LAB 3:

Implementation of deployment tools

Objective:

To understand the importance of deployment tools, with a particular focus on using Docker for packaging and deploying applications. Additionally , we were introduced to alternative deployment tools likeRender, Vercel and GitHub.

Tools used:

Docker - For containerizing the application

Node.js - To create a simple web application

Render - For simple and fast app hosting

Vercel - For frontend frameworks and serverless deployment

GitHub Pages -For hosting static websites

VS Code / Terminal - For development and command execution

OBSERVATION:

A) Create a simple Node.js Web App

1. Initialize the project:

```
mkdir docker-lab && cd docker-lab
npm init -y
npm install express
```

2. Create server.js

```javascript
const express = require('express');

const app = express();

const PORT = process.env.PORT || 3000;

app.get('/', (req, res) => res.send('Hello from Docker!'));

app.listen(PORT, () => console.log(`Server running on port ${PORT}`));
```

B) Create a docker file

```dockerfile
# Use an official Node.js image
FROM node:18

# Set working directory
WORKDIR /app

# Copy app files
COPY package*.json ./
RUN npm install
COPY . .

# Expose port and run app
EXPOSE 3000
CMD ["node", "server.js"]
```

C) Build and run docker image

```
docker build -t docker-lab .
docker run -p 3000:3000 docker-lab
```

Visit http://localhost:3000 to see the app running

D)Other deployment tool overview

1. Render

 Render offers easy backend and static site deployment with auto-deployment from GitHub ,steps:

- Connect your GitHub repo to render.com
- Choose Web Service or Static Site
- Configure build & start commands
- Deploy with a single click

2. Vercel

 Best for frontend projects like React, Next.js:

- Import project from GitHub
- Auto-deploy on every push

3.Github pages

Best for static HTML/CSS/JS projects:

- Push code to GitHub
- Go to repo settings -> Pages
- Select branch and folder
- GitHub will host it for free

CONCLUSION:

It taught about about how deployment is done using docker, and how it ensures

consistent environment through conterization. We also learned how platforms like render, vercel and github simplify modern web hosting.

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