TASK 19

1. GitLab CI/CD :

GitLab CI/CD is an integrated software development tool within the **GitLab DevSecOps platform** that automates the entire software delivery process, from the initial code commit to deployment in production environments. It helps teams implement continuous methodologies including Continuous Integration (CI), Continuous Delivery (CD), and Continuous Deployment (CD).

- **.gitlab-ci.yml file:** The YAML file where pipeline logic, stages, and jobs are defined.
- **Pipelines:** The top-level components that orchestrate the sequence of building, testing, and deploying the code.
- **Jobs:** The fundamental tasks executed by a runner.
- **Stages:** Define the order in which jobs run.
- **Runners:** The execution agents that run the jobs (can be GitLab-hosted or self-managed).
- **CI/CD Variables:** Key-value pairs used to store and pass configuration or sensitive information (like API keys) securely to jobs.
- **Artifacts and Cache:** Mechanisms to store intermediate build results and speed up subsequent jobs by saving dependencies.

GitLab CI/CD persetup:

Ssh-keygen -t rsa (create key pair in git bash - public key and private key)

```
Sarav@hp MINGW64 ~
$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/c/Users/Sarav/.ssh/id_rsa):
Enter passphrase for "/c/Users/Sarav/.ssh/id_rsa" (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /c/Users/Sarav/.ssh/id_rsa
Your public key has been saved in /c/Users/Sarav/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:vqYga7V1LKkR1kwwqx33ymcJj2jjXScnTOIbtlfzYZk Sarav@hp
The key's randomart image is:
+---[RSA 3072]----+
|    o.           |
|     o.          |
|    o+.          |
|   oooo.       o |
|  .....oS   o E  |
|    oo+Oo= . + . |
|  ..==+o& =   .  |
|  .=o+ +.@       |
| .. . oo. .      |
+----[SHA256]-----+
```

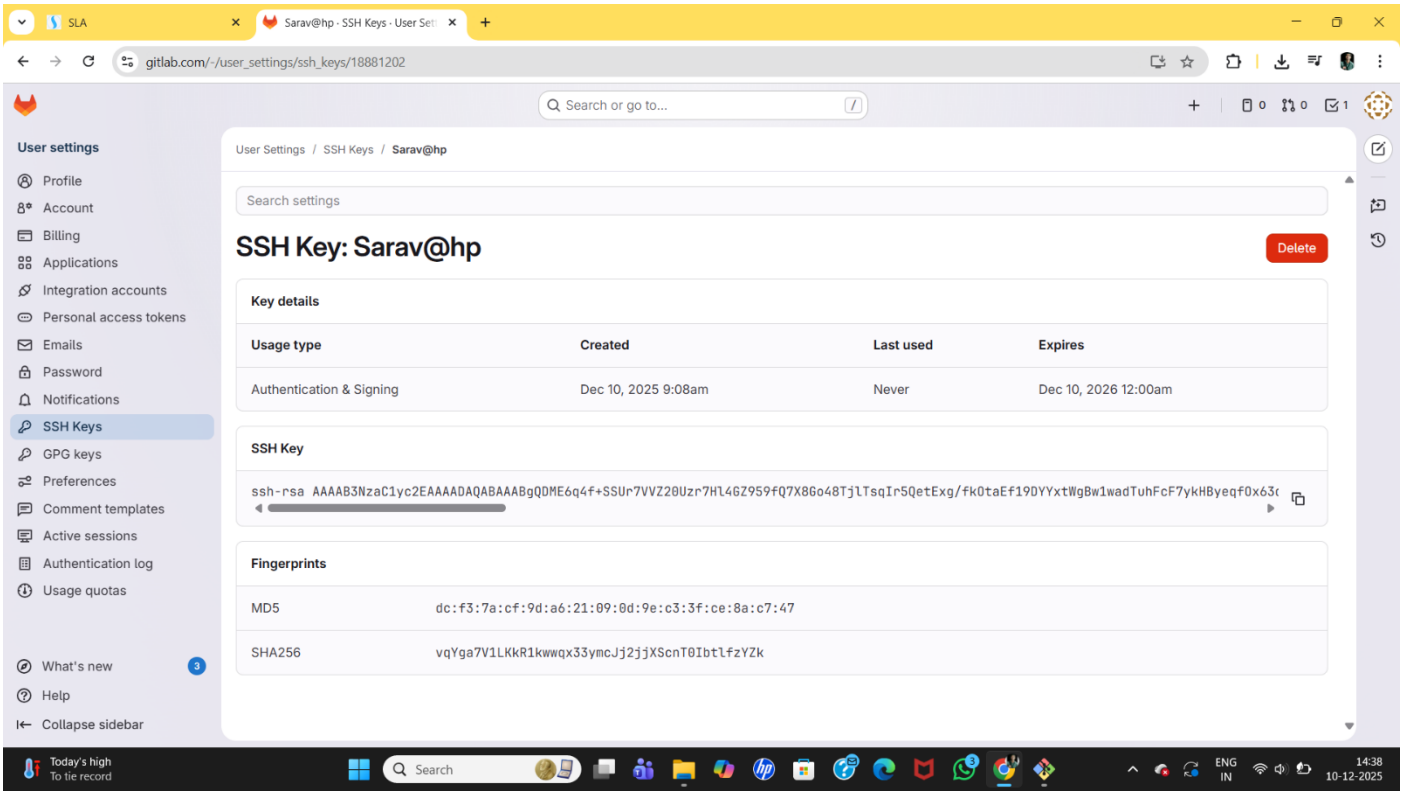
- Private key

```
Sarav@hp MINGW64 ~
$ cat ~/.ssh/id_rsa
-----BEGIN OPENSSH PRIVATE KEY-----
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAABlwAAAAdzc2gtcn
NhAAAAAwEAAQAAAYEAzBOquH/kklK+1VWdtFM6+x5eBmfefXOO1/BqOPE45U7KiK+UHrRM
YP35DrWhH9fQ2GMbVoAcNcGnU7oRXBe8pBwcnqnzset6oO/V7xmfClPguwKuIidl2FS92/
7wkJkDBVSGzMSQgONcEK4LVo7SyzPrabeMGiasJQ2ks/NcO4HYqHsJv/VvlUNnoluPNrO5
2pWCDSsqChUvCV2U2OV/yELiOOzBGa1JyGIB1YAWfrLyoZKWpS7jOtGP+TMSwuo1D+V5Na
ezdhS9ZBpDiiE3t2U9DqZ3nY1iBqWE1d++KnAqUs/DFwKha83FjOtOYCsRT3WZiFDB8UhM
u3Ecj42ABDvJQisHZOwRBtcmlpbXB9G76kk25RS/1ioEnilFA47HAnIvbyPOLXIAuoSG5G
32bMhSlWIumMciAQyWH7Ozqcid7uwOr4ELYpH5PO5HIbpV/w7fV8LtJvmktSOEK+shnTYG
T5t1VTyOuZUssu2uOTRW49Ex7ITy586YXAA3S9FjAAAFgFhEnuNYRJ7jAAAAB3NzaC1yc2
EAAAGBAMwTqrh/5JJSvtVVnbRTOvseXgZn3n19DtfwajjxOOVOyoivlB6OTGD9+Q61oR/X
ONhjG1aAHDXBp1O6EVwXvKQcHJ6p87HreqNP1e8ZnwpT4LsCriInZdhUvdv+8JCZAwVUhs
zEkINDXBCuC1aOOssz62m3jBomrCUNpLPzXDuB2Kh7Cb/1b5VDZ6JbjzazudqVgg0rKgoV
LwldlNjr/8hC4tDswRmtSchiAdWAFn6y8qGSlqUu49LRj/kzEsLqNQ/leTWns3YUvWQaQ4
ohN7dlPQ6md52NYgalhNXfvipwKlLPwxcCoWvNxYzrdGArEU91mYhQwfFITLtxHI+NgAQ7
yUIrB2TsEQbXJpaW1wfRu+pJNuUUv9YqBJ4pRQOOxwJyL28j9C1yALqEhuRt9mzIUpViLp
jHIgEMlh+9M6nIne7sDq+BC2KR+TzuRyG6Vf8O31fC7Sb5pLUtBCvrIZO2Bk+bdVU8jrmV
LLLtrjkOVuPRMeyE8ufOmFwANOvRYwAAAAMBAAEAAAGAF8LidID6TXSHoQdK9B1iF1hofO
PIgAv47SOiT+b7nOzDoDlGocc/GBFPgmrwy72xJMDFWhj92onQaxXrF4dGq5pVABRXD4w/
cexwba/UrhB+G3LVxkbtZiGCdFmxYOSv+VrnfHLBRhyoXON8O859X144Ns2W6SSU6UDhay
JsHBxOQa+xvuwGMKGchhxAXI996vl6yasQ8K5EFRm++ag2K/cTDwhso19jNor9c6OU8W5H
LzuGLCLS2/pn17geoxs/GldgGu7l817sYCUQo9Pb4LcwLGgA9cP8VpVMh28VjuGuWnM8YZ
43FEh+Xmnm9hXkOCuI+FpViw4BND2BBka7myZZzSkwfJATOrpmbq2YYVaY1JZYS2FZ41KB
R1YnFGaGFsWW8uB7LyOB+yJ8E9JrO2JeOhvEjv8N6wdnDO6LPJODhW3k2OardM4pswIeHg
9mDT3Q2OmnXU2i8xkQAIqrxADLa0sO0qIQQEQwi8kiafWqHSCd2W6szUOYiGQG96OhAAAA
```

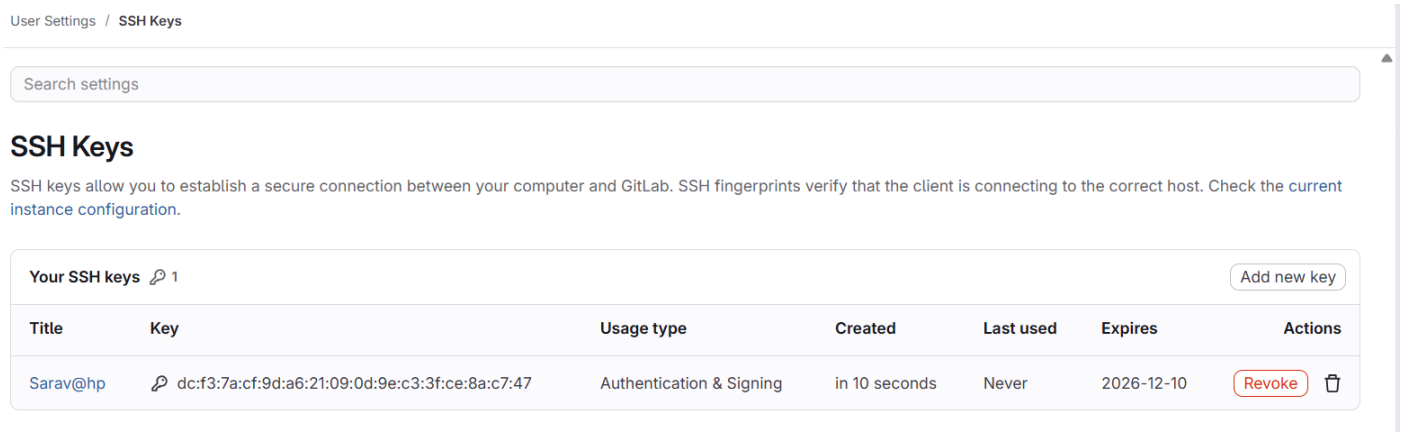
- Public key

```
Sarav@hp MINGW64 ~
$ cat ~/.ssh/id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQDME6q4f+SSUr7VVZ2OUzr7Hl4GZ959fQ7X8Go48TjlTsqIr5QetExg/f
kOtaEf19DYYxtWgBw1wadTuhFcF7ykHByeqfOx63qjT9XvGZ8KU+C7Aq4iJ2XYVL3b/vCQmQMFVIbMxJCDQ1wQrgtWjtLL
M+tpt4waJqwlDaSz81w7gdioewm/9W+VQ2eiW482s7nalYINKyoKFS8JXZTY6//IQuLQ7MEZrUnIYgHVgBZ+svKhkpalLu
PSOY/5MxLC6jUP5Xk1p7N2FL1kGkOKITe3ZTOOpnedjWIGpYTV374qcCpSz8MXAqFrzcWM63RgKxFPdZmIUMHxSEy7cRyP
jYAEO8lCKwdk7BEG1yaWltcHObvqSTblFL/WKgSeKUUDjscCci9vI/QtcgC6hIbkbfZsyFKVYi6YxyIBDJYfvTOpyJ3u7A
6vgQtikfk87kchulX/Dt9XwuOm+aS1LQQr6yGdNgZPm3VVPI65lSyy7a45NFbjOTHshPLnzphcADdLOWM= Sarav@hp
```

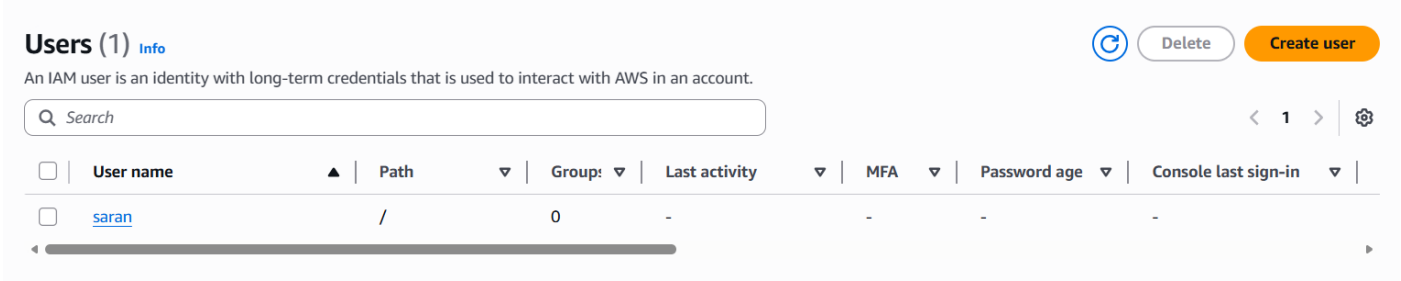
- Update the shh key into your gitlab account (past your public key)



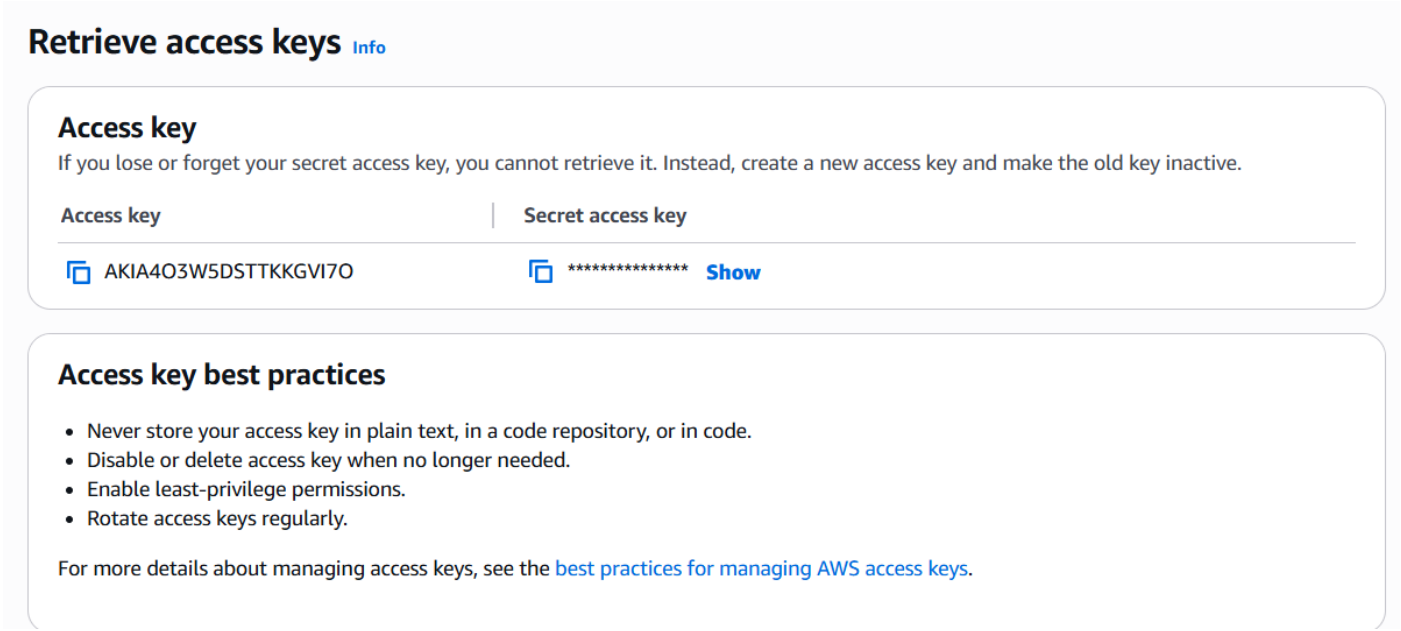
Result :



Create IAM user in your aws account



Generate the access key and secret access key in your IAM usar



Update the gitlab project variables into IAM access key and secret access key

Project variables

Variables can be accidentally exposed in a job log, or maliciously sent to a third party server. The masked variable feature can help reduce the risk of accidentally exposing variable values, but is not a guaranteed method to prevent malicious users from accessing variables. How can I make my variables more secure?

CI/CD Variables </> 2 Reveal values Add variable

Key ↑	Value	Environments	Actions
AWS_ACCESS_KEY_ID AWS_ACCESS_KEY_ID Masked	•••••	All (default)	
AWS_SECRET_ACCESS_KEY AWS_SECRET_ACCESS_KEY Masked	•••••	All (default)	