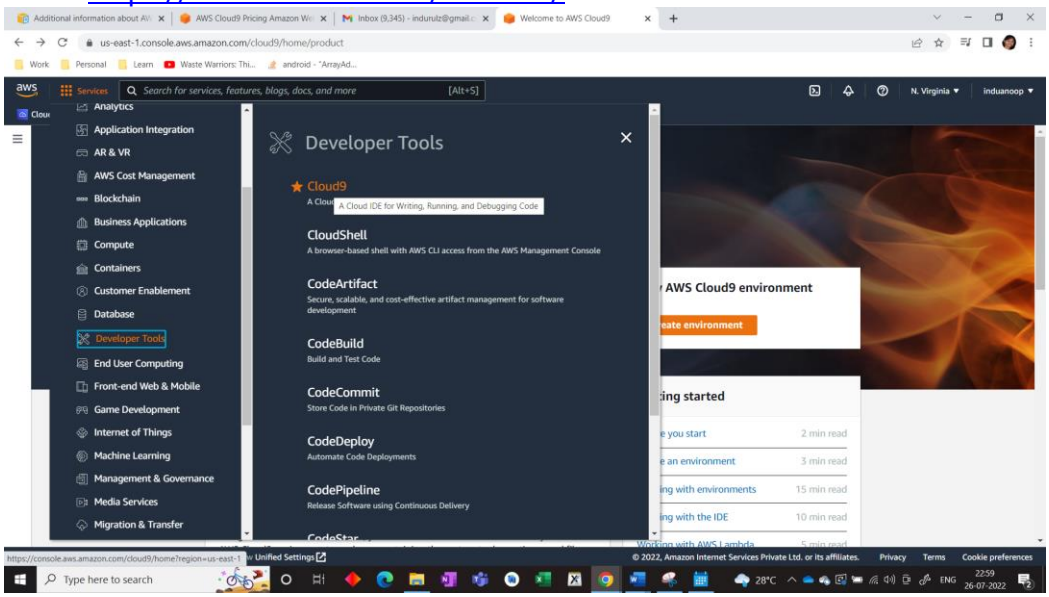
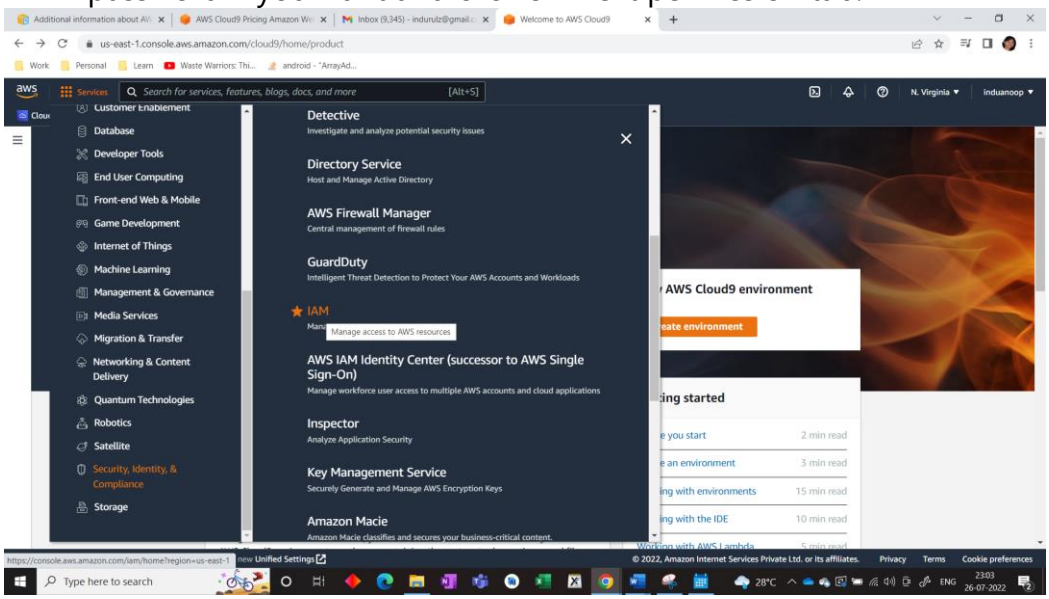
Semester	T.E. Semester V – Information Technology
Subject	Advance DevOps Lab
Subject Professor In-charge	Prof. Indu Anoop
Laboratory	

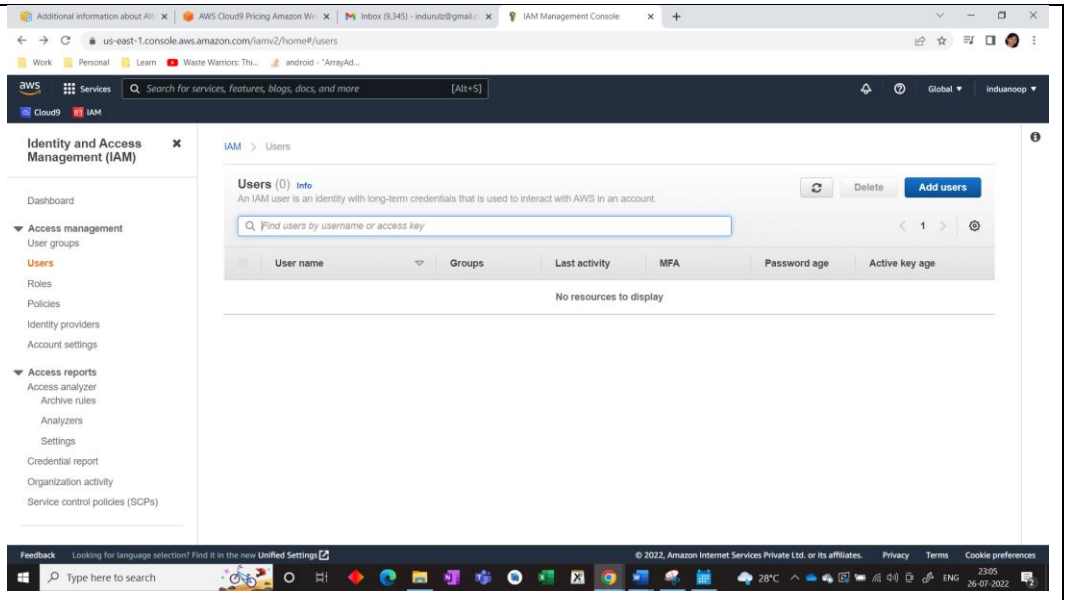
Student Name	Rahul Chougule	
Roll Number	20101A0055	
Grade and Subject Teacher's Signature		

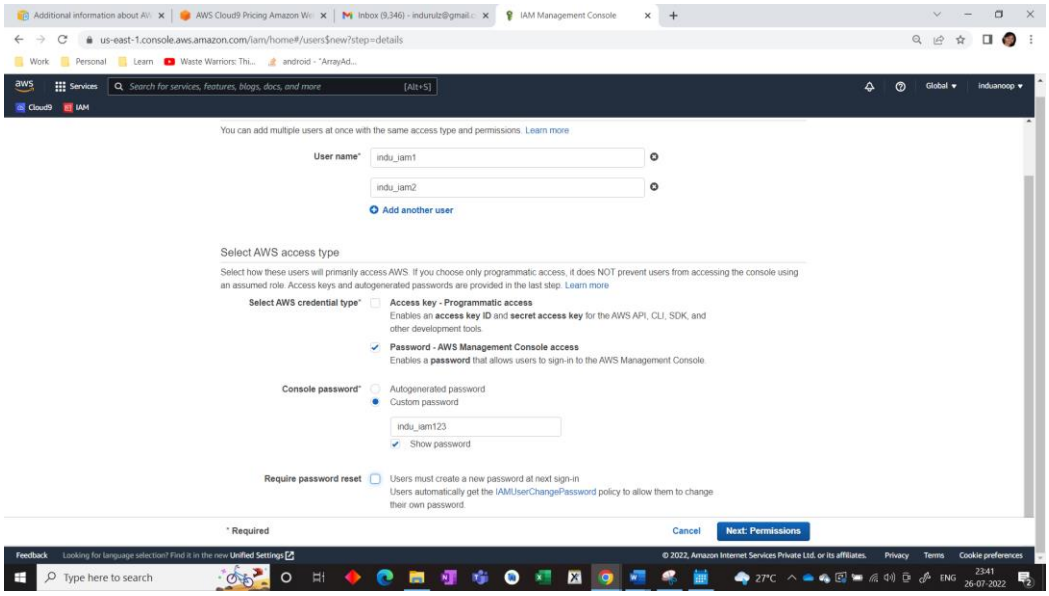
Experiment	1	
Problem Statement	To understand the benefits of Cloud Infrastructure and Setup AWS Cloud9 IDE, Launch AWS Cloud9 IDE, and Perform Collaboration Demonstration	
Resources / Apparatus Required	Hardware: Computer System	Software: Web Browser
Details	**Theory:** AWS Cloud9 is a cloud-based integrated development environment (IDE) that lets you write, run, and debug your code with just a browser. It includes a code editor, debugger, and terminal. Cloud9 comes pre-packaged with essential tools for popular programming languages, including JavaScript, Python, PHP, and more, so you don't need to install files or configure your development machine to start new projects. Since your Cloud9 IDE is cloud-based, you can work on your projects from your office, home, or anywhere using an internet-connected machine. Cloud9 also provides a seamless experience for developing serverless applications enabling you to easily define resources, debug, and switch between local and remote execution of serverless applications. With Cloud9, you can quickly share your development environment with your team, enabling you to pair program and track each other's inputs in real time. **Benefits:** **CODE WITH JUST A BROWSER** AWS Cloud9 gives you the flexibility to run your development environment on a managed Amazon EC2 instance or any existing Linux server that	

	supports SSH. This means that you can write, run, and debug applications with just a browser, without needing to install or maintain a local IDE. The Cloud9 code editor and integrated debugger include helpful, time-saving features such as code hinting, code completion, and step-through debugging. The Cloud9 terminal provides a browser-based shell experience enabling you to install additional software, do a git push, or enter commands. **CODE TOGETHER IN REAL TIME** AWS Cloud9 makes collaborating on code easy. You can share your development environment with your team in just a few clicks and pair program together. While collaborating, your team members can see each other type in real time, and instantly chat with one another from within the IDE. **BUILD SERVERLESS APPLICATIONS WITH EASE** AWS Cloud9 makes it easy to write, run, and debug serverless applications. It preconfigures the development environment with all the SDKs, libraries, and plug-ins needed for serverless development. Cloud9 also provides an environment for locally testing and debugging AWS Lambda functions. This allows you to iterate on your code directly, saving you time and improving the quality of your code. **DIRECT TERMINAL ACCESS TO AWS** AWS Cloud9 comes with a terminal that includes sudo privileges to the managed Amazon EC2 instance that is hosting your development environment and a pre-authenticated AWS Command Line Interface. This makes it easy for you to quickly run commands and directly access AWS services **START NEW PROJECTS QUICKLY** AWS Cloud9 makes it easy for you to start new projects. Cloud9's development environment comes pre-packaged with tooling for over 40 programming languages, including Node.js, JavaScript, Python, PHP, Ruby, Go, and C++. This enables you to start writing code for popular application stacks within minutes by eliminating the need to install or configure files, SDKs, and plug-ins for your development machine. Because Cloud9 is cloud-based, you can easily maintain multiple development environments to isolate your project's resources. For more info related to AWS-Cloud 9 you all can refer following Docs. https://docs.aws.amazon.com/cloud9/latest/user-guide/aws-cloud9-ug.pdf

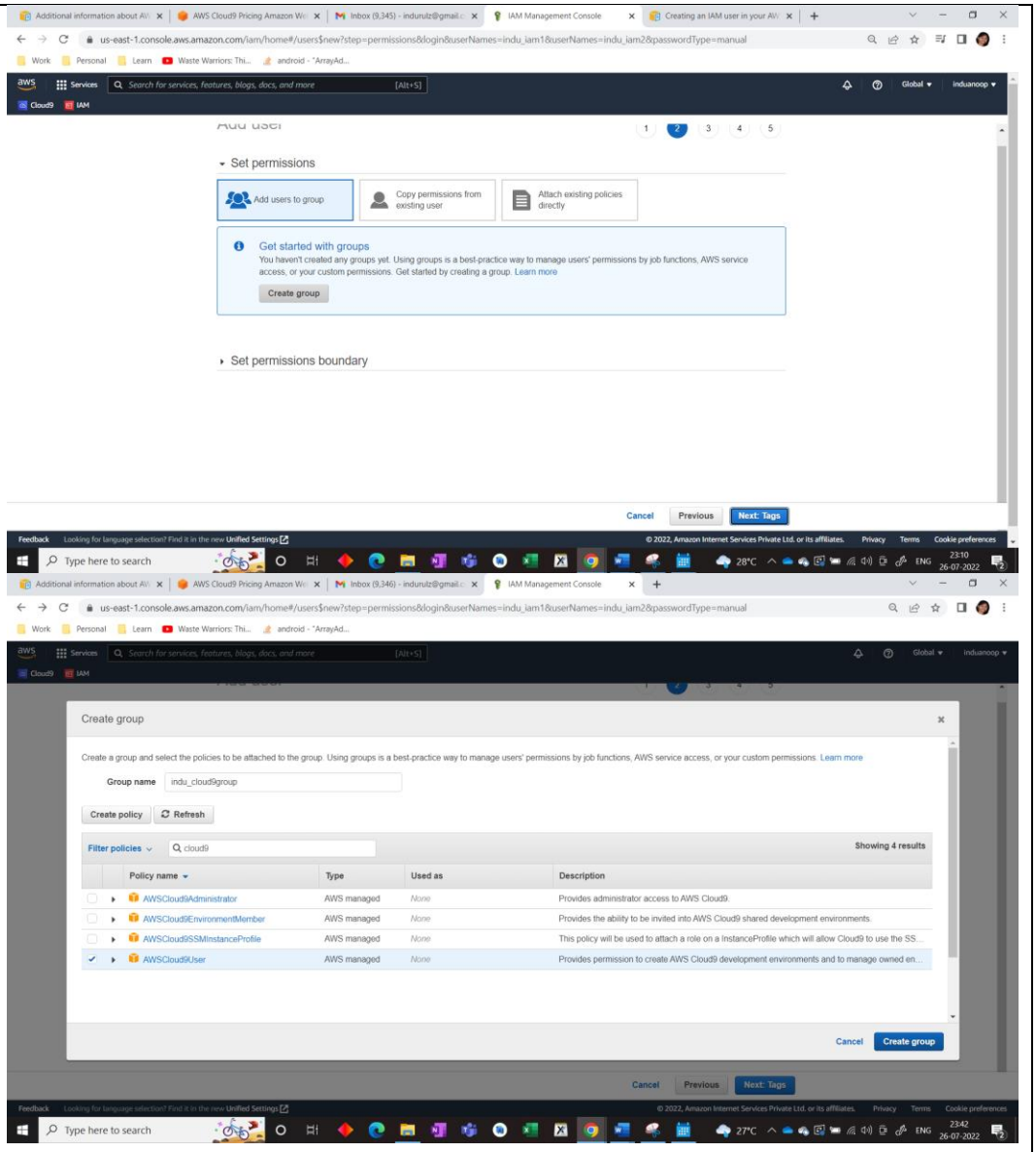
Code	**Steps:** 1. Login with your AWS root account. https://aws.amazon.com/console/ 2. Open IAM (Identity and Access Management) to Add two users. Provide manual password if you want and click on Next permission tab. 3. Click on Create group. Provide group name and attach AwsCloud9EnvironmentMember policy to group. Click on create group. 4. After that group is created click on next if u want to provide tag else click on Review for user settings and click on create user 5. Now Open your Browsers Incognito Window and login with IAM user1 which you configured before. [Cloud9 Environment should be created through IAM user account only and not root account due to security reasons) 6. Navigate to Cloud 9 service from Developer tools section 7. Click on Create Environment 8. Provide name for the Environment (For e.g.: WebAppIDE) and click on next. 9. Keep all the Default settings 10. Review the Environment name and Settings and click on Create Environment 11. Click on cloud9 IDE Environment tab. If you check at bottom side Cloud9 IDE there is AWS CLI for command operations: git version, IAM user1 details. Explore settings where you can update permissions of your teammates as from RW to R only or you can remove user too. 12. Now we will setup collaborative environment. Click on File you can create new file or choose from template, we can opt for html file to collaborate. Edit html file and save it 13. To share this file to collaborate with other members of your team click on Share option on Right Pane and username which you created in IAM before to Invite members and enable permissions as RW (Read and Write) and click on Done. Click OK for Security warning. 14. Now Open your Browsers Incognito Window and login with IAM user2 which you configured before. 15. After Successful login with IAM user2, open Cloud9 service from dashboard services and click on shared with you option from left side panel 16. Double click the IDE that was shared by IAM user1 , you will get same interface as your other member to collaborate in real time, also everyone within team can do group chats.

Output	**Output screenshots:** 1. Login with your AWS root account. https://aws.amazon.com/console/  2. From services, Open **IAM** (Identity and Access Management) to Add two users [For example: indu_iam1,indu_iam2] Provide manual password if you want and click on Next permission tab. 

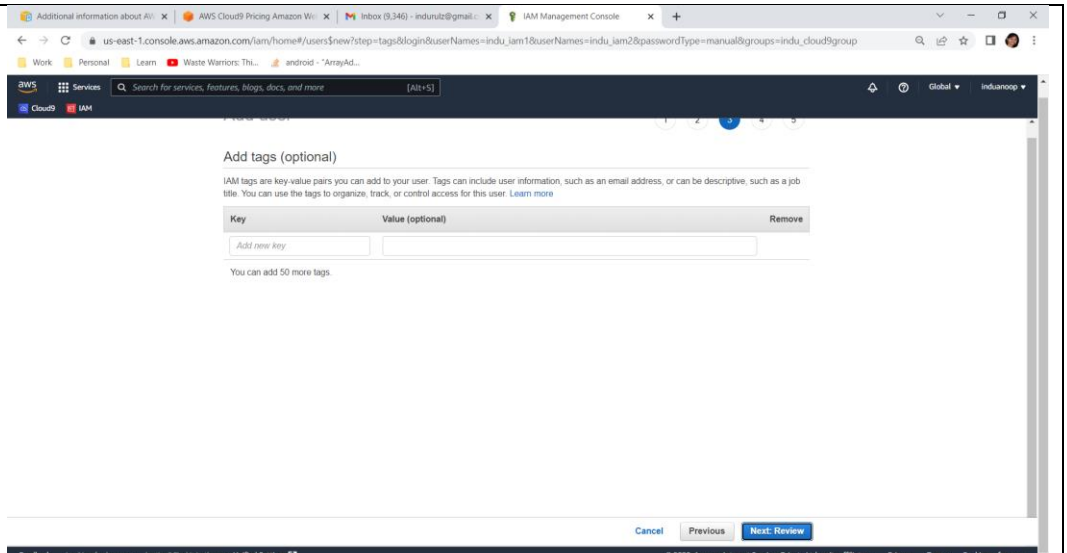


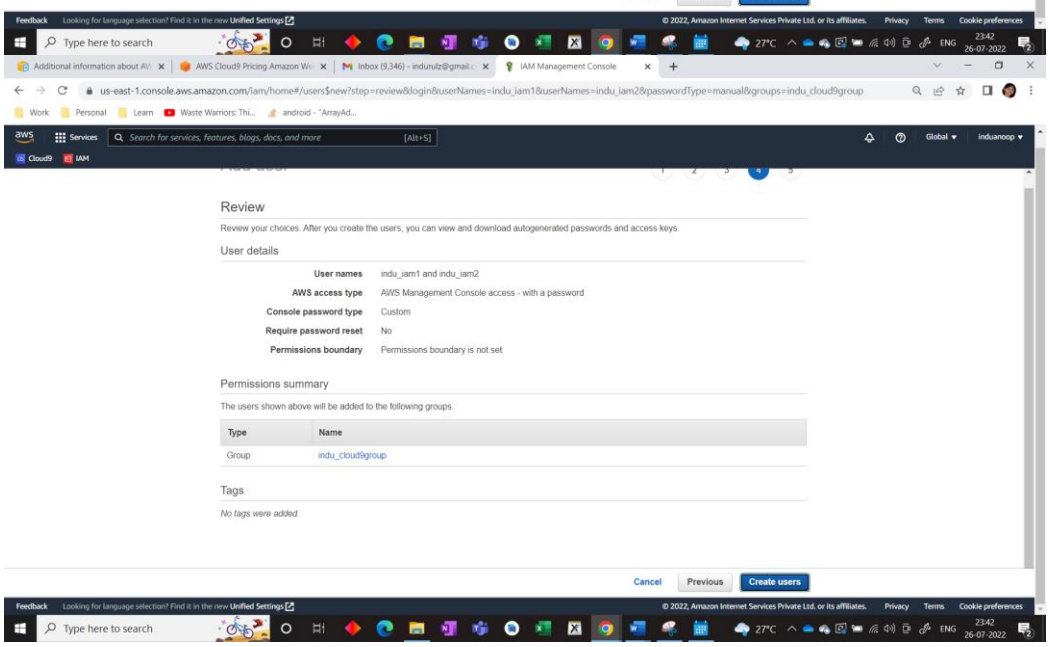


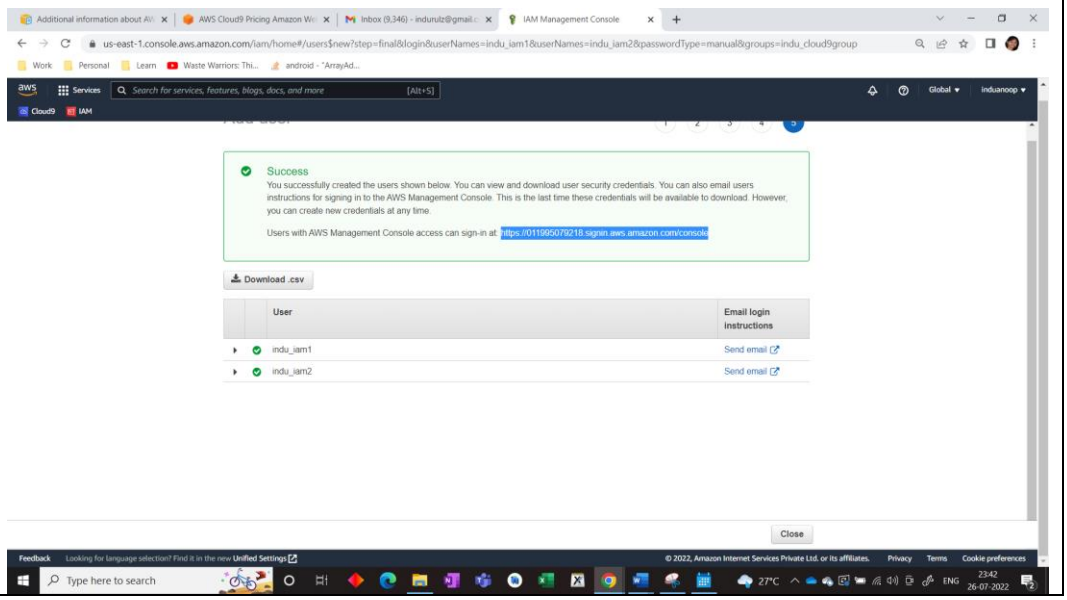
3. Click on **Create group**. Provide group name and attach AwsCloud9EnvironmentMember policy to group. Click on create group.



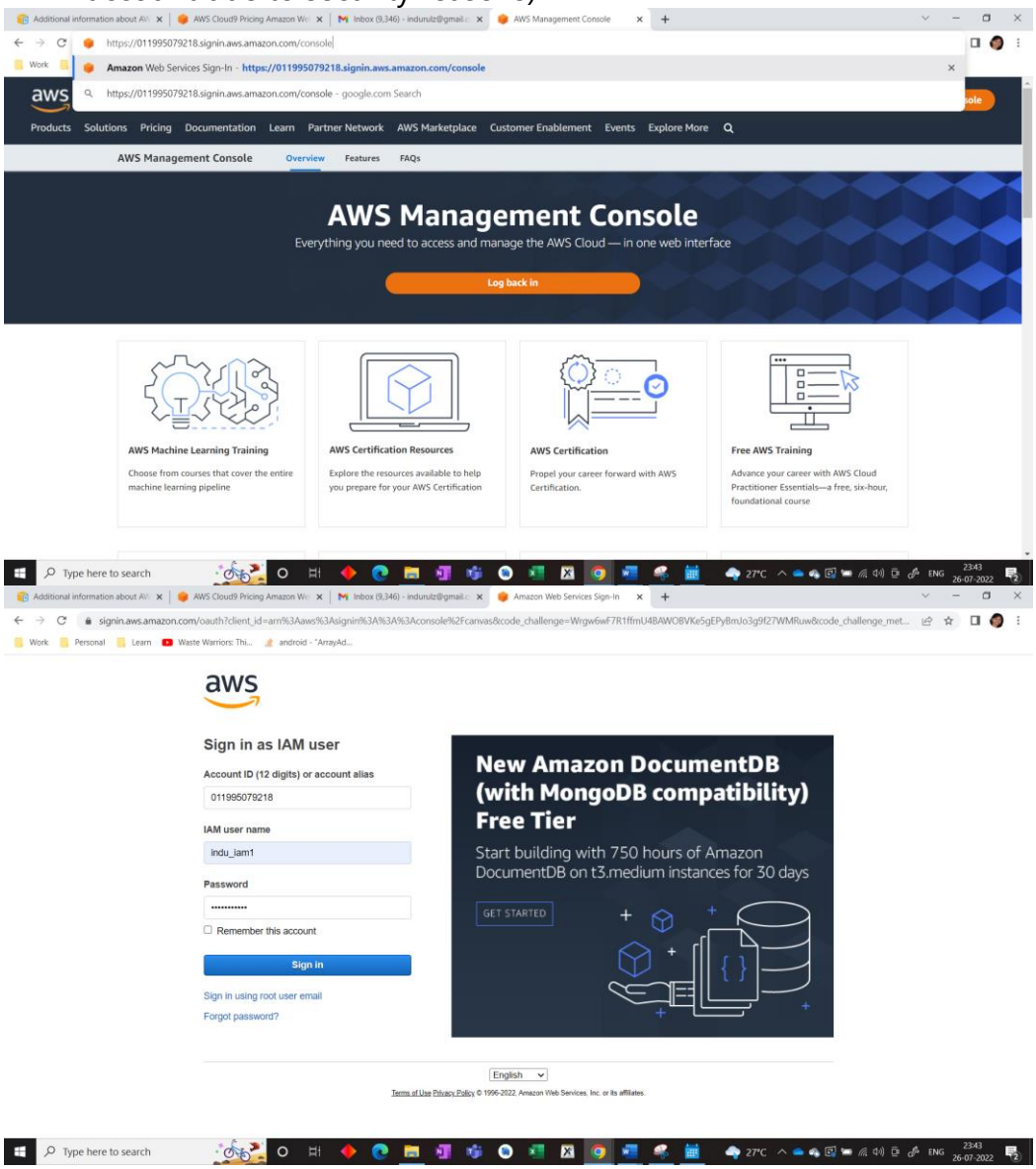
4. After that group is created click on next if u want to provide tag else click on **Review** for user settings and click on **create users.** Copy the sign in access URL for IAM users that is generated


Add tags (optional)
IAM tags are key-value pairs you can add to your user. Tags can include user information, such as an email address, or can be descriptive, such as a job title. You can use the tags to organize, track, or control access for this user. Learn more
Key
Value (optional)
Remove
Add new key
You can add 50 more tags.
Cancel
Previous
Next: Review

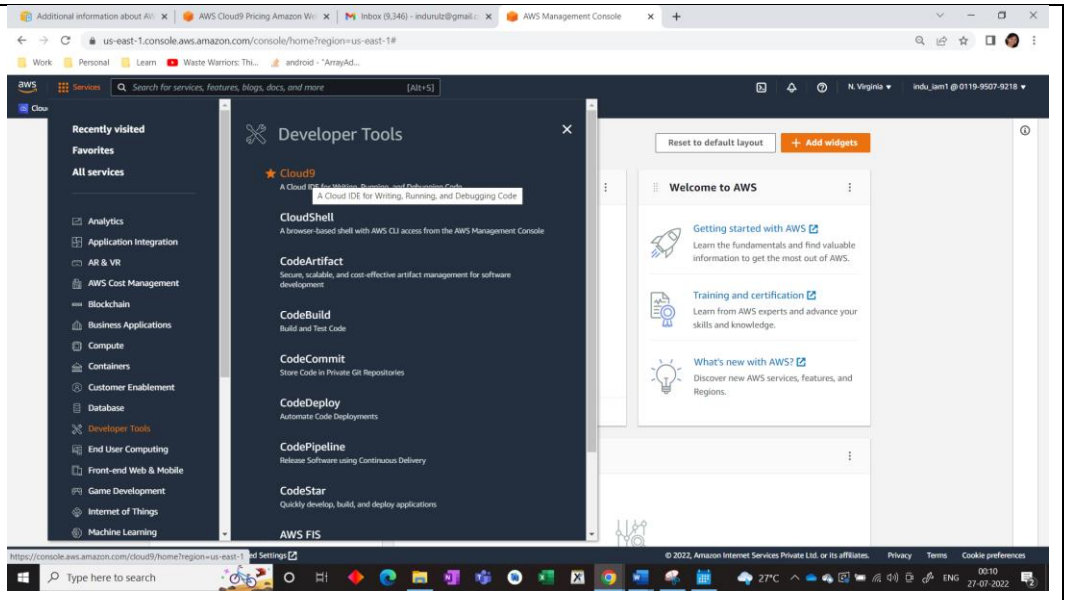

Review
Review your choices. After you create the users, you can view and download autogenerated passwords and access keys.
User details
User names
indu_iam1 and indu_iam2
AWS access type
AWS Management Console access - with a password
Console password type
Custom
Require password reset
No
Permissions boundary
Permissions boundary is not set
Permissions summary
The users shown above will be added to the following groups.
Type
Name
Group
indu_cloud9group
Tags
No tags were added.
Cancel
Previous
Create users

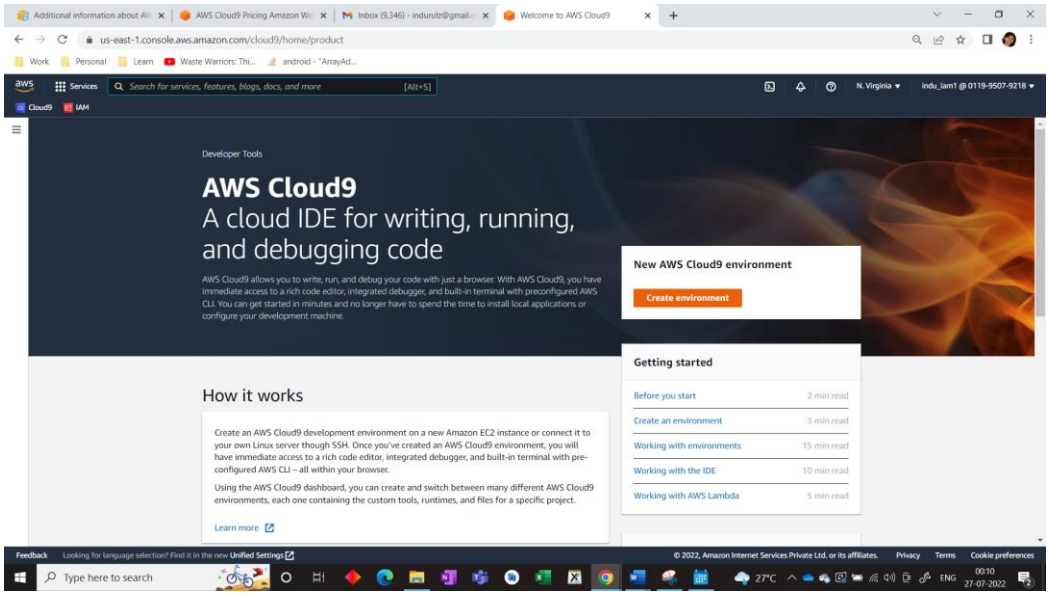

Success
You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.
Users with AWS Management Console access can sign-in at: https://011995079218.signin.aws.amazon.com/console
Download .csv
User
Email login instructions
indu_iam1
Send email
indu_iam2
Send email
Close

5. Log out from root account and paste the URL of copied IAM user sign in to Browsers address box and login as IAM user1 (i.e , indu_iam1) which was configured before. [Cloud9 Environment should be created through IAM user account only and not root account due to security reasons)

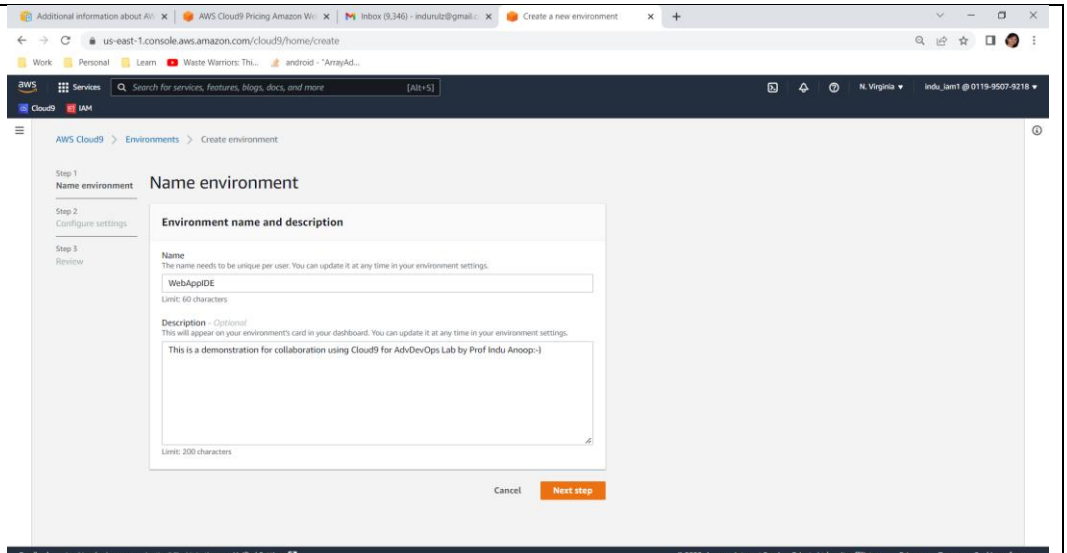


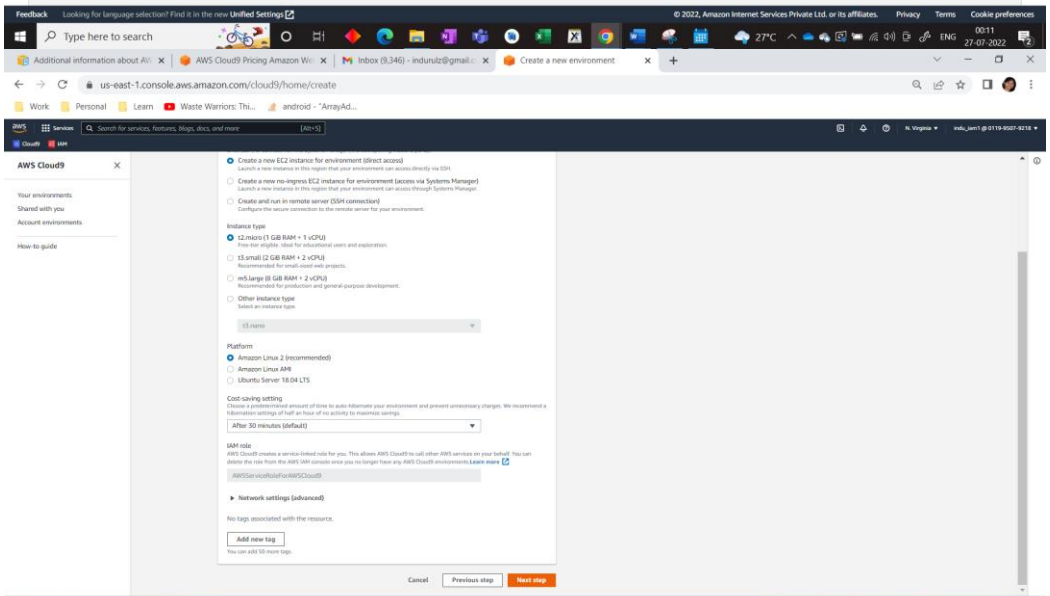
6. Navigate to Cloud 9 service from Developer tools section and Click on Create Environment

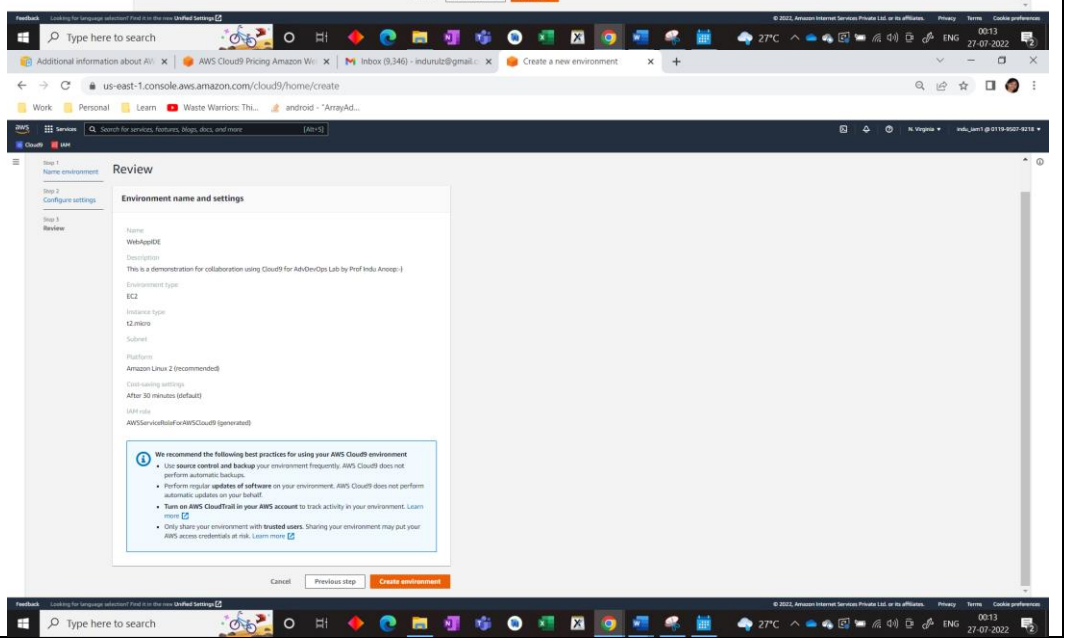


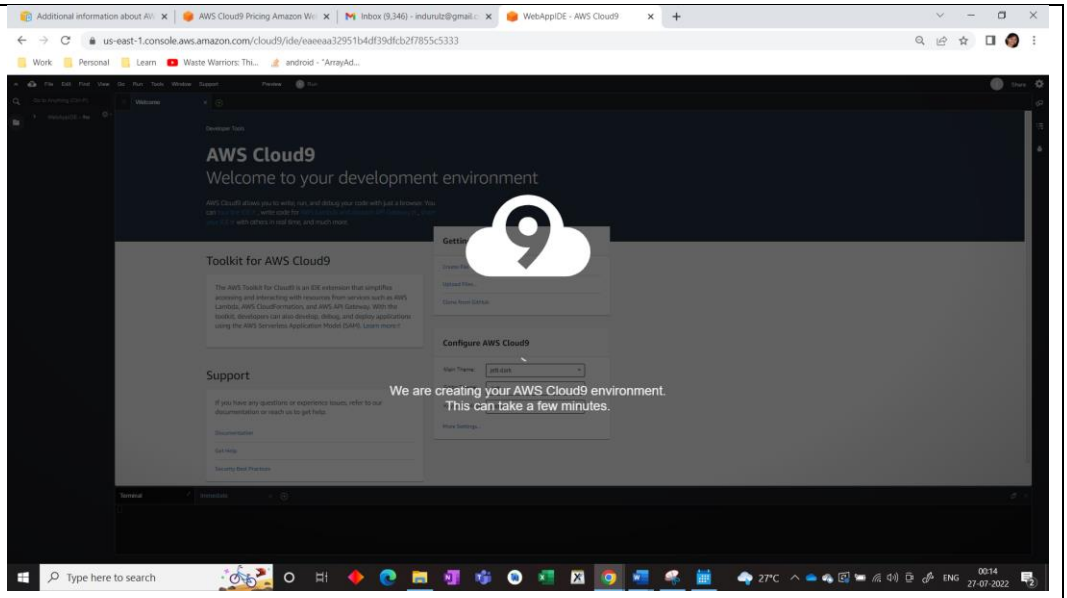


7. Provide name for the Environment (For e.g.: WebAppIDE) and click on next. Keep all the Default settings. Review the Environment name and Settings and click on Create Environment

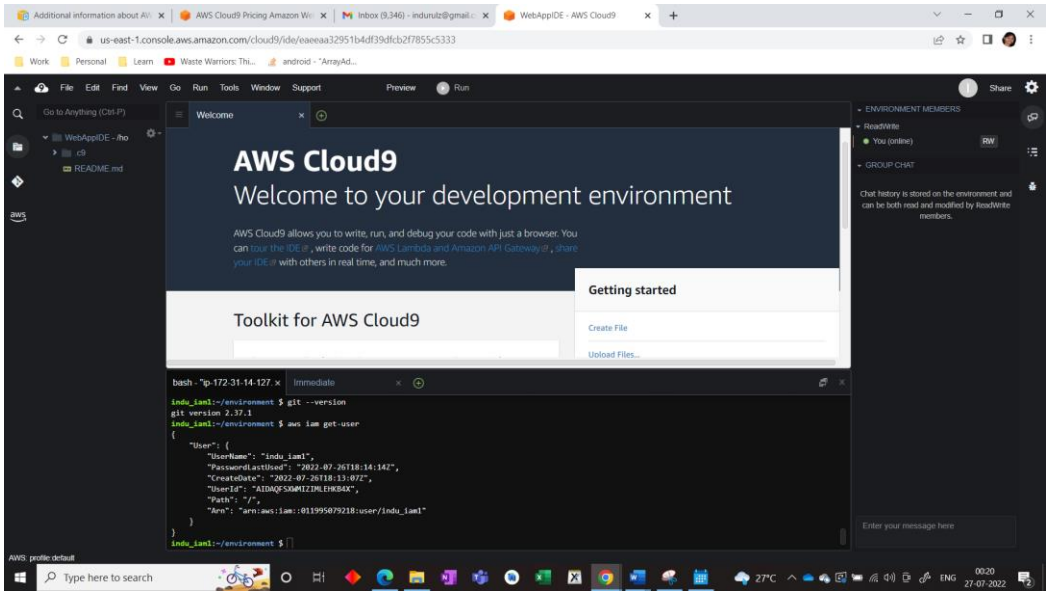

us-east-1.console.aws.amazon.com/cloud9/home/create
AWS Cloud9 > Environments > Create environment
Step 1
Name environment
Step 2
Configure settings
Step 3
Review
Name environment
Environment name and description
Name
The name needs to be unique per user. You can update it at any time in your environment settings.
WebAppIDE
Limit: 60 characters
Description - Optional
This will appear on your environment's card in your dashboard. You can update it at any time in your environment settings.
This is a demonstration for collaboration using Cloud9 for AdvDevOps Lab by Prof Indu Anoop:-)
Limit: 200 characters
Cancel
Next step


AWS Cloud9
Your environments
Shared with you
Account environments
How-to guide
Create a new EC2 instance for environment (direct access)
Create a new no-ingress EC2 instance for environment (access via Systems Manager)
Create and run in remote server (SSH connection)
Instance type
t2.micro (1 GiB RAM + 1 vCPU)
t3.small (2 GiB RAM + 2 vCPU)
m5.large (8 GiB RAM + 2 vCPU)
Other instance type
Platform
Amazon Linux 2 (recommended)
Amazon Linux AMI
Ubuntu Server 18.04 LTS
Cost-saving setting
After 30 minutes (default)
IAM role
Network settings (advanced)
No tags associated with the resource.
Add new tag
Cancel
Previous step
Next step

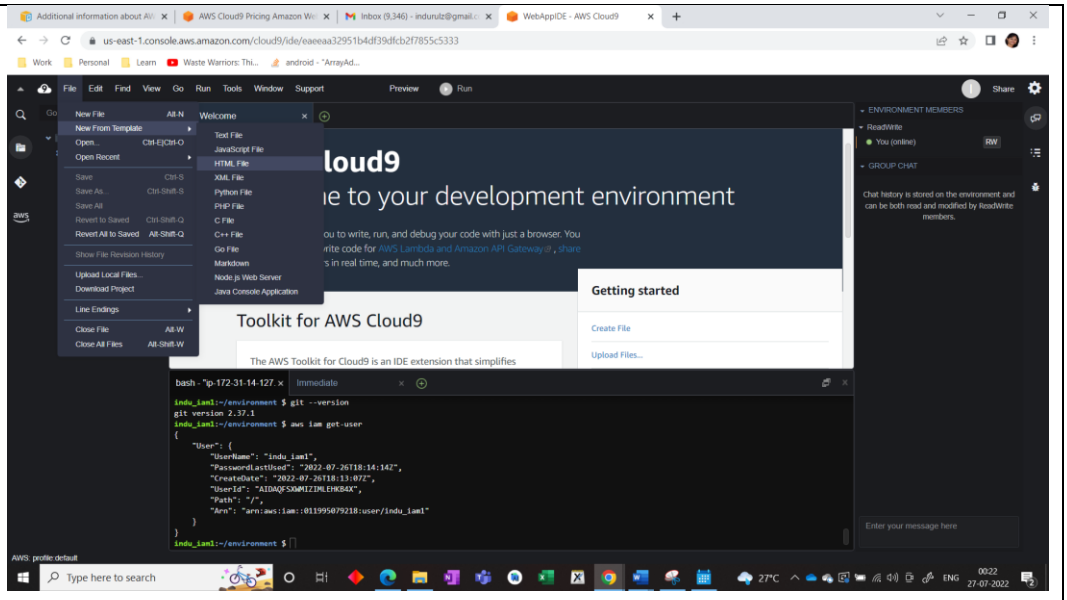

us-east-1.console.aws.amazon.com/cloud9/home/create
Review
Environment name and settings
Name
WebAppIDE
Description
This is a demonstration for collaboration using Cloud9 for AdvDevOps Lab by Prof Indu Anoop:-)
Environment type
EC2
Instance type
t2.micro
Subnet
Platform
Amazon Linux 2 (recommended)
Cost-saving settings
After 30 minutes (default)
IAM role
AWSServiceRoleForAWSCloud9 (generated)
We recommend the following best practices for using your AWS Cloud9 environment
Use source control and backup your environment frequently. AWS Cloud9 does not perform automatic backups.
Perform regular updates of software on your environment. AWS Cloud9 does not perform automatic updates on your behalf.
Turn on AWS CloudTrail in your AWS account to track activity in your environment. Learn more
Only share your environment with trusted users. Sharing your environment may put your AWS access credentials at risk. Learn more
Cancel
Previous step
Create environment

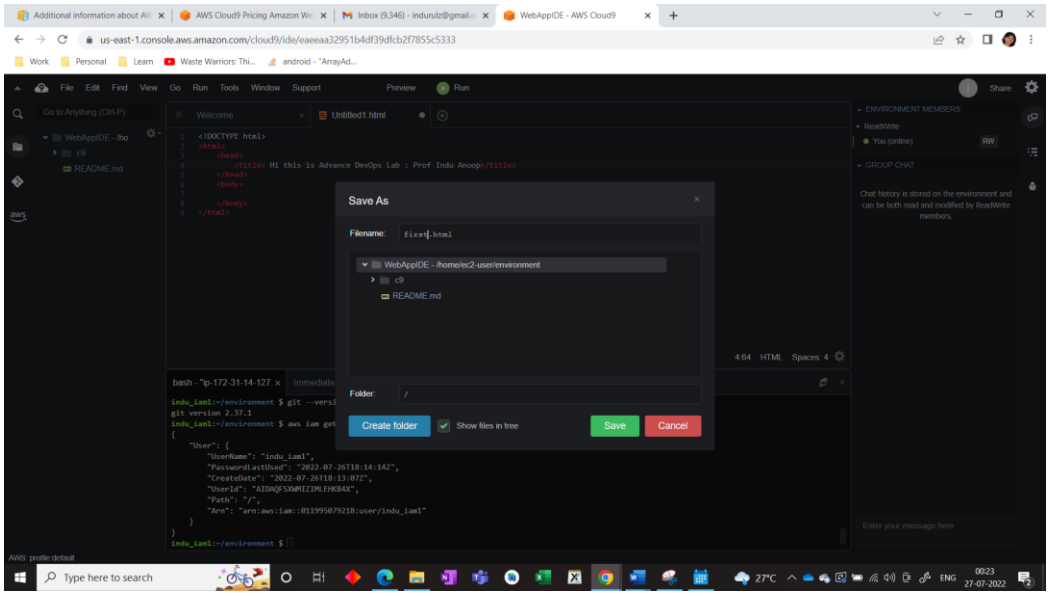


8. If you check at bottom side Cloud9 IDE there is AWS CLI for command operations: git version, IAM user details. Explore settings where you can update permissions of your teammates as from RW to R only or you can remove user too. Also a group chat window.

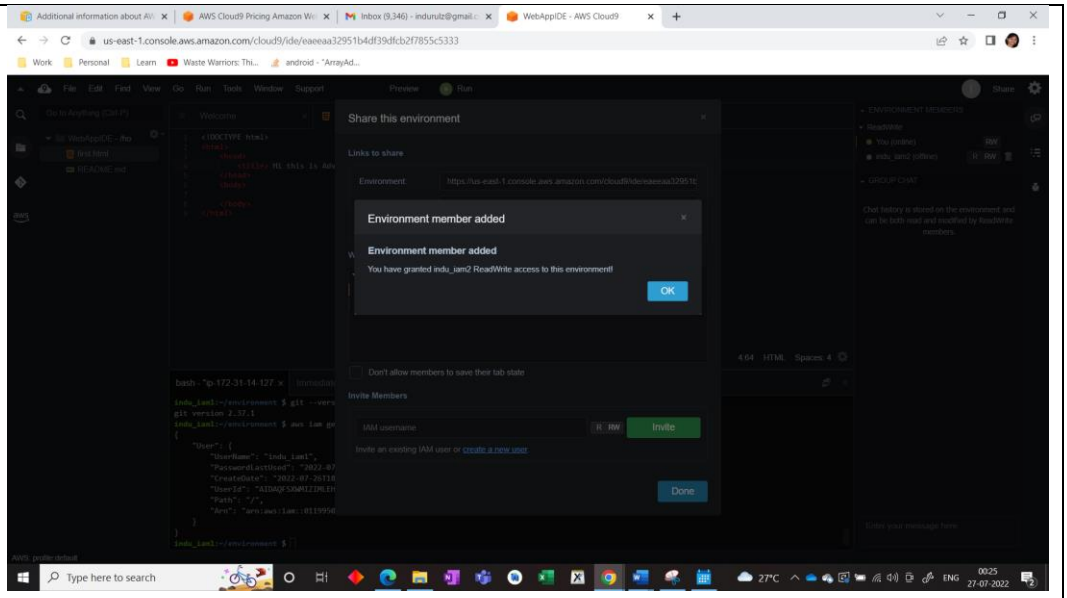


9. Now we will setup collaborative environment. Click on File you can create new file or choose from template, we can opt for html file to collaborate. Edit html file and save it (Ctrl+S)

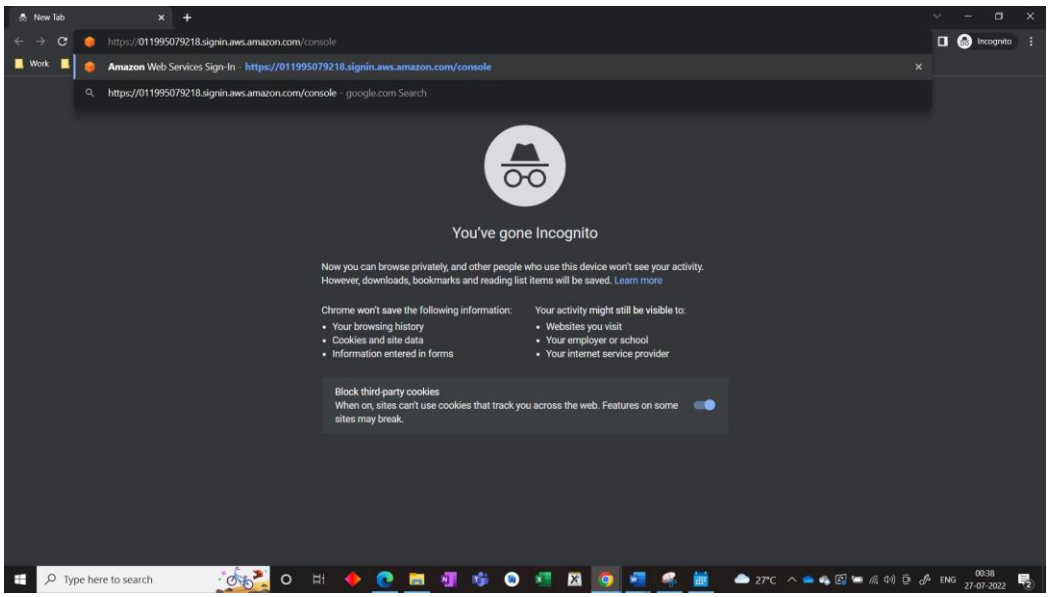


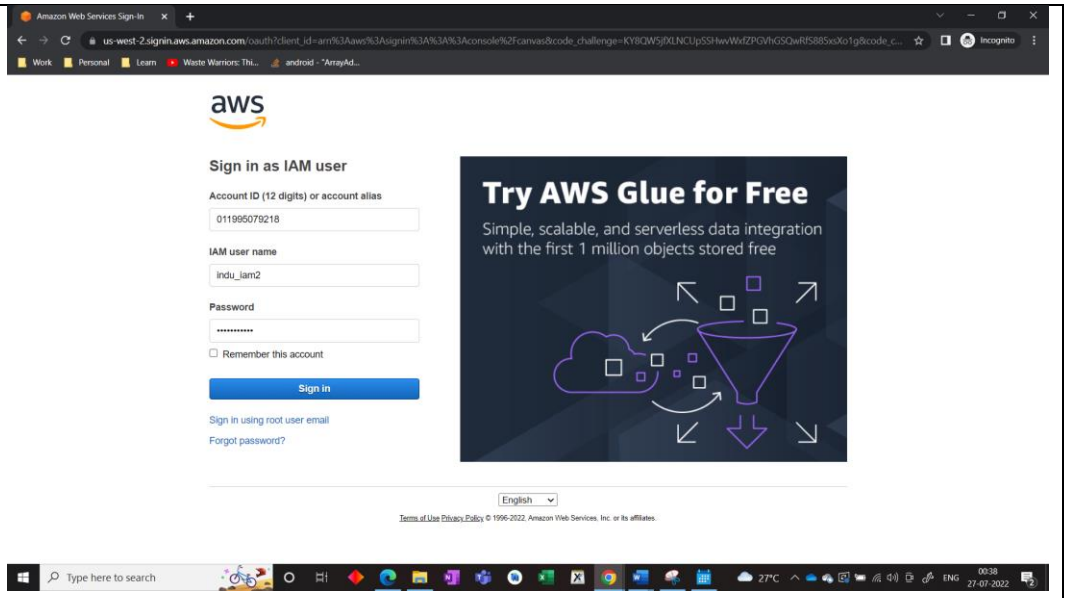


10. To share this file to collaborate with other members of your team click on Share option on Top Right Pane and enter username of IAM user2 which you created in before (indu_iam2) to Invite members and enable permissions as RW (Read and Write) and click on Done. Click OK for Security warning. Click OK and Done.

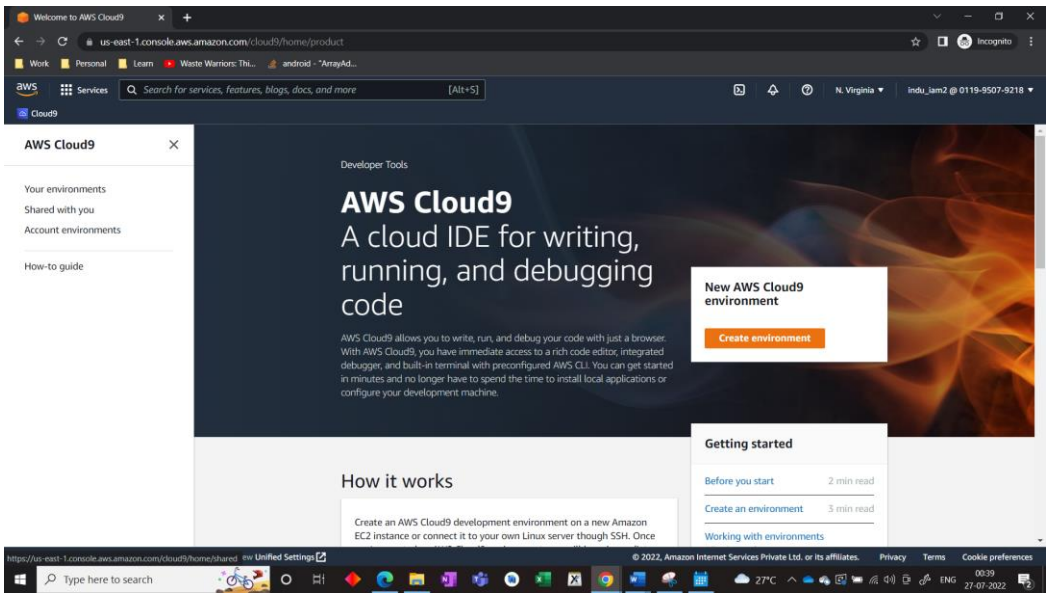


11. Now Open your Browsers Incognito Window , paste URL of IAM user sign -in which was copied before into address box of browser and login with IAM user2 which you configured before (indu_iam2).

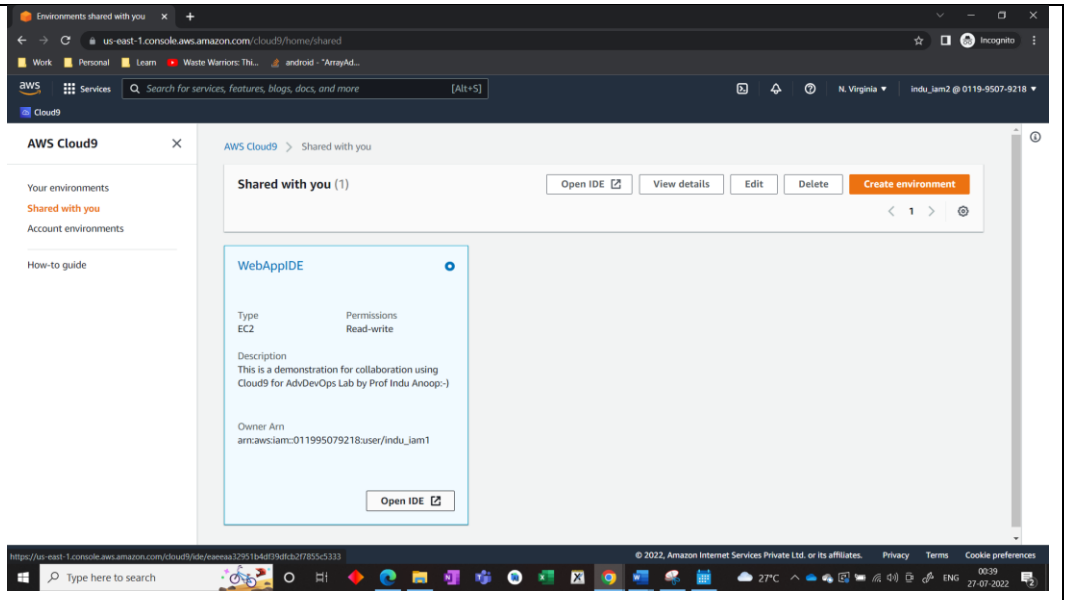


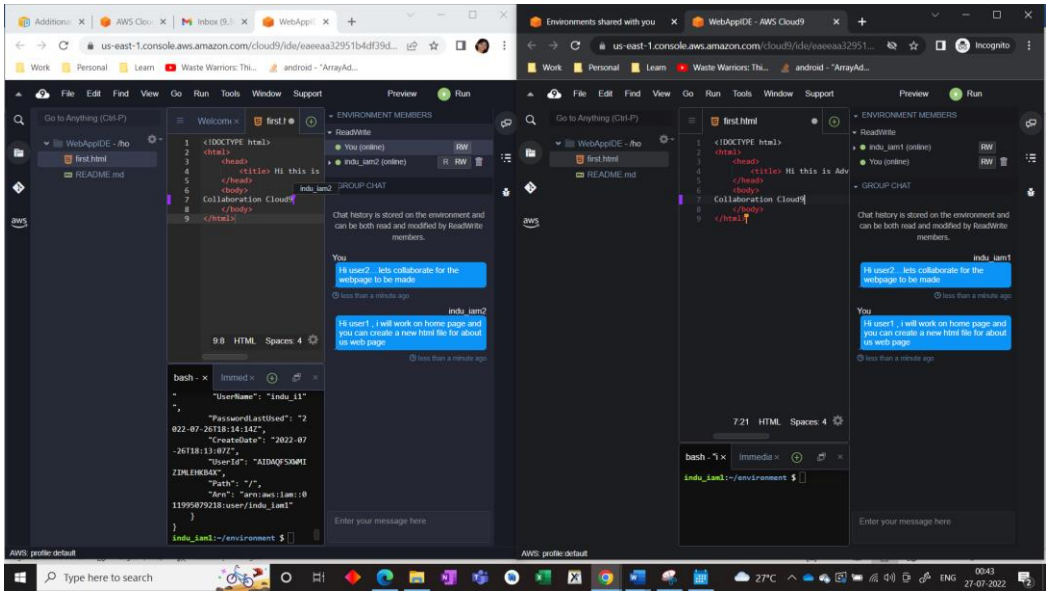


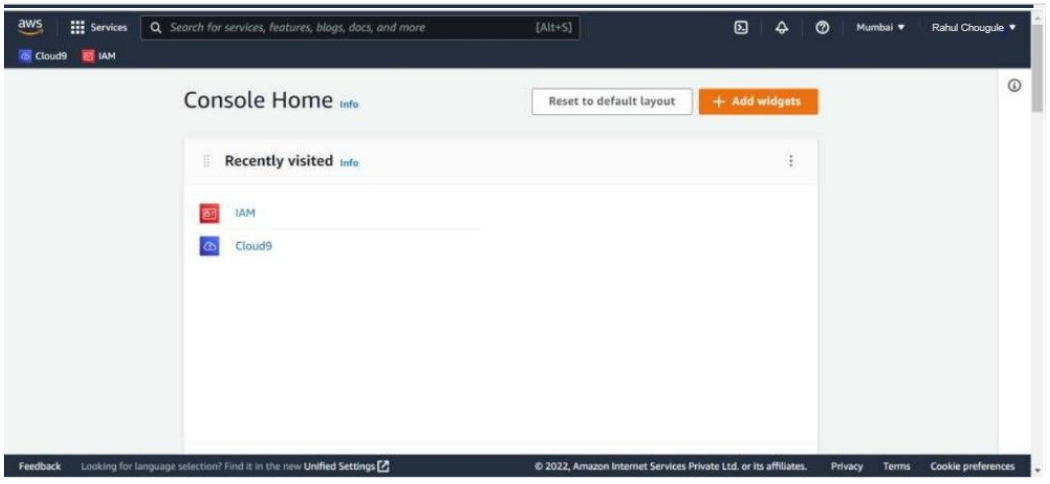
12. After Successful login with IAM user2, open Cloud9 service from dashboard services and click on shared with you option from left side panel

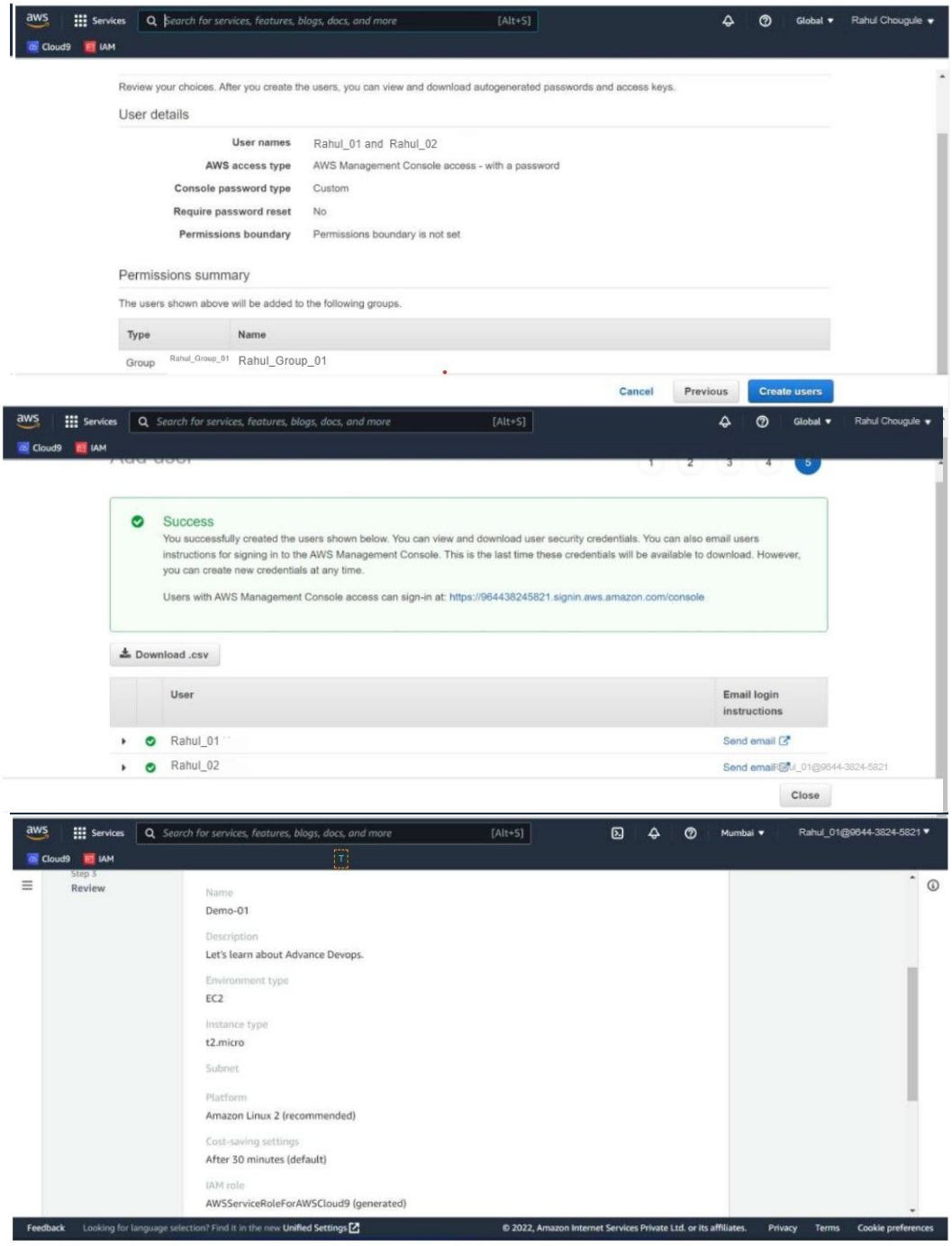


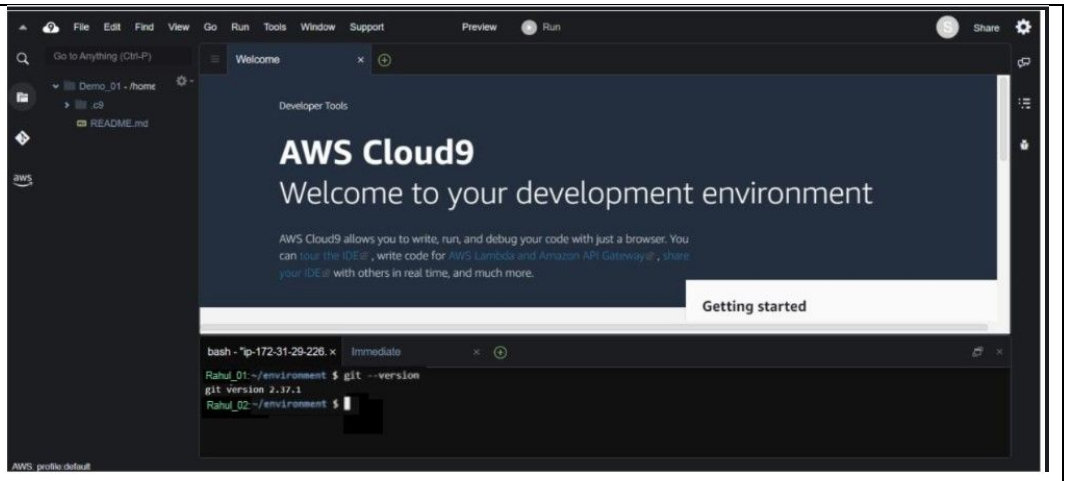
13. Double click the IDE/Click on Open IDE button of WebAppIDE that was shared by IAM user1 , you will get same interface as your other member to collaborate in real time, also everyone within team can do group chats.

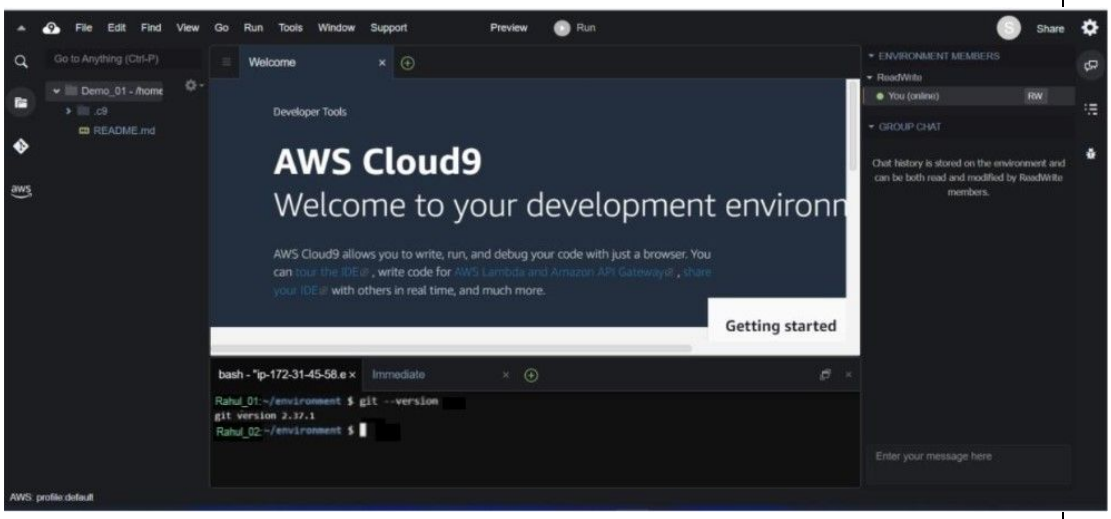

Environments shared with you
us-east-1.console.aws.amazon.com/cloud9/home/shared
Search for services, features, blogs, docs, and more [Alt+S]
N. Virginia
indu_iam2 @ 0119-9507-9218
AWS Cloud9
Your environments
Shared with you
Account environments
How-to guide
AWS Cloud9 > Shared with you
Shared with you (1)
Open IDE
View details
Edit
Delete
Create environment
WebAppIDE
Type
EC2
Permissions
Read-write
Description
This is a demonstration for collaboration using Cloud9 for AdvDevOps Lab by Prof Indu Anoop:-)
Owner Arn
arn:aws:iam::011995079218:user/indu_iam1
Open IDE
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences
Type here to search

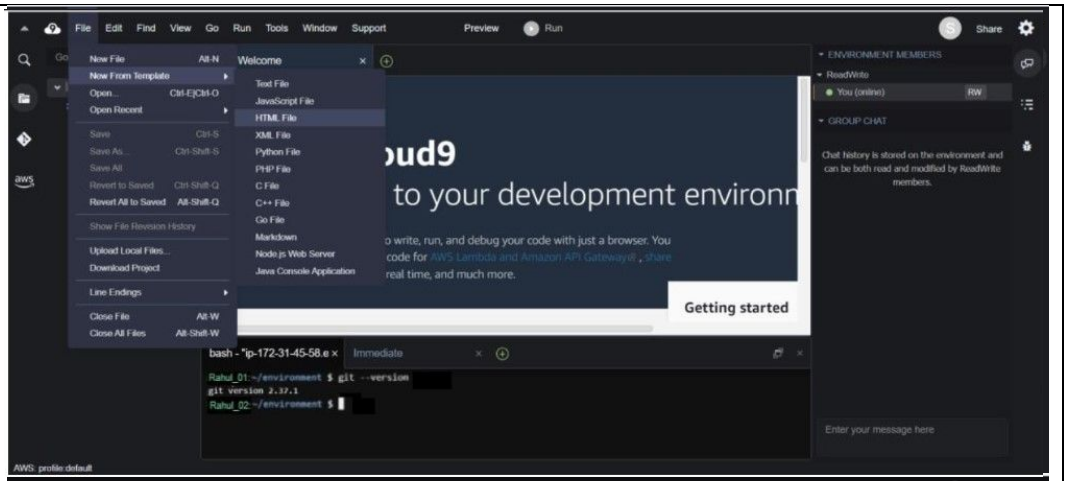

Environments shared with you
WebAppIDE - AWS Cloud9
ENVIRONMENT MEMBERS
GROUP CHAT
Chat history is stored on the environment and can be both read and modified by ReadWrite members.
Hi user2... lets collaborate for the webpage to be made
Hi user1 , i will work on home page and you can create a new html file for about us web page
Enter your message here
AWS: profile:default
Type here to search

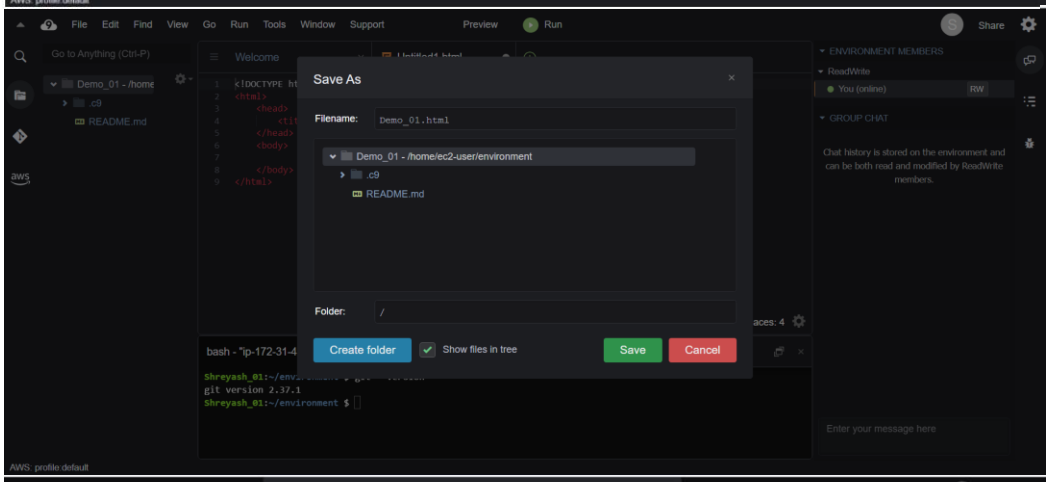

Services
Search for services, features, blogs, docs, and more [Alt+S]
Mumbai
Rahul Chougule
Cloud9
IAM
Console Home Info
Reset to default layout
+ Add widgets
Recently visited Info
IAM
Cloud9
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences

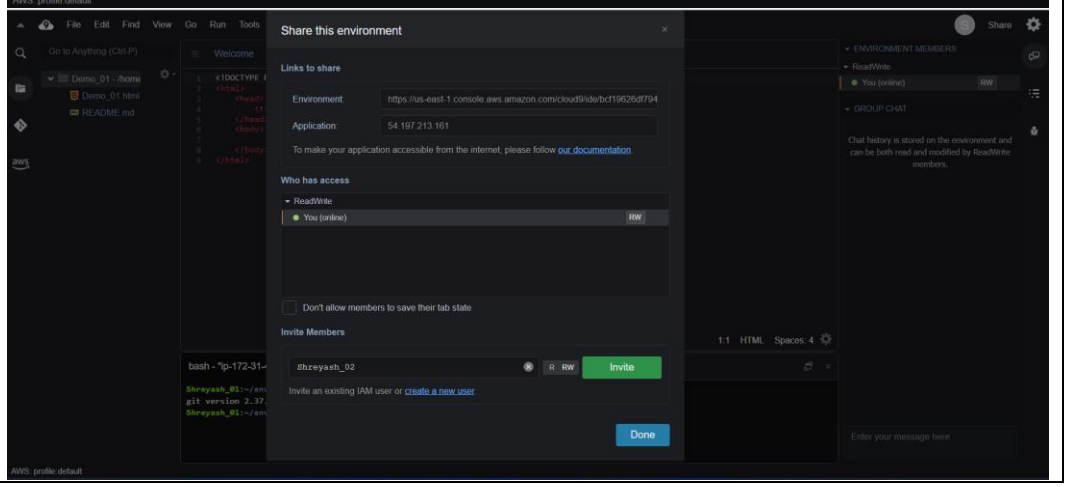

Search for services, features, blogs, docs, and more [Alt+S]
Global
Rahul Chougule
Cloud9
IAM
Review your choices. After you create the users, you can view and download autogenerated passwords and access keys.
User details
User names
Rahul_01 and Rahul_02
AWS access type
AWS Management Console access - with a password
Console password type
Custom
Require password reset
No
Permissions boundary
Permissions boundary is not set
Permissions summary
The users shown above will be added to the following groups.
Type
Name
Group
Rahul_Group_01
Cancel
Previous
Create users
Success
You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.
Users with AWS Management Console access can sign-in at: https://964438245821.signin.aws.amazon.com/console
Download .csv
User
Email login instructions
Rahul_01
Send email
Rahul_02
Send email
Close
Mumbai
Rahul_01@9644-3824-5821
Step 3
Review
Name
Demo-01
Description
Let's learn about Advance Devops.
Environment type
EC2
Instance type
t2.micro
Subnet
Platform
Amazon Linux 2 (recommended)
Cost-saving settings
After 30 minutes (default)
IAM role
AWSServiceRoleForAWSCloud9 (generated)
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences

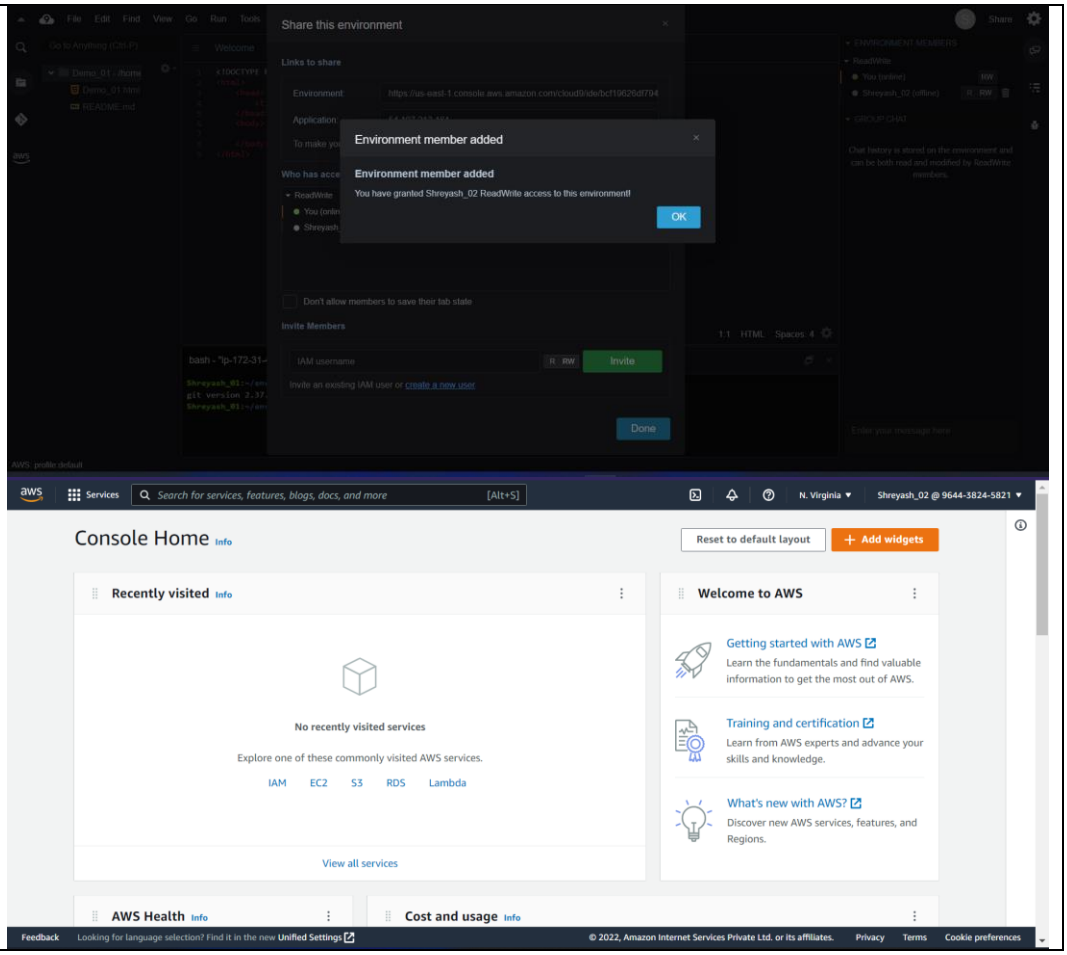

File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Demo_01 - /home
.c9
README.md
Welcome
Developer Tools
AWS Cloud9
Welcome to your development environment
AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.
Getting started
bash - "ip-172-31-29-226.
Immediate
Rahul_01:~/environment $ git --version
git version 2.37.1
Rahul_02:~/environment $
AWS: profile:default

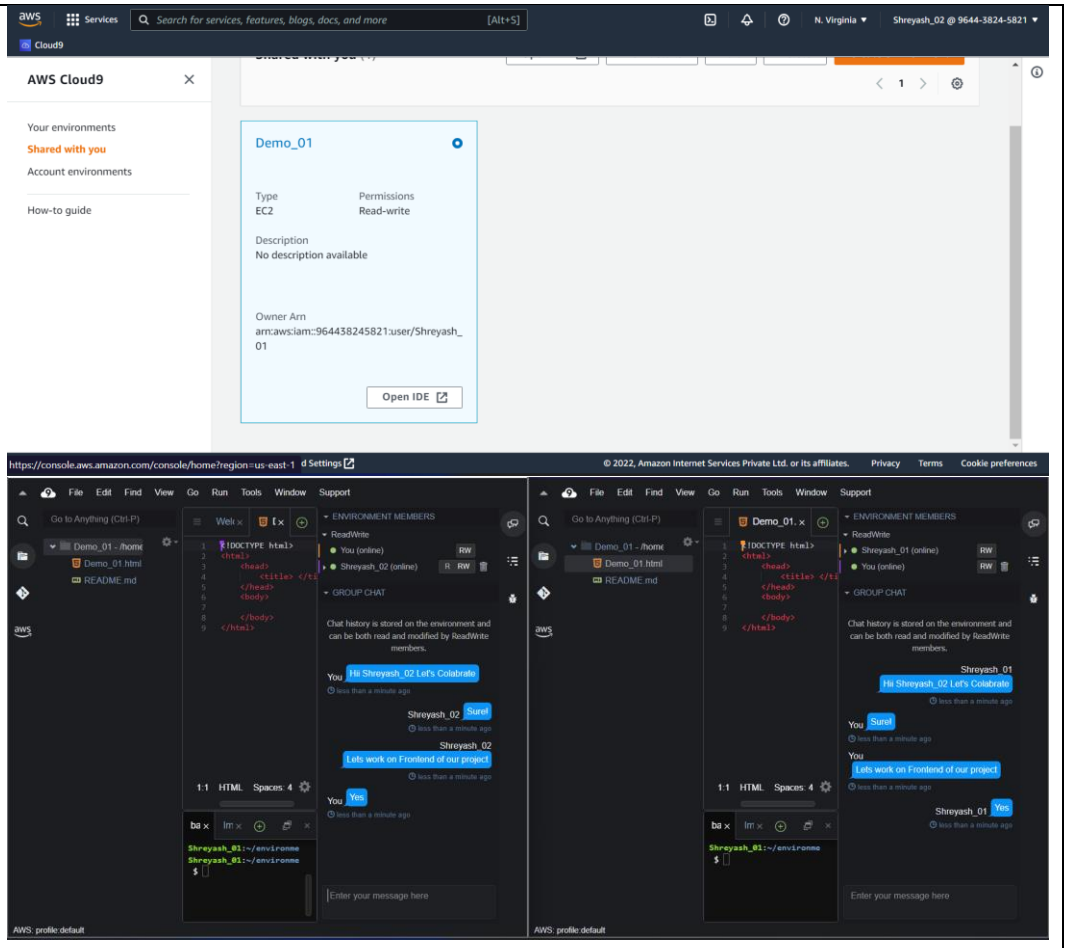

File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Demo_01 - /home
.c9
README.md
Welcome
Developer Tools
AWS Cloud9
Welcome to your development environn
AWS Cloud9 allows you to write, run, and debug your code with just a browser. You can tour the IDE, write code for AWS Lambda and Amazon API Gateway, share your IDE with others in real time, and much more.
Getting started
bash - "ip-172-31-45-58.e
Immediate
Rahul_01:~/environment $ git --version
git version 2.37.1
Rahul_02:~/environment $
ENVIRONMENT MEMBERS
ReadWrite
You (online)
RW
GROUP CHAT
Chat history is stored on the environment and can be both read and modified by ReadWrite members.
Enter your message here
AWS: profile:default


File Edit Find View Go Run Tools Window Support
Preview
Run
Share
New File Alt-N
New From Template
Open... Ctrl-E|Ctrl-O
Open Recent
Save Ctrl-S
Save As... Ctrl-Shift-S
Save All
Revert to Saved Ctrl-Shift-Q
Revert All to Saved Alt-Shift-Q
Show File Revision History
Upload Local Files...
Download Project
Line Endings
Close File Alt-W
Close All Files Alt-Shift-W
Welcome
Text File
JavaScript File
HTML File
XML File
Python File
PHP File
C File
C++ File
Go File
Markdown
Node.js Web Server
Java Console Application
to your development environn
write, run, and debug your code with just a browser. You
code for AWS Lambda and Amazon API Gateway®, share
real time, and much more.
Getting started
ENVIRONMENT MEMBERS
ReadWrite
You (online)
RW
GROUP CHAT
Chat history is stored on the environment and can be both read and modified by ReadWrite members.
bash - "ip-172-31-45-58.e
Immediate
Rahul_01:~/environment $ git --version
git version 2.37.1
Rahul_02:~/environment $
Enter your message here
AWS: profile:default


File Edit Find View Go Run Tools Window Support
Preview
Run
Share
Go to Anything (Ctrl-P)
Demo_01 - /home
.c9
README.md
Welcome
Save As
Filename: Demo_01.html
Demo_01 - /home/ec2-user/environment
.c9
README.md
Folder: /
Create folder
Show files in tree
Save
Cancel
ENVIRONMENT MEMBERS
ReadWrite
You (online)
RW
GROUP CHAT
Chat history is stored on the environment and can be both read and modified by ReadWrite members.
bash - "ip-172-31-4
Shreyash_01:~/environment $
git version 2.37.1
Shreyash_01:~/environment $
Enter your message here
AWS: profile:default


Share this environment
Links to share
Environment: https://us-east-1.console.aws.amazon.com/cloud9/ide/bcf19626df794
Application: 54.197.213.161
To make your application accessible from the internet, please follow our documentation.
Who has access
ReadWrite
You (online)
RW
Don't allow members to save their tab state
Invite Members
Shreyash_02
R RW
Invite
Invite an existing IAM user or create a new user
Done
Share
ENVIRONMENT MEMBERS
ReadWrite
You (online)
RW
GROUP CHAT
Chat history is stored on the environment and can be both read and modified by ReadWrite members.
1:1 HTML Spaces: 4
Enter your message here
AWS: profile:default


Share this environment
Links to share
Environment
Application
Environment member added
Environment member added
You have granted Shreyash_02 ReadWrite access to this environment!
OK
Don't allow members to save their tab state
Invite Members
IAM username
Invite
Done
Console Home Info
Reset to default layout
Add widgets
Recently visited Info
No recently visited services
Explore one of these commonly visited AWS services.
IAM
EC2
S3
RDS
Lambda
View all services
Welcome to AWS
Getting started with AWS
Learn the fundamentals and find valuable information to get the most out of AWS.
Training and certification
Learn from AWS experts and advance your skills and knowledge.
What's new with AWS?
Discover new AWS services, features, and Regions.
AWS Health Info
Cost and usage Info
Feedback
Looking for language selection? Find it in the new Unified Settings
© 2022, Amazon Internet Services Private Ltd. or its affiliates.
Privacy
Terms
Cookie preferences

	
Conclusion	Learnt collaboration using AWS Cloud9 IDE.