DSA Assignment 2

Tips and Tricks

Tan Thor Jen

Undo and Redo Management

- Keep a list of all the changes, in order
- Each change item will track:
  - EmployeeRequest state before the change, used for Undo
  - EmployeeRequest state after the change, used for Redo
- When we undo an item, we transfer it to the Redo stack
- When we make any normal changes, we clear out the Redo stack

Enrollment history

Do not use Linked Lists

- Linked lists don't make sense
  - Poor performance
  - Can't be easily saved
- Easiest solution is to add the date when any enrollment change is made

Data Encryption

Key management is the important bit

- There are two important facets to data encryption - encryption algorithm and key management
- Algorithm: AES-256
- Key management:
  - A way to setup the primary encryption key securely
  - Use DPAPI on Windows to encrypt/decrypt the encryption key

Real-Time Analytics Dashboard

Web Page to pull live data

- Employee Management System runs a server that can deliver data to a web page (Flask)
- Web page will refresh every second to fetch the latest analytics data and display it
- +1 if you use a websocket to trigger web page refresh

GenAI

Choices

- Free online providers (use small models 2B/4B):
  - https://huggingface.co/docs/inference-providers/en/index
  - https://www.together.ai/models/gemma-3n-e4b-it
- OR Run a small model locally -- Phi-3 Mini needs about 4GB of RAM. ollama is probably the easiest solution
- Prompt the AI to suggest programmes based on the employee's previous programmes.

Biometric Login

Face recognition

- Use OpenCV
- Need a Face Enrollment system

Don't code in the dark
AI will light the way