20. Deployment of Application to Cloud platform

Aim/Objective: The primary aim of deploying a full stack application into the cloud is to make your application accessible to users over the internet while leveraging the benefits of cloud computing.

Description:

The primary aim of deploying a full stack application into the cloud is to make your application accessible to users over the internet while leveraging the benefits of cloud computing.

Pre-Requisites:

Cloud account & full stack application

Pre-Lab:

1. **What is a cloud and its services?**

   A cloud refers to remote servers and data storage accessed over the internet. Cloud services are online resources and applications that provide computing power, storage, and various tools, allowing users to run applications and store data without the need for on-premises infrastructure.

2. **Differentiate between standalone and web-based application.**

A standalone application is installed and runs on a local device without internet connectivity, while a web-based application operates on remote servers accessible through a web browser and requires an internet connection for use.

3. **How can you update the application in cloud?**

To update an application in the cloud, you can deploy new code or configurations to cloud servers, ensuring seamless updates without user intervention. Cloud providers often offer tools and services for automated application updates, enabling efficient maintenance and scaling.

4. **How do you deploy the application in HEROKU?**

   To deploy an application on Heroku, you typically use the Heroku Command Line Interface (CLI) to create a new Heroku app and then push your application code and any necessary files to the Heroku remote repository using Git. Finally, you can scale and configure your app through the Heroku Dashboard or CLI.

5. **What Are the other ways(except HEROKU) to deploy the application in cloud?**

   Other ways to deploy applications in the cloud include using cloud providers like AWS, Azure, or Google Cloud, containerization platforms like Docker and Kubernetes, and platform-as-a-service (PaaS) offerings like Google App Engine or Microsoft Azure App Service.

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	<TO BE FILLED BY STUDENT>

In-Lab:

Exercise 1: Take the Full stack application with all modules. Note:(Business system is of your choice must contain UI and Database) deploy it into HEROKU cloud.

Exercise 2: Create a Banking Application and deploy it in GIT.

- **Procedure/Program:**

INLAB1

Prepare Your Application:

Make sure your application is fully functional and tested locally.
Ensure that your application can connect to a database. You may need to adjust the database configuration to work with Heroku.
Version Control:

Ensure your application code is under version control (e.g., Git).
Create a Heroku Account:

If you don't have one, sign up for a Heroku account at https://signup.heroku.com/.
Install Heroku CLI:

Download and install the Heroku Command Line Interface (CLI) on your local machine.
Log In to Heroku:

Open a terminal and run heroku login to log in to your Heroku account.
Initialize a Git Repository (if not already done):

If your code is not already in a Git repository, initialize one with git init.
Heroku App Creation:

Create a new Heroku app with heroku create.
Configure Buildpacks:

Set buildpacks for your application. For a full-stack app, you might need both Node.js and a database buildpack. You can configure this in your Heroku app settings or via the Heroku CLI.
Database Configuration:

Configure the database for your app. Heroku offers various database options, including Heroku Postgres. You can provision a database through the Heroku Dashboard or CLI and configure your application to use it.
Deploy Your Application:

Add and commit your code with Git, then push it to Heroku with git push heroku master (assuming you are deploying the master branch).
Open Your Application:

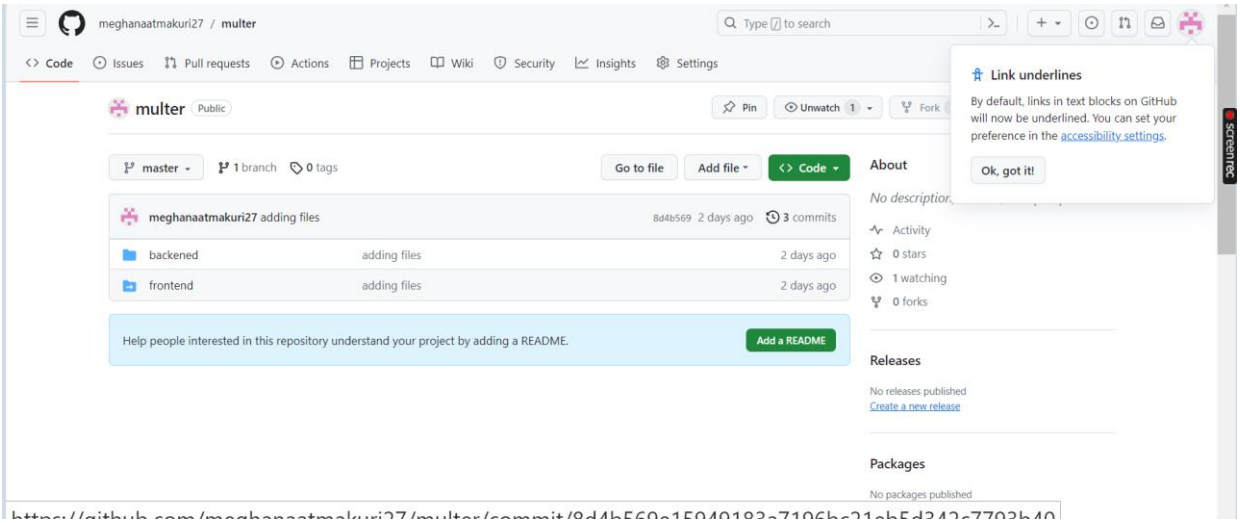
After deployment, Heroku will provide a URL for your application. You can open it in a web browser to access your deployed app.

Scale Your Application:

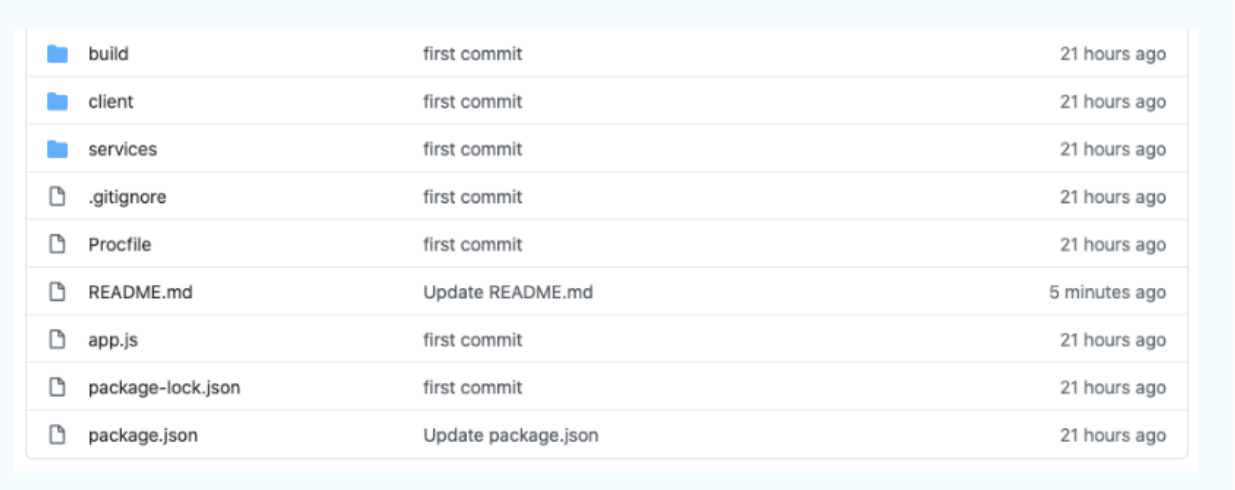
Depending on your needs, you can scale your application by adding more dynos (Heroku's containerized units of computing).
Maintenance and Monitoring:

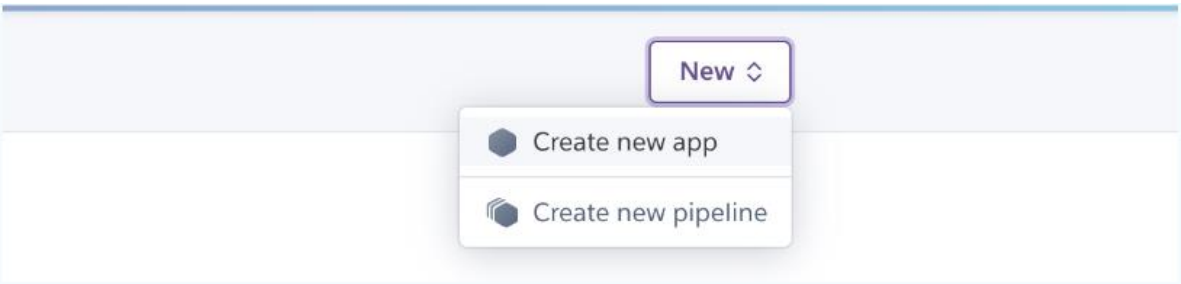
Continuously monitor your application on Heroku and perform maintenance tasks as needed.

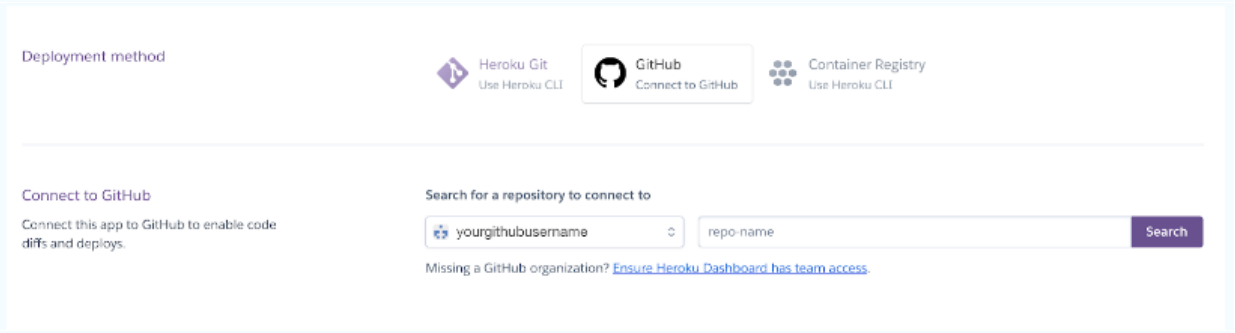
INLAB2

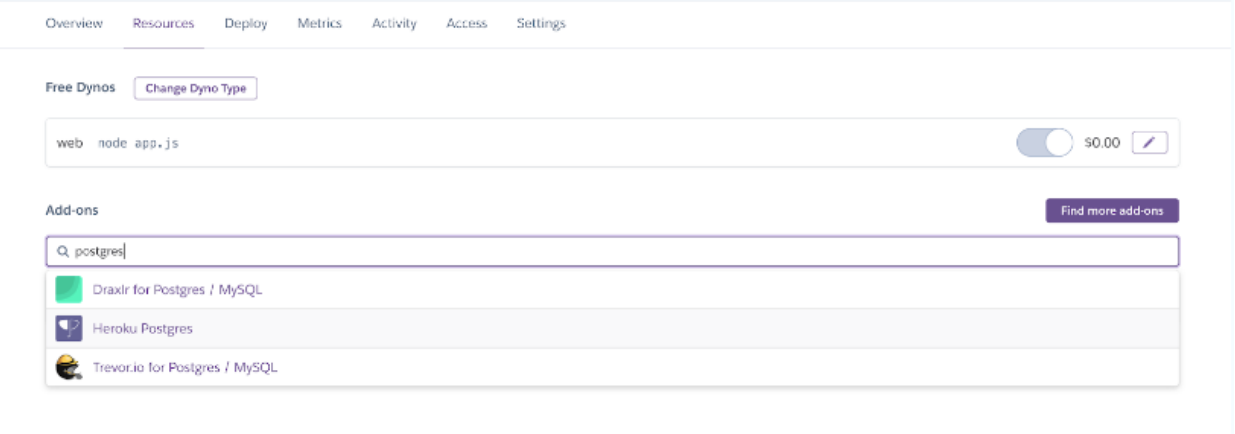


- **Data and Results:**
- **INLAB1**

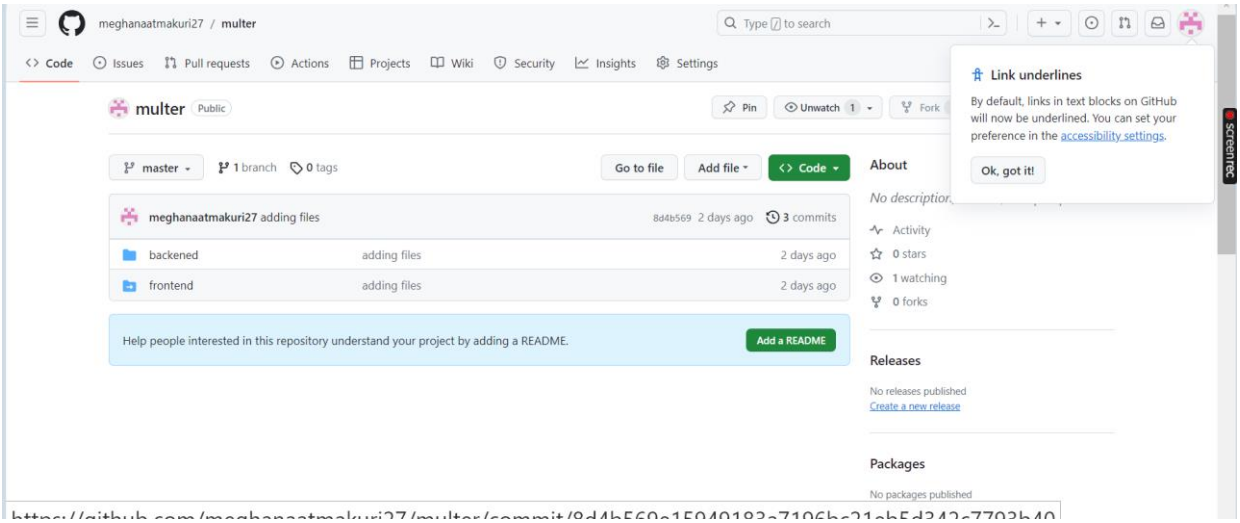








INLAB2



Sample VIVA-VOCE Questions (In-Lab):

1. **What is use of deploying the application into cloud?**

   Deploying applications in the cloud offers scalability, cost-efficiency, and accessibility, allowing users to access, scale, and manage applications from anywhere with an internet connection, reducing infrastructure and maintenance overhead.

2. **How can you provide the security for your application?**

   To enhance application security, implement practices like data encryption, user authentication, access controls, regular security assessments, and keeping software and libraries up to date. Employ security tools, employ secure coding practices, and follow relevant security standards and regulations.

3. **How to manage the application if the users are increased day by day?**

To manage application growth with increasing users, use cloud scalability features, auto-scaling, and load balancing to dynamically allocate resources as needed. Monitor performance, optimize code, and consider horizontal scaling by adding more servers or containers.

4. Explain the reliability of application in cloud?

The reliability of an application in the cloud is enhanced by redundant infrastructure, automated backups, and failover mechanisms, ensuring consistent availability and minimizing downtime. Cloud providers typically offer SLAs (Service Level Agreements) to guarantee uptime and resilience.

5. In how many ways to deploy the application in cloud?

Applications can be deployed in the cloud through various methods, including virtual machines (IaaS), containerization (e.g., Docker, Kubernetes), and platform-as-a-service (PaaS) offerings (e.g., Heroku, Google App Engine). Each approach offers different levels of control and management.

Evaluator Remark (if Any):	**Marks Secured:_____out of 50**
	Signature of the Evaluator with Date