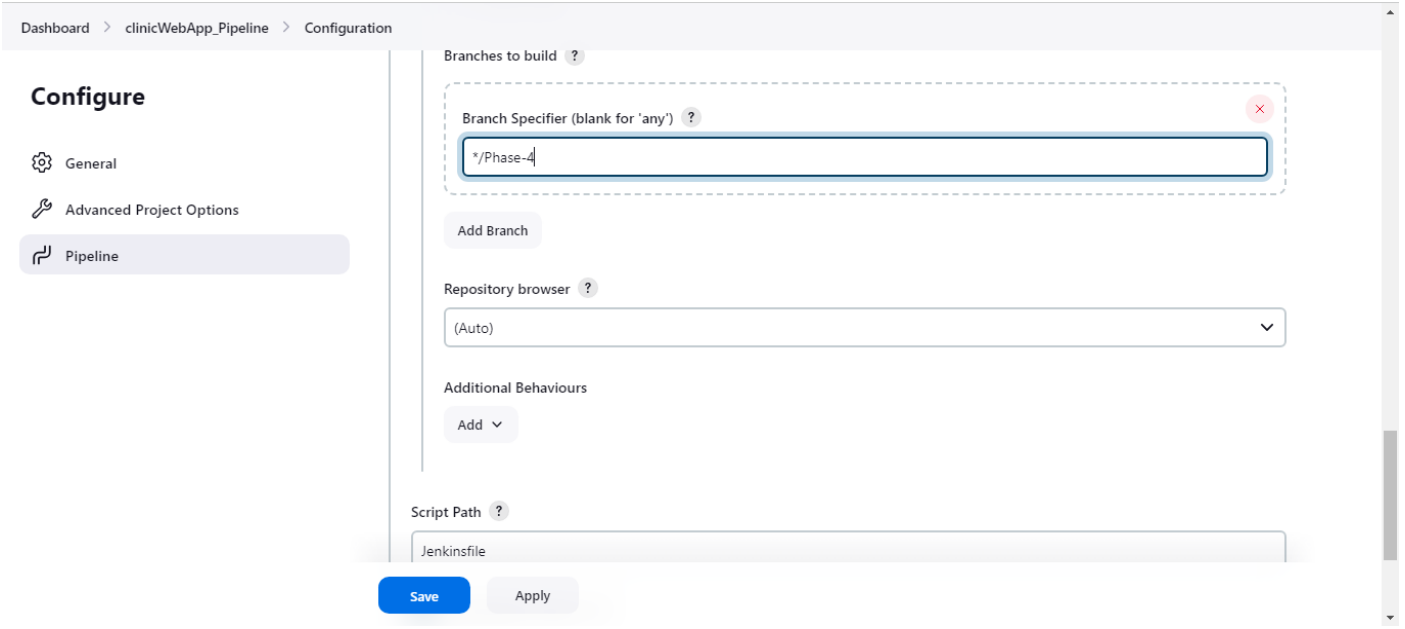
In the Pipeline section, you can either write a pipeline script directly or link to a repository. Since i have pushed the script to a repository, i will choose "Pipeline script from SCM" and select the version control system (in our case, Git).

• Set the Repository URL.



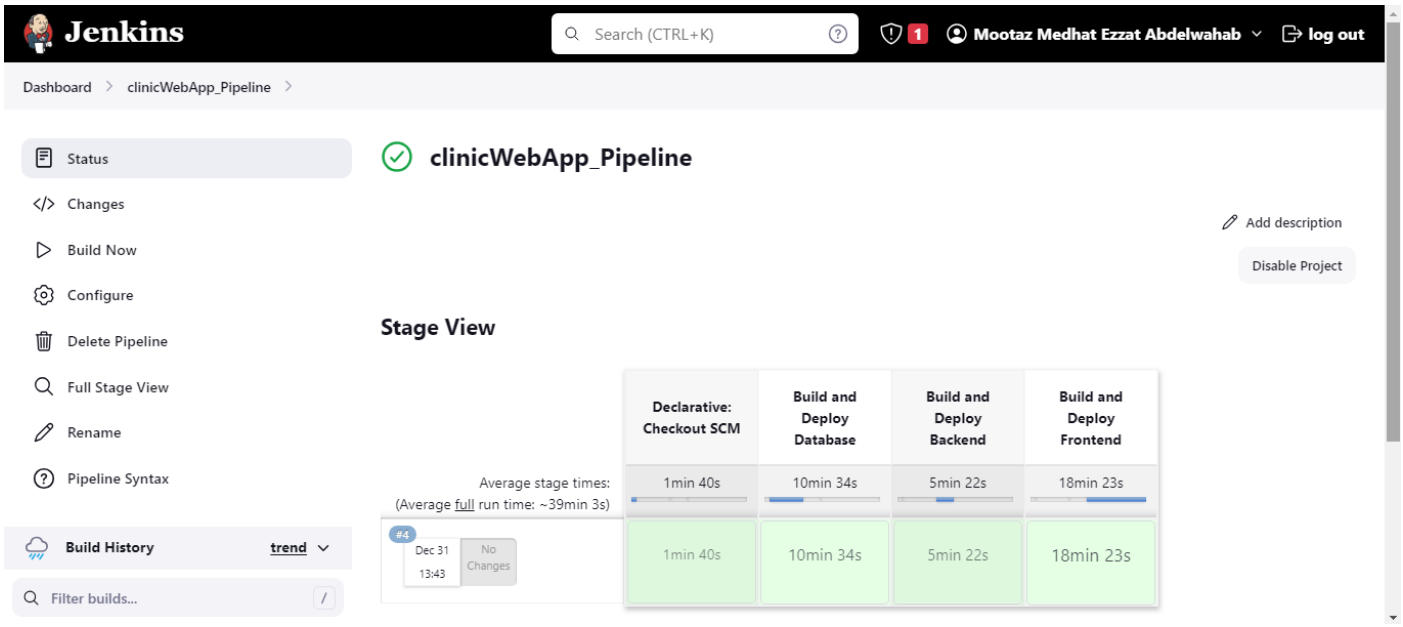
Specify the branch (in our case, Phase-4).

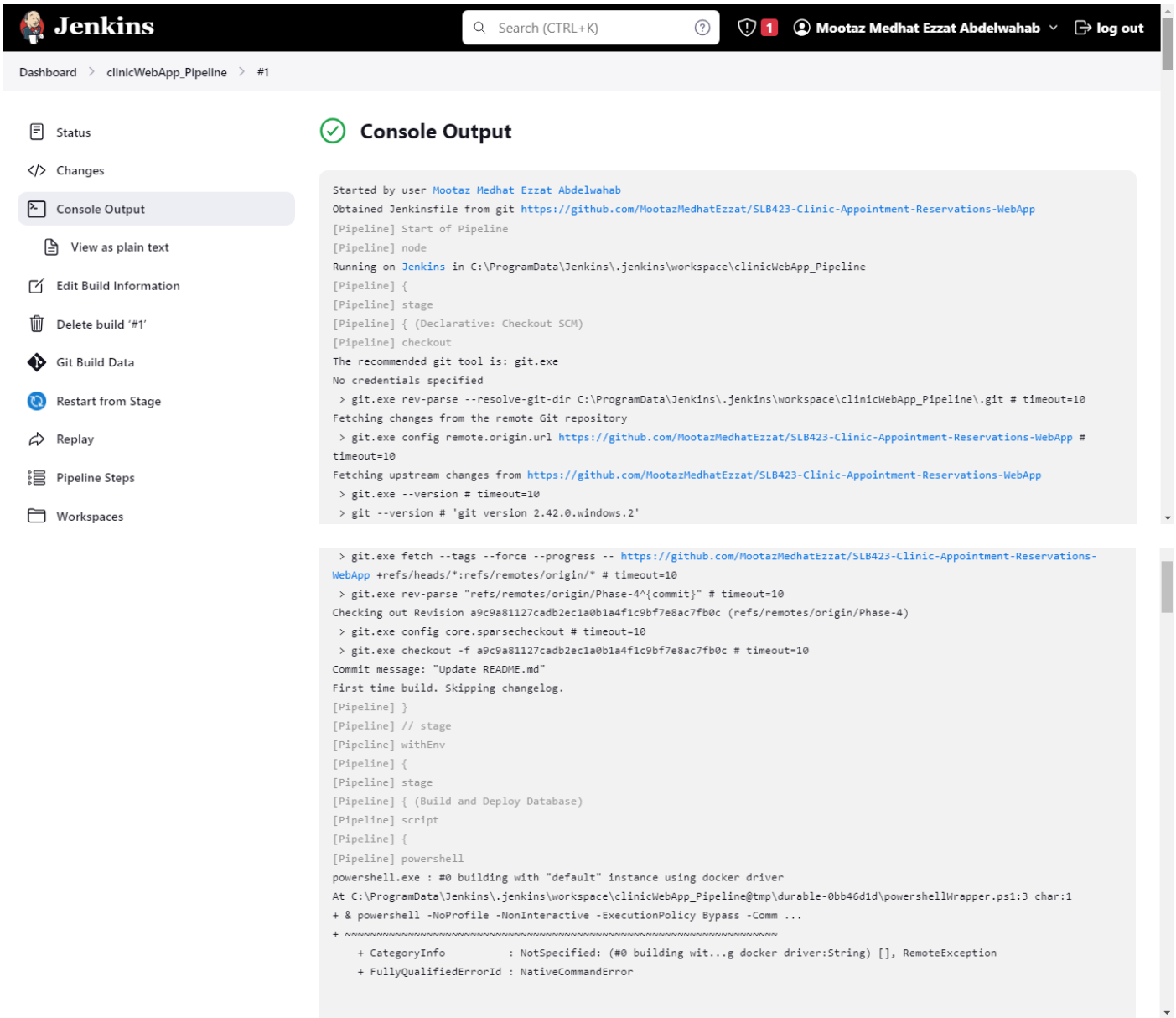
• Set the Script Path to Jenkinsfile.



• Create a CI/CD for this by configuring jenkins to pull the repo and execute the bash In your Git repository, create a file named Jenkinsfile that will include the pipeline script.

Now, Jenkins will automatically pull the repository, execute the Bash script, and display the results in the console output.


Jenkins
Search (CTRL+K)
1
Mootaz Medhat Ezzat Abdelwahab
log out
Dashboard
clinicWebApp_Pipeline
Status
Changes
Build Now
Configure
Delete Pipeline
Full Stage View
Rename
Pipeline Syntax
Build History
trend
Filter builds...
clinicWebApp_Pipeline
Add description
Disable Project
Stage View
Declarative: Checkout SCM
Build and Deploy Database
Build and Deploy Backend
Build and Deploy Frontend
Average stage times:
(Average full run time: ~39min 3s)
1min 40s
10min 34s
5min 22s
18min 23s
#4
Dec 31
13:43
No Changes


Jenkins
Search (CTRL+K)
1
Mootaz Medhat Ezzat Abdelwahab
log out
Dashboard
clinicWebApp_Pipeline
#1
Status
Changes
Console Output
View as plain text
Edit Build Information
Delete build '#1'
Git Build Data
Restart from Stage
Replay
Pipeline Steps
Workspaces
Console Output
Started by user Mootaz Medhat Ezzat Abdelwahab
Obtained Jenkinsfile from git https://github.com/MootazMedhatEzzat/SLB423-Clinic-Appointment-Reservations-WebApp
[Pipeline] Start of Pipeline
[Pipeline] node
Running on Jenkins in C:\ProgramData\Jenkins\.jenkins\workspace\clinicWebApp_Pipeline
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Declarative: Checkout SCM)
[Pipeline] checkout
The recommended git tool is: git.exe
No credentials specified
> git.exe rev-parse --resolve-git-dir C:\ProgramData\Jenkins\.jenkins\workspace\clinicWebApp_Pipeline\.git # timeout=10
Fetching changes from the remote Git repository
> git.exe config remote.origin.url https://github.com/MootazMedhatEzzat/SLB423-Clinic-Appointment-Reservations-WebApp # timeout=10
Fetching upstream changes from https://github.com/MootazMedhatEzzat/SLB423-Clinic-Appointment-Reservations-WebApp
> git.exe --version # timeout=10
> git --version # 'git version 2.42.0.windows.2'

> git.exe fetch --tags --force --progress -- https://github.com/MootazMedhatEzzat/SLB423-Clinic-Appointment-Reservations-WebApp +refs/heads/*:refs/remotes/origin/* # timeout=10
> git.exe rev-parse "refs/remotes/origin/Phase-4^{commit}" # timeout=10
Checking out Revision a9c9a81127cadb2ec1a0b1a4f1c9bf7e8ac7fb0c (refs/remotes/origin/Phase-4)
> git.exe config core.sparsecheckout # timeout=10
> git.exe checkout -f a9c9a81127cadb2ec1a0b1a4f1c9bf7e8ac7fb0c # timeout=10
Commit message: "Update README.md"
First time build. Skipping changelog.
[Pipeline] }
[Pipeline] // stage
[Pipeline] withEnv
[Pipeline] {
[Pipeline] stage
[Pipeline] { (Build and Deploy Database)
[Pipeline] script
[Pipeline] {
[Pipeline] powershell
powershell.exe : #0 building with "default" instance using docker driver
At C:\ProgramData\Jenkins\.jenkins\workspace\clinicWebApp_Pipeline@tmp\durable-0bb46d1d\powershellWrapper.ps1:3 char:1
+ & powershell -NoProfile -NonInteractive -ExecutionPolicy Bypass -Comm ...
+ ~~~~~~
+ CategoryInfo : NotSpecified: (#0 building wit...g docker driver:String) [], RemoteException
+ FullyQualifiedErrorId : NativeCommandError

```
#1 [internal] load .dockerignore
#1 DONE 0.9s

#2 [internal] load build definition from Dockerfile
#2 DONE 0.9s

#2 [internal] load build definition from Dockerfile
#2 transferring dockerfile:
#2 transferring dockerfile: 950B 2.6s done
#2 ...

#1 [internal] load .dockerignore
#1 transferring context: 2B 1.6s done
#1 DONE 7.1s

#2 [internal] load build definition from Dockerfile
#2 DONE 9.6s

#3 [internal] load metadata for docker.io/library/postgres:16-alpine3.18
#3 DONE 39.3s

#4 [internal] load build context
#4 DONE 0.0s
```

```
#5 [1/3] FROM docker.io/library/postgres:16-
alpine3.18@sha256:4561d264394acf3374588df017c33cc3c7d88f68d6fdc5022efa54167ce20638
#5 DONE 1.0s

#4 [internal] load build context
#4 transferring context: 28B 0.0s
#4 transferring context: 30B 0.2s done
#4 DONE 2.4s

#6 [2/3] COPY init.sql /docker-entrypoint-initdb.d/
#6 CACHED

#7 [3/3] RUN mkdir -p /var/lib/postgresql/data/custom-data && chown -R postgres:postgres /var/lib/postgresql/data/custom-data
#7 CACHED

#8 exporting to image
#8 exporting layers
#8 exporting layers 0.1s done
#8 writing image sha256:b5e1930cc1f0ba4625d7cf7f3e5581a90776b85ed74ed47983b801b85ffd3bf5
#8 writing image sha256:b5e1930cc1f0ba4625d7cf7f3e5581a90776b85ed74ed47983b801b85ffd3bf5 0.8s done
#8 naming to docker.io/library/clinic-web-database-image
#8 naming to docker.io/library/clinic-web-database-image 2.2s done
#8 DONE 3.1s

What's Next?
```

```
  View a summary of image vulnerabilities and recommendations â†’ docker scout quickview
075fc58ebeb50b60253161ae1f8bd5aa07012639334c8f8843164023330a7fb8
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Build and Deploy Backend)
[Pipeline] script
[Pipeline] {
[Pipeline] powershell
powershell.exe : #0 building with "default" instance using docker driver
At C:\ProgramData\Jenkins\.jenkins\workspace\clinicWebApp_Pipeline@tmp\durable-d5a04583\powershellWrapper.ps1:3 char:1
+ & powershell -NoProfile -NonInteractive -ExecutionPolicy Bypass -Comm ...
+ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    + CategoryInfo          : NotSpecified: (#0 building wit...g docker driver:String) [], RemoteException
    + FullyQualifiedErrorId : NativeCommandError


#1 [internal] load .dockerignore
#1 transferring context:
#1 transferring context: 2B 1.5s done
#1 ...
```

```
#2 [internal] load build definition from Dockerfile
#2 transferring dockerfile: 764B 2.8s done
#2 DONE 6.0s

#1 [internal] load .dockerignore
#1 DONE 7.0s

#3 [internal] load metadata for docker.io/library/node:20.9.0-alpine3.18
#3 DONE 12.4s

#4 [1/7] FROM docker.io/library/node:20.9.0-
alpine3.18@sha256:cb2301e2c5fe3165ba2616591efe53b4b6223849ac0871c138f56d5f7ae8be4b
#4 DONE 0.0s

#5 [internal] load build context
#5 transferring context:
#5 transferring context: 1.04kB 6.3s
#5 transferring context: 79.69kB 8.2s done
#5 DONE 9.8s

#6 [3/7] COPY package*.json ./
#6 CACHED

#7 [4/7] RUN npm install
#7 CACHED
```

```
#8 [5/7] COPY src ./src
#8 CACHED

#9 [6/7] COPY database.js ./
#9 CACHED

#10 [2/7] WORKDIR /clinicWebApp/server
#10 CACHED

#11 [7/7] COPY server.js ./
#11 CACHED

#12 exporting to image
#12 exporting layers done
#12 writing image sha256:4e2de9c35ec26b08ecc4032f7a867b25a37bfec0fa568b42578a4d411a4f03b9
#12 writing image sha256:4e2de9c35ec26b08ecc4032f7a867b25a37bfec0fa568b42578a4d411a4f03b9 0.5s done
#12 naming to docker.io/library/clinic-web-server
#12 naming to docker.io/library/clinic-web-server 3.8s done
#12 DONE 4.3s
```

```
What's Next?
  View a summary of image vulnerabilities and recommendations â†’ docker scout quickview
1239dbae78310d6ff89c763c5c1e561b774159f038d6ff3681a15307243a189a
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] stage
[Pipeline] { (Build and Deploy Frontend)
[Pipeline] script
[Pipeline] {
[Pipeline] powershell
powershell.exe : #0 building with "default" instance using docker driver
At C:\ProgramData\Jenkins\.jenkins\workspace\clinicWebApp_Pipeline@tmp\durable-fcc3eca1\powershellWrapper.ps1:3 char:1
+ & powershell -NoProfile -NonInteractive -ExecutionPolicy Bypass -Comm ...
+ ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    + CategoryInfo          : NotSpecified: (#0 building wit...g docker driver:String) [], RemoteException
    + FullyQualifiedErrorId : NativeCommandError


#1 [internal] load build definition from Dockerfile
#1 transferring dockerfile:
#1 transferring dockerfile: 955B 4.8s done
#1 ...
```

```
#2 [internal] load .dockerignore
#2 transferring context: 2B 2.5s done
#2 DONE 9.5s

#1 [internal] load build definition from Dockerfile
#1 DONE 12.5s

#3 [internal] load metadata for docker.io/library/node:20.9.0-alpine3.18
#3 DONE 26.9s

#4 [1/8] FROM docker.io/library/node:20.9.0-
alpine3.18@sha256:cb2301e2c5fe3165ba2616591efe53b4b6223849ac0871c138f56d5f7ae8be4b
#4 DONE 0.0s

#5 [internal] load build context
#5 transferring context:
#5 transferring context: 38B 551.7s
#5 transferring context: 750.42kB 553.3s done
#5 DONE 556.2s

#6 [4/8] RUN npm install
#6 CACHED

#7 [5/8] COPY src ./src
#7 CACHED
```

```
#8 [6/8] COPY public ./public
#8 CACHED

#9 [7/8] COPY server.js ./
#9 CACHED

#10 [2/8] WORKDIR /clinicWebApp/client
#10 CACHED

#11 [3/8] COPY package*.json ./
#11 CACHED

#12 [8/8] RUN npm run build
#12 CACHED

#13 exporting to image
#13 exporting layers done
#13 writing image sha256:1dab3ad23d226a023ddb860a3400039e8c5808674a6f19ceb2be5dad0abc9462
#13 writing image sha256:1dab3ad23d226a023ddb860a3400039e8c5808674a6f19ceb2be5dad0abc9462 1.0s done
#13 naming to docker.io/library/clinic-web-client
#13 naming to docker.io/library/clinic-web-client 1.0s done
#13 DONE 2.0s
```

```
What's Next?
  View a summary of image vulnerabilities and recommendations â†’ docker scout quickview
a6829569a80fcfbc5d211af3db63a3f8adc7db793011b4ce9170c3e4f41da6f1
[Pipeline] }
[Pipeline] // script
[Pipeline] }
[Pipeline] // stage
[Pipeline] }
[Pipeline] // withEnv
[Pipeline] }
[Pipeline] // node
[Pipeline] End of Pipeline
Finished: SUCCESS
```

```
Command Prompt
Microsoft Windows [Version 10.0.19045.3570]
(c) Microsoft Corporation. All rights reserved.

C:\Users\MAS>docker network ls
NETWORK ID     NAME          DRIVER    SCOPE
b049acc24f81   api-network   bridge    local
d5269ce54eb2   bridge        bridge    local
9fc8e2bc35d0   host          host      local
6173b4465e6d   none          null      local
bc20406df762   ui-network    bridge    local

C:\Users\MAS>docker images
REPOSITORY                 TAG       IMAGE ID       CREATED         SIZE
clinic-web-client          latest    1dab3ad23d22   36 hours ago    422MB
clinic-web-database-image  latest    b5e1930cc1f0   41 hours ago    239MB
clinic-web-server          latest    4e2de9c35ec2   41 hours ago    146MB

C:\Users\MAS>docker ps
CONTAINER ID   IMAGE                       COMMAND                  CREATED             STATUS             PORTS                    NAMES
a6829569a80f   clinic-web-client:latest    "docker-entrypoint.s…"   48 minutes ago      Up 48 minutes      0.0.0.0:3001->3001/tcp   clinic-web-frontend
1239dbae7831   clinic-web-server:latest    "docker-entrypoint.s…"   About an hour ago   Up About an hour   0.0.0.0:3000->3000/tcp   clinic-web-backend
075fc58ebeb5   clinic-web-database-image   "docker-entrypoint.s…"   About an hour ago   Up 28 minutes      0.0.0.0:5432->5432/tcp   clinic-web-database-container
```

➢ Doing performance testing using Jmeter and creating report for it after deploying on openshift

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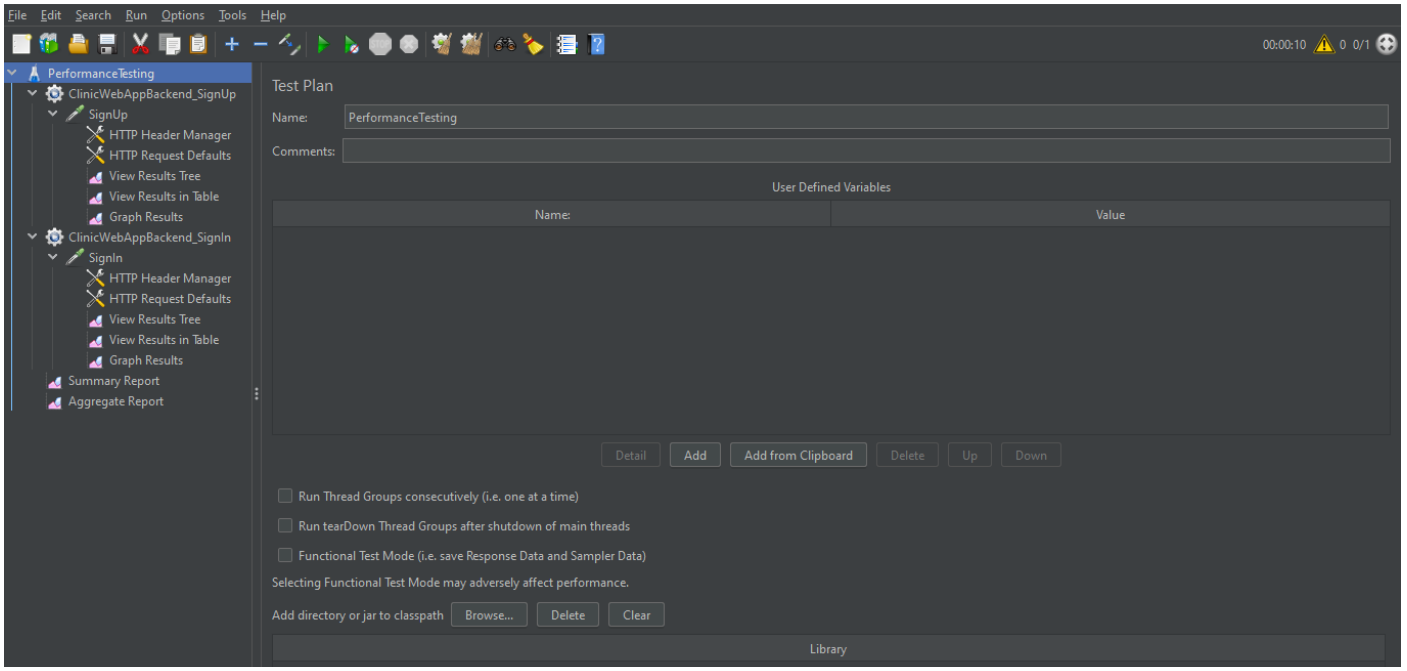
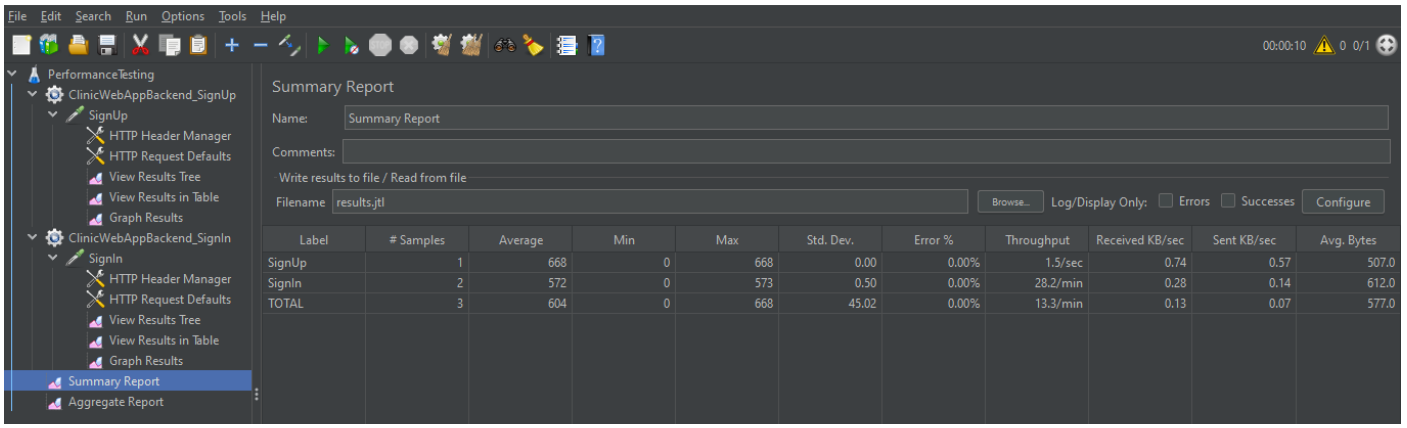
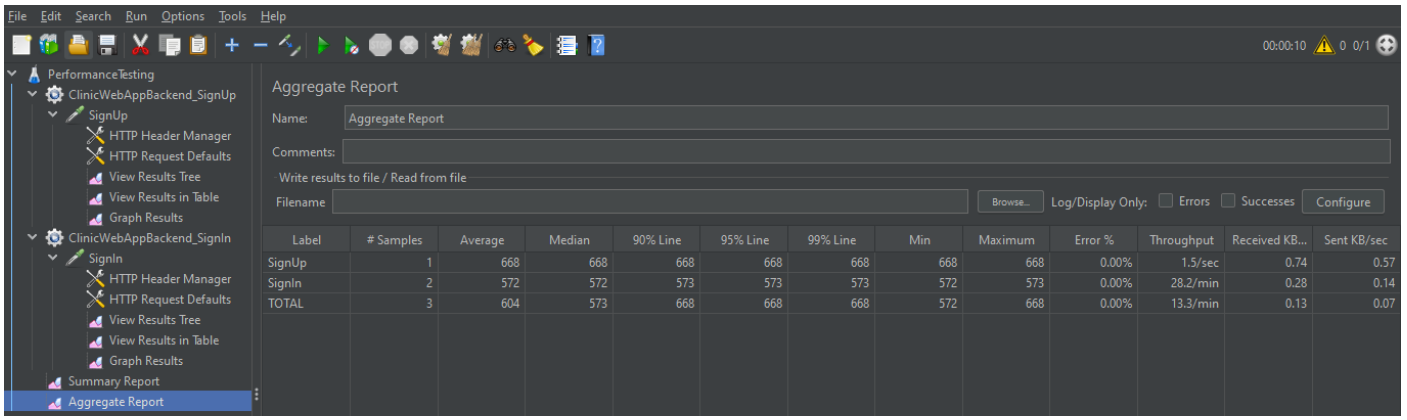


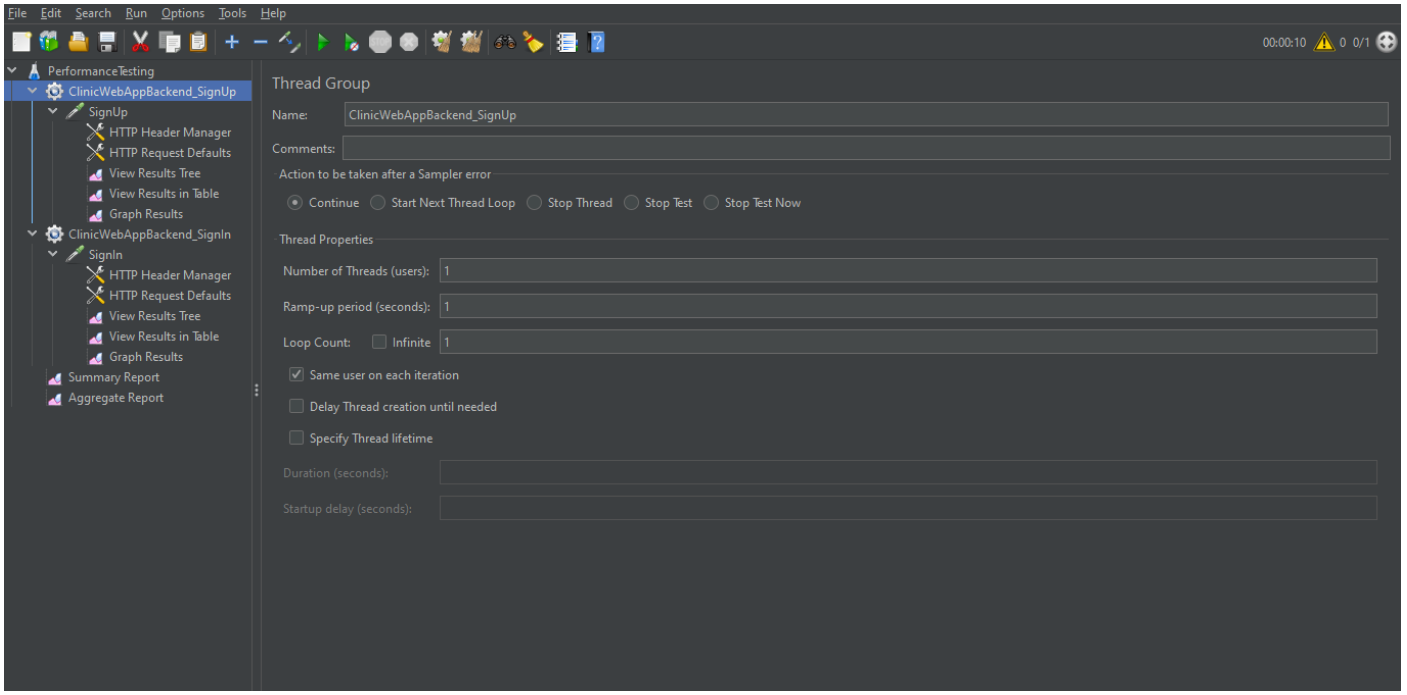
• Summary Report

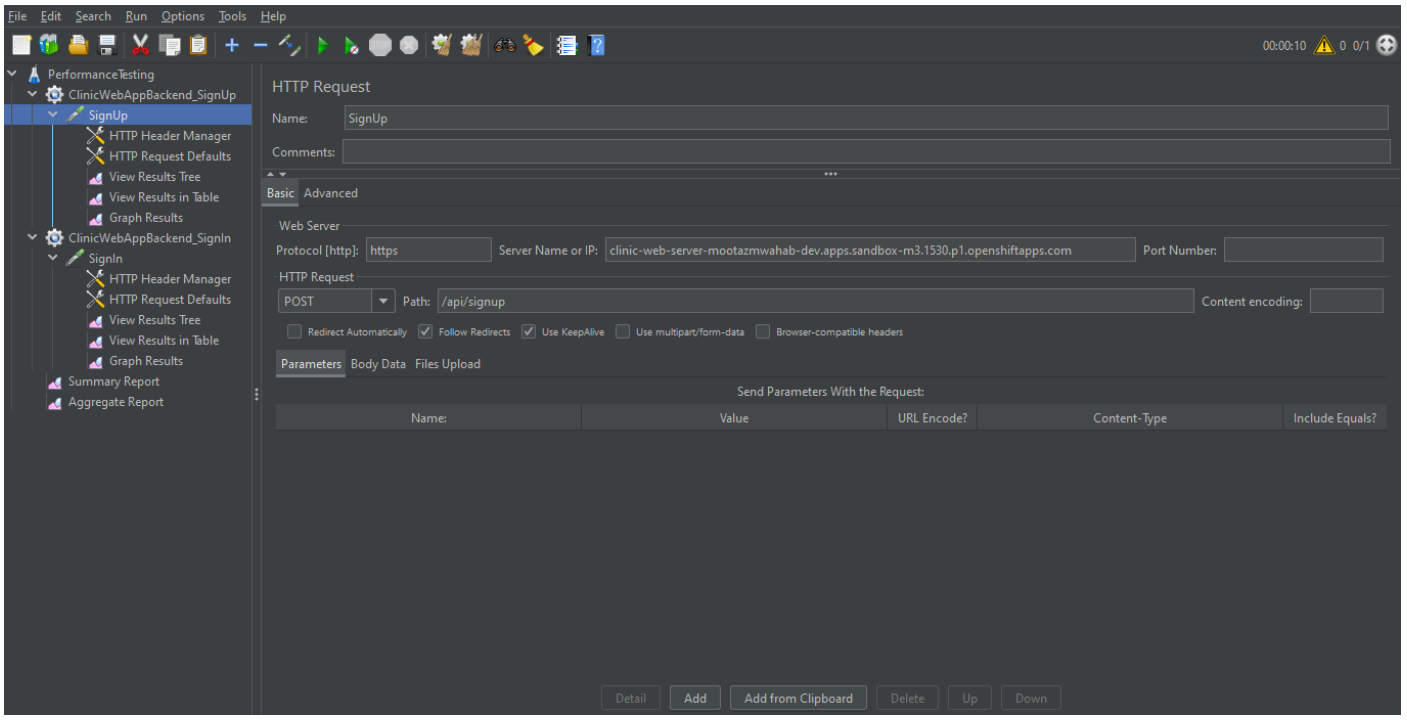


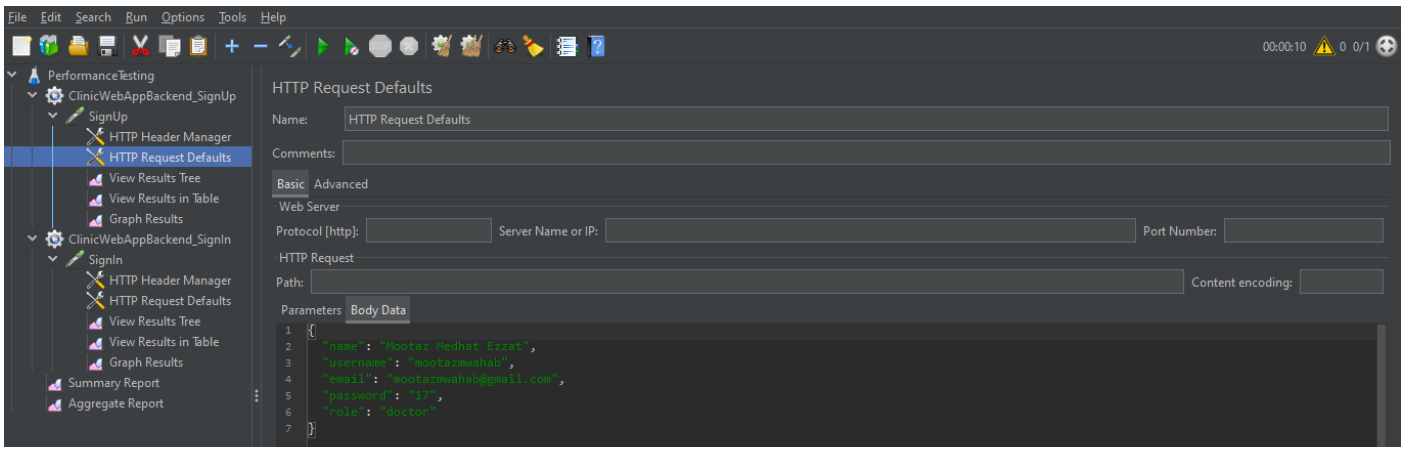
• Aggregate Report



- **ClinicWebAppBackend_SignUp**







- **ClinicWebAppBackend_SignIn**