A. Design RUST API with CRUD features to an EMPLOYEE DB (In progress – 24/03/2025)

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| JWT authentication setup | |
| 1. JWT secret key generated using <https://jwtsecret.com/generate>    * Secret length: 64-Byte    * Secret key is set using Windows 11 Environment Variables setting for current user.    * The auth/jwt.rs code get’s the secret key from the Environment Variables. 2. JWT token generated using <https://jwt.io/>    * Set Algorithm to HS256.    * Copy secret key to section “VERIFY SIGNATURE”.    * Fill section “PAYLOAD:DATA” with:      + “sub”: {User\_ID}      + “exp”: {UNIX formatted timestamp} (Set to 1 hour from current time) | Generating JWT secret key    Set Environment Variable for current user    Get secret key from Environment Variable instead of hardcoding.    Generated Encoded token authentication to be used by user. Expires 1 hour from creation time for this setting. |
| Test run | |
| Testing JWT token authentication.  Test GET employees with emp\_no = 10001   * If the user uses the correct token authentication, the crul command works normally. Otherwise, the system returns “Unauthorized” error. * Once the token expires, the system will return “Token expired” error. | Obtained employee 10001    Unauthorized error due to wrong token.    Token expired error. |
| Inplemented rate limiting   * Created table, “rate\_limits” with columns of:   + username: primary identifier   + remaining\_requests: tracks API request limit of the user. * When a new user runs API request, the user’s username will be added to the table, and a limit of 10 request are tracked with “remaining\_requests” column. | Table structure for “rate\_limits” |
| Testing rate limiting up to 10 requests  Test GET employees with emp\_no = 10001   * For new users, after running the CRUL command, the rate\_limits table will be filled with the user’s username and given remaining API request (set to 10). * For every API request, the “remaining\_request” value decrements by 1. * Once the “remaining\_requests” reaches 0, the command will not work and will return “Rate limit exceeded” error. | Obtained employee 10001 on first API request.    Data created after running the command    “remaining\_request” value decrements by 1 until 0.      Rate limit exeeded error. |