Barq Systems – DevOps Internship Task Brief

Task Title:

Subnet Analysis and Visualization Tool

Overview:

build a small tool that analyzes and visualizes network data. This project will test your understanding of IP subnetting, scripting, containerization, and basic network fundamentals.

You will be given a dataset containing IP addresses and subnet masks. Your goal is to write a script that processes this data, performs subnet calculations, generates a report, and visualizes the results.

Objectives:

1. Read input data from a provided Excel file (ip_data.xlsx)
2. For each row, calculate:
    - CIDR notation
    - Network address
    - Broadcast address
    - Number of usable hosts
3. Group IPs by subnet/CIDR
4. Export a summary report (CSV or JSON)
5. Create a bar chart showing the number of hosts per subnet
6. Containerize your solution using Docker
7. Answer a set of analysis questions in a separate file

Deliverables:

Please submit a **GitHub repository** containing the following:

- subnet_analyzer.py or subnet_analyzer.sh – your main script

- Dockerfile – container definition
- ip_data.xlsx – input dataset (use the one provided)
- subnet_report.csv or .json – generated output
- visualize.py – optional script to generate graphs (matplotlib, etc.)
- network_plot.png – chart output
- report.md – answers to the analysis questions
- README.md – clear instructions on how to run the project (both locally and with Docker)

Analysis Questions (report.md):

1. Which subnet has the most hosts?
2. Are there any overlapping subnets? If yes, which ones?
3. What is the smallest and largest subnet in terms of address space?
4. Suggest a subnetting strategy that could reduce wasted IPs in this network.

Tech Stack:

- Python 3 or Bash
- Docker
- Libraries: pandas, ipaddress, matplotlib (optional)
- Tools: Any others as needed, but document them in the README

Expected Folder Structure:

barq-devops-subnet-task/

├── Dockerfile

├── ip_data.xlsx

├── subnet_analyzer.py

├── visualize.py (optional)

├── subnet_report.csv / .json

├── network_plot.png (optional)

├── report.md

└── README.md

Submission Guidelines:

- Push your complete project to a **public or private GitHub repository**
- Share the repo link by the submission deadline
- Include a short video (2–5 min) explaining your solution

Rules & Expectations:

- **Do not copy code blindly from AI tools or the internet.**
- You may use online resources for reference, but your implementation must be original.

Good luck! We look forward to seeing your work.