Bangladesh National AI Hackathon 2025

Problem Statement:

AI-Powered Early Warning System for Dengue Outbreak Prediction in Bangladesh

Background:

Dengue fever has become a critical and escalating public health concern in Bangladesh, especially during the monsoon season. In 2023 alone, over **300,000** cases were reported—an all-time high—overwhelming the country's healthcare system. The current healthcare response is **mostly reactive**, with interventions happening **after** outbreaks occur. This leads to severe consequences, particularly in densely populated slums and underserved areas.

Key challenges in controlling dengue include:

- Lack of timely warnings
- Delayed access to patient data
- Inability to analyze early signals on social media
- Failure to communicate alerts to at-risk communities

The Challenge:

Design an **AI-powered intelligent system** capable of the following:

1. Multisource Data Collection & Analysis:

- Weather data (rainfall, temperature, humidity)
- Historical dengue case records
- Hospital admission reports

- Social media posts (especially in Bengali) mentioning symptoms or dengue

2. Predict Outbreaks in Advance:

- Forecast dengue-prone zones **2–3 weeks ahead** using AI models
- Ensure **at least 80% prediction accuracy**

3. Visualization & Alert Delivery:

- Display high-risk zones on a **user-friendly dashboard**
- Auto-generate reports/emails for **health authorities & local administration**
- Alert the local population via **SMS or voice messages**

4. Scalability & Privacy:

- Ensure **data privacy**, especially for individuals
- Build infrastructure that works across **entire Bangladesh**
- Design the system to be adaptable for other vector-borne diseases (e.g., Chikungunya)

Expected Outcomes:

- Reduce dengue outbreak intensity by **40–60%**
- Enable **timely intervention** in high-risk zones
- Increase **public awareness**
- Promote **technological adoption** in Bangladesh's public health sector

Technical Considerations:

- Develop a **Bengali NLP model** capable of analyzing social media content (Facebook/Twitter/forums)
- Use APIs, crowdsourced data, and weather feeds for input
- Ensure **80% or higher model accuracy** through back-testing
- Deliver alerts within **24 hours** of detection
- Ensure the system is **scalable and modular**

Success Metrics:

- ≥80% accurate high-risk zone predictions
- Average alert delivery time ≤24 hours
- Noticeable reduction in reported cases in pilot areas
- Integration into at least **2 City Corporations** in Year 1

Social Impact Potential:

This AI solution can help **control the spread of dengue**, **save lives**, and **strengthen Bangladesh's tech-driven public health systems**. In the long term, the model can be adapted for other pandemics or climate-related disasters.

📌 **Note:**

This challenge is for **idea submission only**. Implementation or prototyping is **not required**. Participants will be evaluated based on the **depth of thought**, **technological feasibility**, and their **understanding of the real-world problem**.