Team Kingfisher

72-Hour Hackathon Experience

Date : 12-Dec-2024 to 15-Dec-2024

Team members

Anand Sai Lattala

Nandan Chilukuri

GitHub Repository --> Link

Agenda

- Introduction
- Day 1: Idea Selection & Presentation
- Day 2: Mid-Hackathon Activities & Code Explanation
- Day 3: Coding and Final Optimal Solution
- Collaboration & Teamwork
- Lessons Learned
- Closing Thoughts

Introduction

Objective: Design a memory-efficient probabilistic data structure for real-time event tracking.

Core Goals:-

- **Sub-linear space complexity**
- **Mergeable properties for distributed systems**
- **Accurate percentile-based insights**

Day 1 - Idea Selection and Presentation

Activities:

- **Brainstormed and finalized our project idea: Enhanced Count-Min Sketch for Real-Time Event Tracking.**
- **Created the initial project roadmap.**

Submission:

- **Submitted the idea presentation.**
- **Delivered an explanation of the concept to the judges.**

Final Score after Day-1: 30

Position: 7th

Day 2 – Emoji Activity & Code Explanation

Mid-Hackathon Activity:

- Created an emoji representation of our experience: "[Include Emoji Description or Drawing] (e.g., teamwork and excitement emoji)."
- Shared insights and challenges faced during the first half of hackathon.

Night Session:

- Explained our project code structure to the judges.
- Highlighted key features:
  - Sub-linear memory efficiency.
  - Real-time percentile queries.
  - Mergeable probabilistic data structures.

Final Score after Day-2: 90

Position: 5th

Day 3 - Full Coding and Optimization

- **Finalized the Code:**
  - Integrated error margin calculations and optimized hash functions.
  - Enhanced mergeability features for distributed environments.
  - Added percentile-based queries.
- **Testing and Debugging:**
  - Tested with large-scale datasets for accuracy and performance.
  - Ensured error margin ≤ 1% as per constraints.
- **Documentation:**
  - Completed README.md with clear project instructions.
  - Created a submission folder with the final presentation and code.

Collaboration & Teamwork

Roles and Contributions:

- **Anand : Algorithm design, hash function optimization, and presentation delivery.**
- **Nandan: Implementation, debugging, and Testing.**

Tools Used:

- **Python, NumPy, mmh3**
- **GitHub for version control**
- **Google Colab for Execution.**

Lessons Learned

Technical:

- **Deepened understanding of probabilistic data structures.**
- **Enhanced skills in Python and memory-efficient coding.**

Teamwork:

- **Importance of clear communication and task delegation.**
- **Adapting to feedback and improving iteratively.**

Hackathon Environment:

- **Delivering the requirements within time.**
- **Balancing creativity with practical implementation.**

Closing Thoughts

- Grateful for the opportunity to participate and learn.
- Excited to apply the skills gained to future projects.
- Further optimization of our Enhanced Count-Min Sketch.
- Explore new ways to scale the project in distributed systems.

Thanks to the Mentor (VVS Basanth Pedapati),GAAC and teammates for their support.

Thank You!

-Team Kingfisher