Project Report

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| Product Name | Advanced Certificate in Web Development |
| Qualification Name (NICF) | NICF-Advanced Certificate in Infocomm Technology (Software & Applications) |
| Product Name | Database Design and Implementation |
| Module Name (NICF) | ITSF-Database Design and Implementation |

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| --- | --- | --- | --- |
| Student name | | Assessor name | |
| Joshua Ho Gwok Hin | |  | |
| Date issued | Completion date | | Submitted on |
| 15 Feb 2022 | 12 March 2022 | | 12 March 2022 |
|  | |  | |
| Project title | Design, Implement, Test & Document Community Portal Database. | | |

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| Learner declaration |
| I certify that the work submitted for this assignment is my own and research sources are fully acknowledged.    Student signature: Date: 12 March 2022 |

Content

1. Project background
2. Project Objectives
3. Database Requirement Specifications
4. Task 1 – Database requirements specification document.
5. Task 2 – Conceptual & Logical database design with ER Diagrams
6. Task 3 – Database dictionary with tables, fields & data types
7. Task 4 – Implemented MySQL database, screen capture of tables
8. Task 5 – Index creation & backup script to maintain the database
9. Task 6 – SQL Queries & CSV import
10. **Project background**

ABC Jobs Pte Ltd is looking for a database design solution for their community jobs portal. This community portal will have two main groups of users, namely the software engineers and web-app administrators.

The design of this database has to be in tandem with the business needs and goals of ABC Jobs Community Portal.

1. **Project Objectives**

The main objectives of this project is to **plan**, **design**, **build** and validate that the database is capable of handling operations that may be performed by target user groups and management.

The two main groups of target users are software engineers and web-app administrators. The overall design of the database allows functional manipulation of records for target users and the management. Functions such as updating personal particulars, posting a job listing, applying for jobs, searching & connecting with other users, and bulk email are put into consideration in the planning phase of the database design. The planning of database can somewhat be represented by an **Entity Relationship Diagram** and **Data Dictionary**.

Next, **entities** and **attributes** in the **ERD** are then converted/translated into database/schema **tables** and **columns** respectively using **MySQL Workbench**.

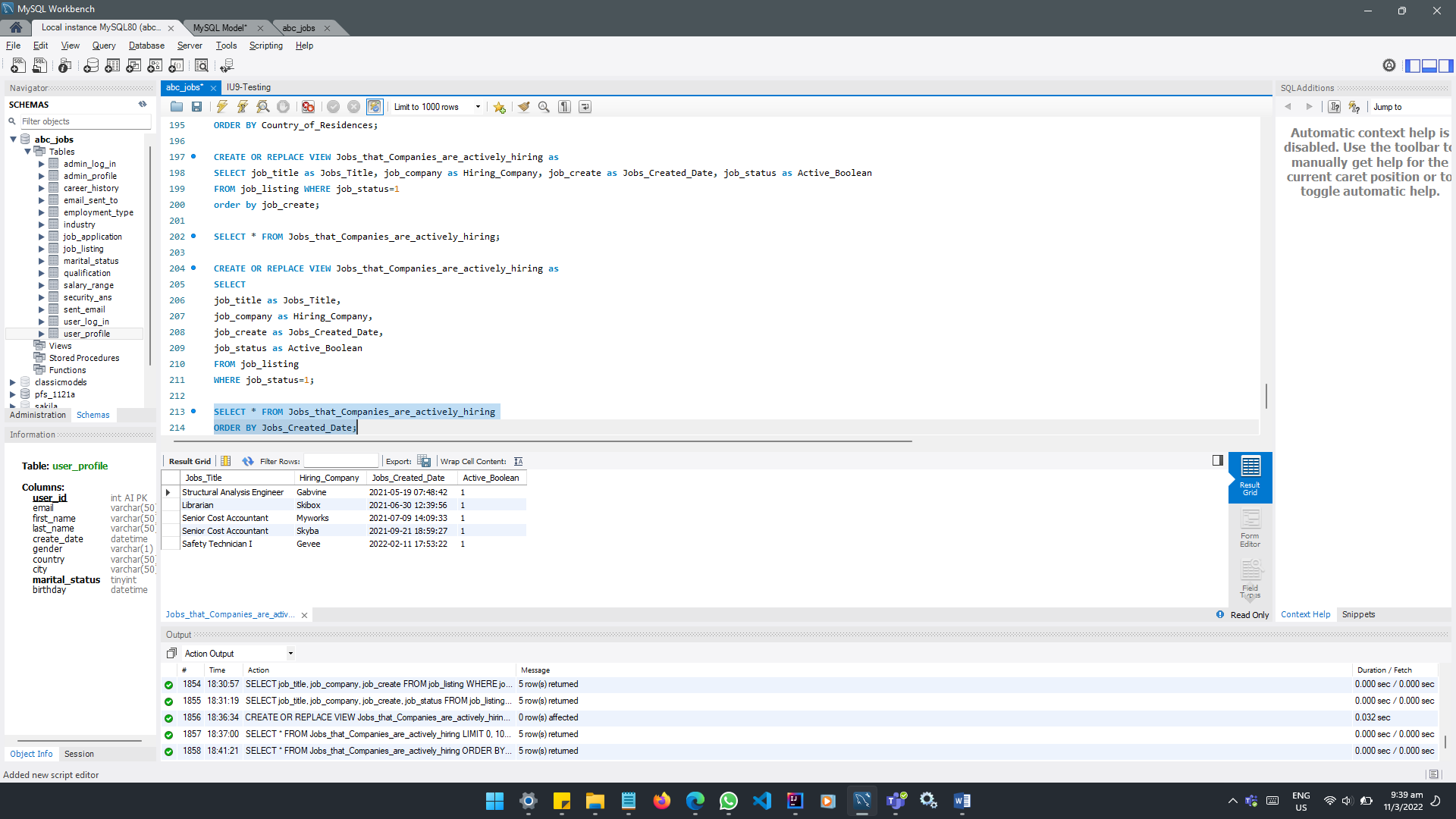
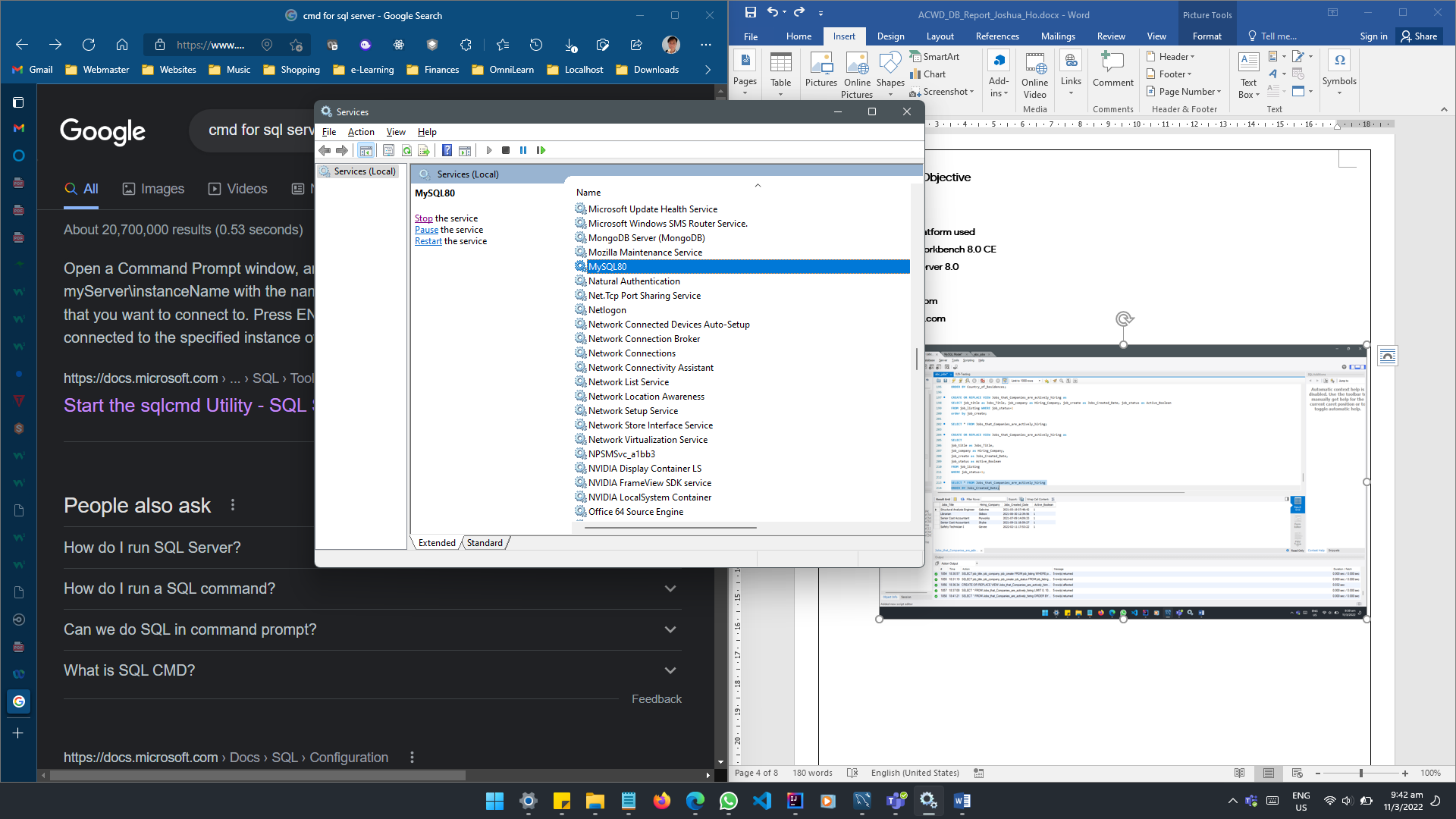
Mock data generated with **Mockaroo.com** were then imported to some tables to simulate a working model. This can help identify some relationship errors that may present during the design & implementation stage.

An **automated backup** were also included.

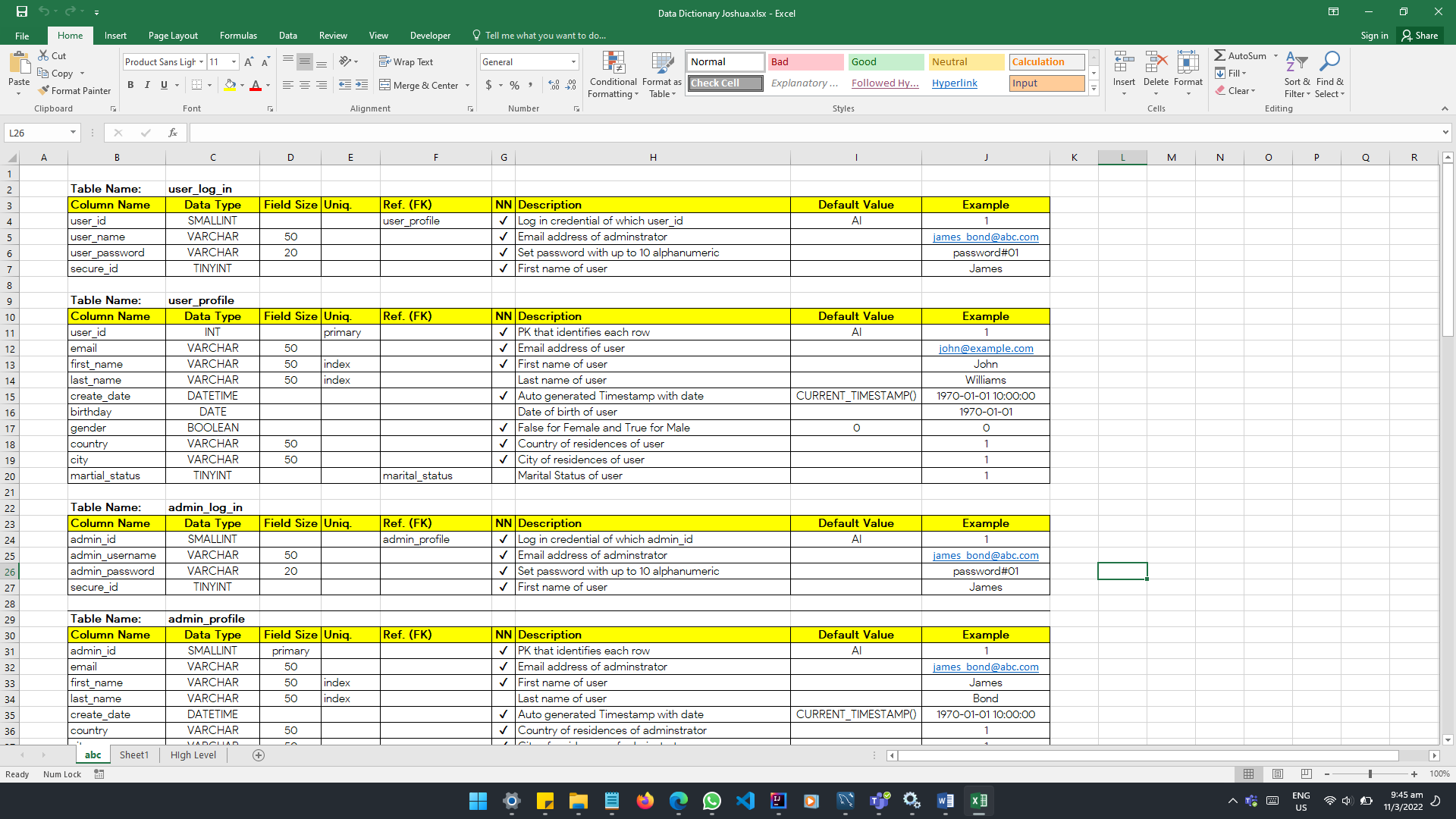
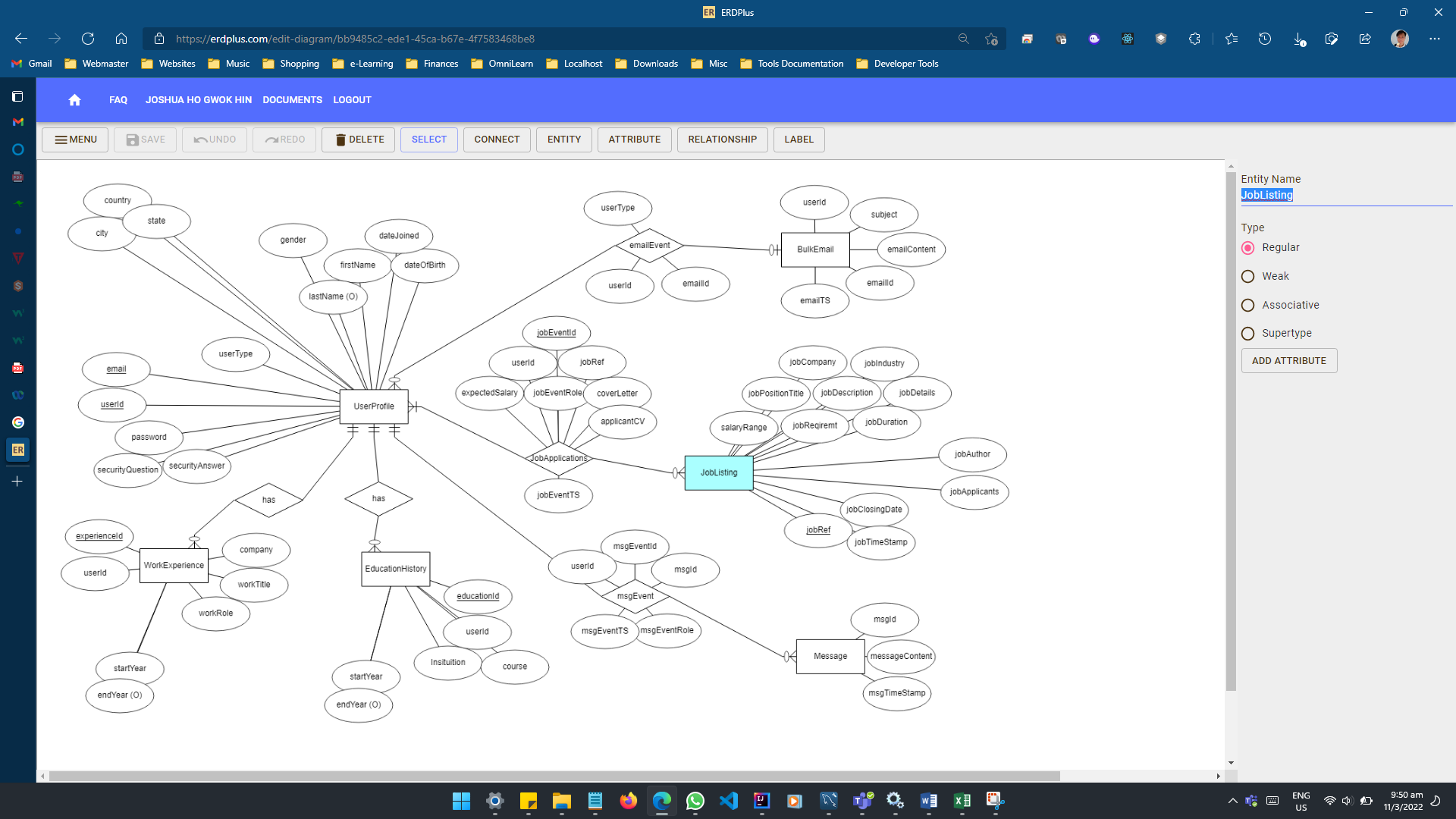
1. **Database Requirement Specifications**

Tools & platform used

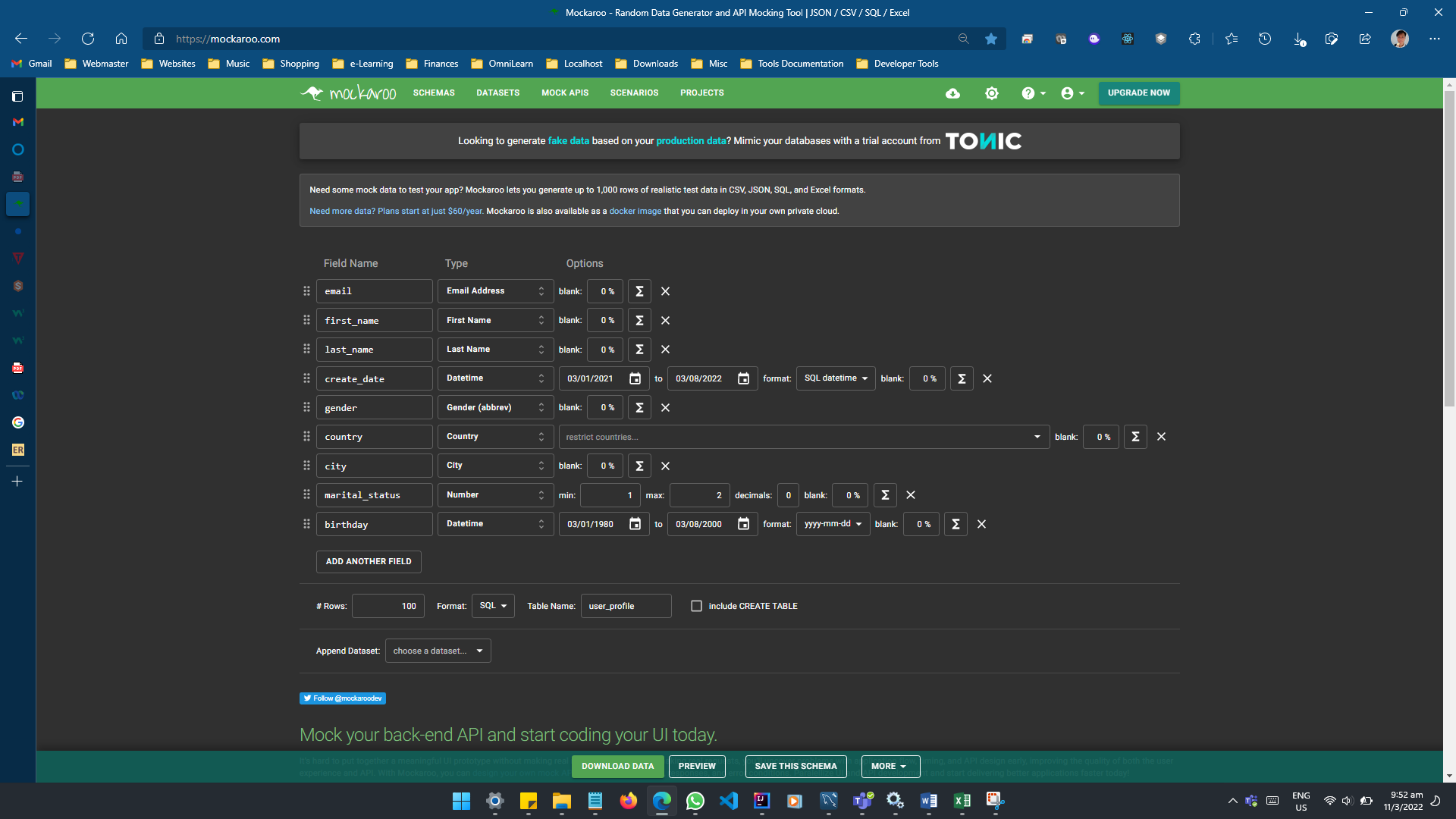
MySQL Workbench 8.0 CE MySQL Server 8.0

MS Excel ERDPlus.com

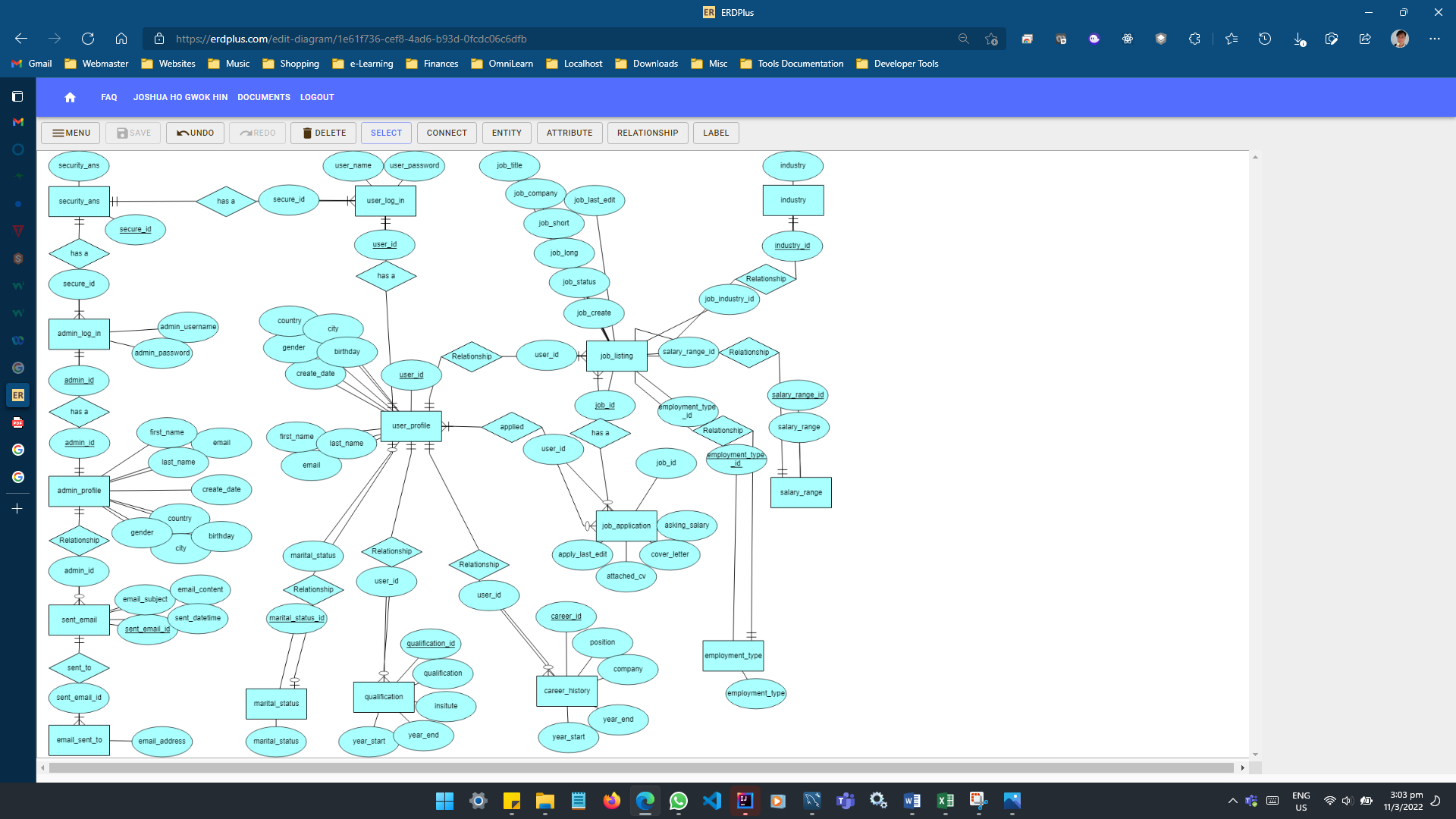
Mockaroo.com



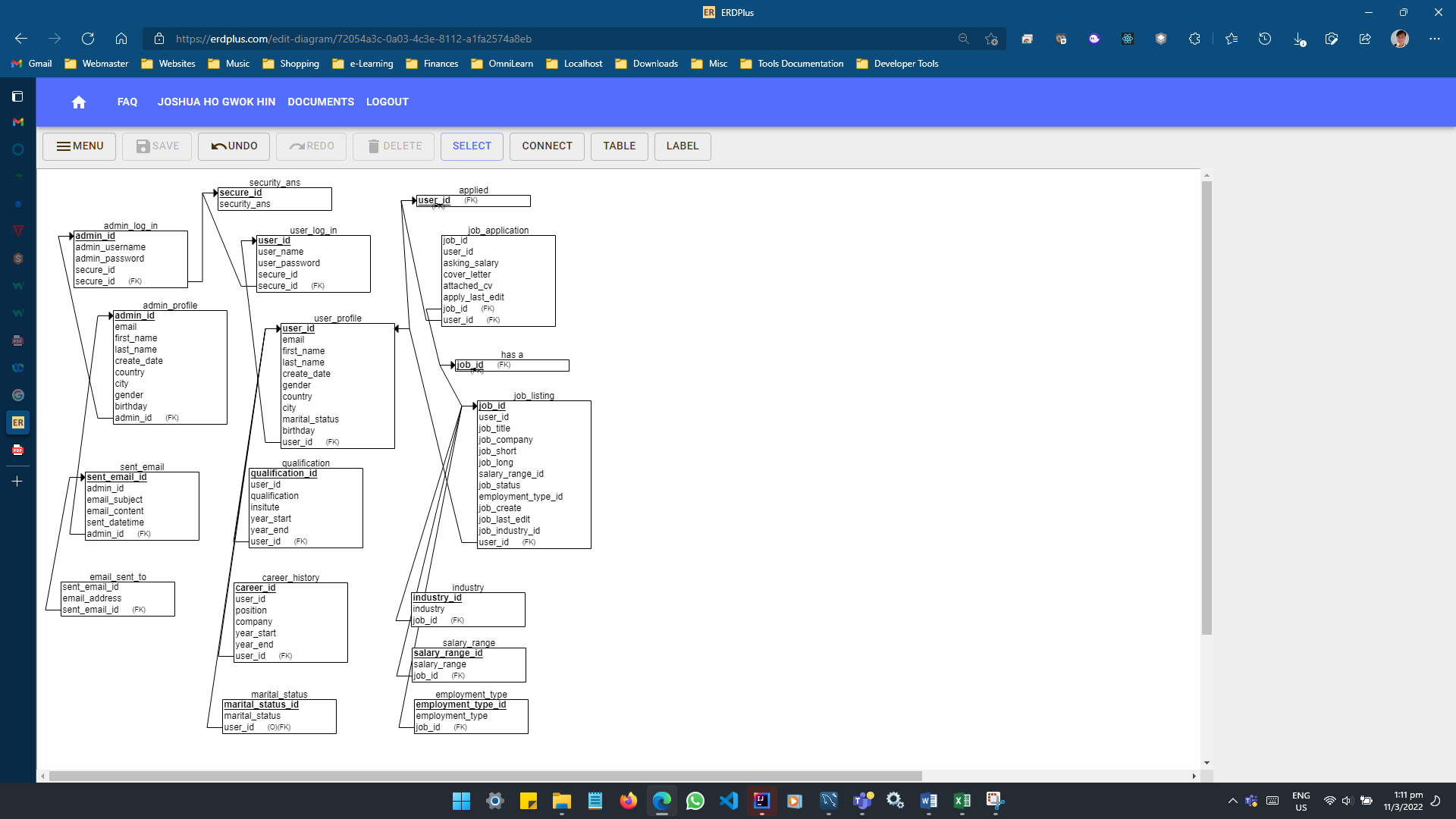
1. **Task 1 – Database requirements specification document.**

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| --- | --- | --- | --- |
| No | Entities | Entity Description | Functions/Pages |
| 1 | admin\_profile | Contains general information of administrators. | Admin Home Page |
| 2 | admin\_log\_in | Administrator log in credentials | Admin Log in Page |
| 3 | user\_profile | Contains private and public information of unique users indexed by user\_id. Example: First, Last, User Names, log in details, Job title & description, Work, education, award history, demographical classification in age, gender, location. | * Login Page Registration Page, Confirmation Common Header Common User Dashboard Profile Page Update Profile, Confirmation Search user(s) page   Home Page (Common user) Home Page (Administrators) All other pages with common header and user dashboard. |
| 4 | user\_log\_in | User log in credentials | * Log in Page * Registration Page, Confirmation * Update Profile, Confirmation * Forget Password   Reset Password |
| 5 | career\_history | Records of Employment History | Profile Page Search user(s) page |
| 6 | qualification | Records of Education | Profile Page Search user(s) page |
| 7 | job\_listing | Master Table for job listings where actual job title, details, requirements are. | Search Job page Search Job listings Job application page, Confirmation Create Job page, Confirmation |
| 8 | job\_application | Transactional Table to record job authorship and candidate applications. Events recorded with time stamp. | Job application page, Confirmation Create Job page, Confirmation |
| 9 | security\_ans | Security Answer for changing password | Forget Password page |
| 10 | marital\_status | Marital Status of users. | Profile page |
| 11 | industry | Industry of Job Listings | Job Listing page Job application page Search job list |
| 12 | salary range | Expected salary of Job Listings | Job Listing page Job application page Search job list |
| 13 | employment\_type | Type of employment Temp, Contract, Full Time, and etc. | Job Listing page Job application page Search job list |
| 14 | sent\_email | Content and subject of sent email | Admin home page |
| 15 | email\_sent\_to | Identify the intended recipients of bulk email | Email success page |

1. **Task 2 – Conceptual & Logical database design with ER Diagrams**



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| RELATIONSHIP TABLE | | | | |
| S/N | Table | Primary Key | Reference Table | Foreign Key |
| 1 | admin\_log\_in | admin\_id | admin\_profile security\_ans | admin\_id secure\_id |
| 2 | admin\_profile | admin\_id |  |  |
| 3 | career\_history | career\_id | user\_profile | user\_id |
| 4 | email\_sent\_to |  | sent\_email | sent\_email\_id |
| 5 | employment\_type | employment\_type\_id |  |  |
| 6 | industry | industry\_id |  |  |
| 7 | job\_application | job\_id  user\_id | job\_listing  user\_profile | job\_id  user\_id |
| 8 | job\_listing | job\_id | user\_profile  industry  salary\_range  employment\_type | user\_id  industy\_id  salary\_range\_id  employment\_type\_id |
| 9 | marital\_status | marital\_status\_id |  |  |
| 10 | qualification | qualification\_id | user\_profile | user\_id |
| 11 | salary\_range | salary\_range\_id |  |  |
| 12 | sent\_email | sent\_email\_id | admin\_profile | admin\_id |
| 13 | user\_log\_in | user\_id | user\_profile  security\_ans | user\_id  secure\_id |
| 14 | security\_ans | secure\_id |  |  |
| 15 | user\_profile | user\_id | marital\_status | marital\_status\_id |

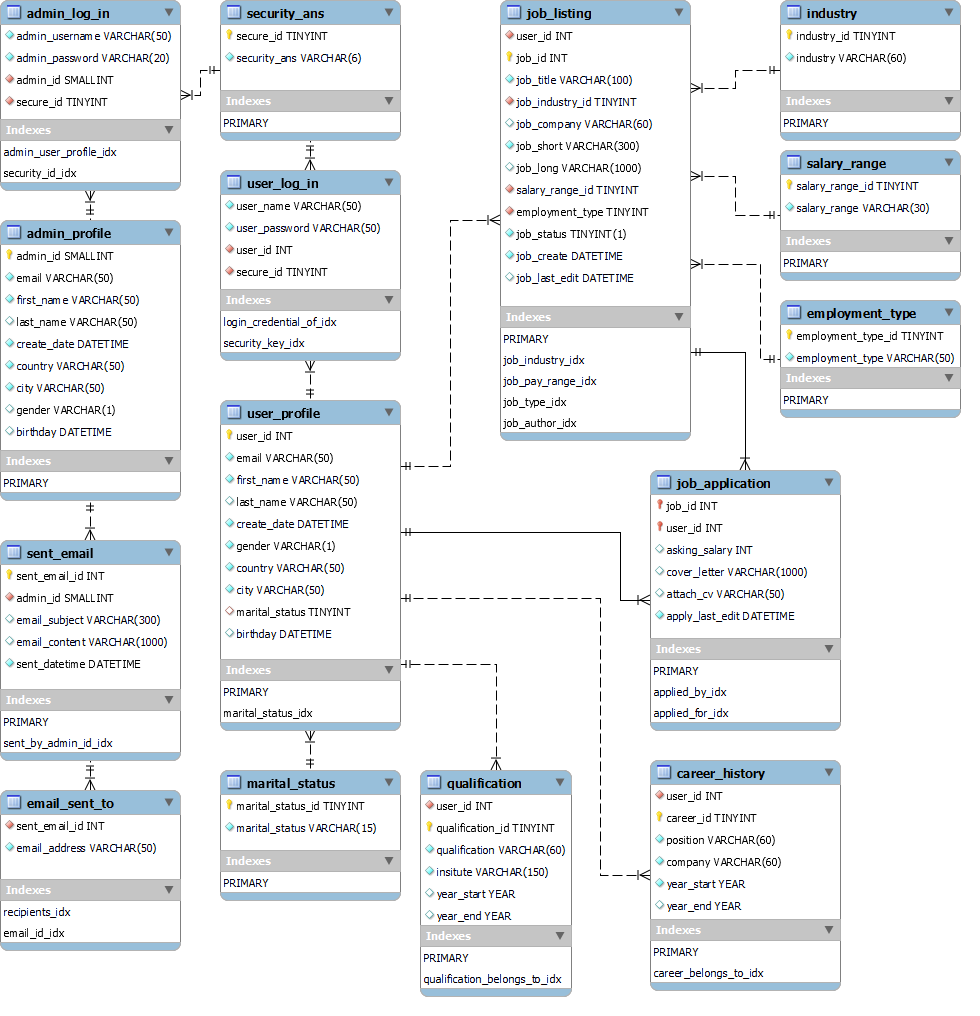


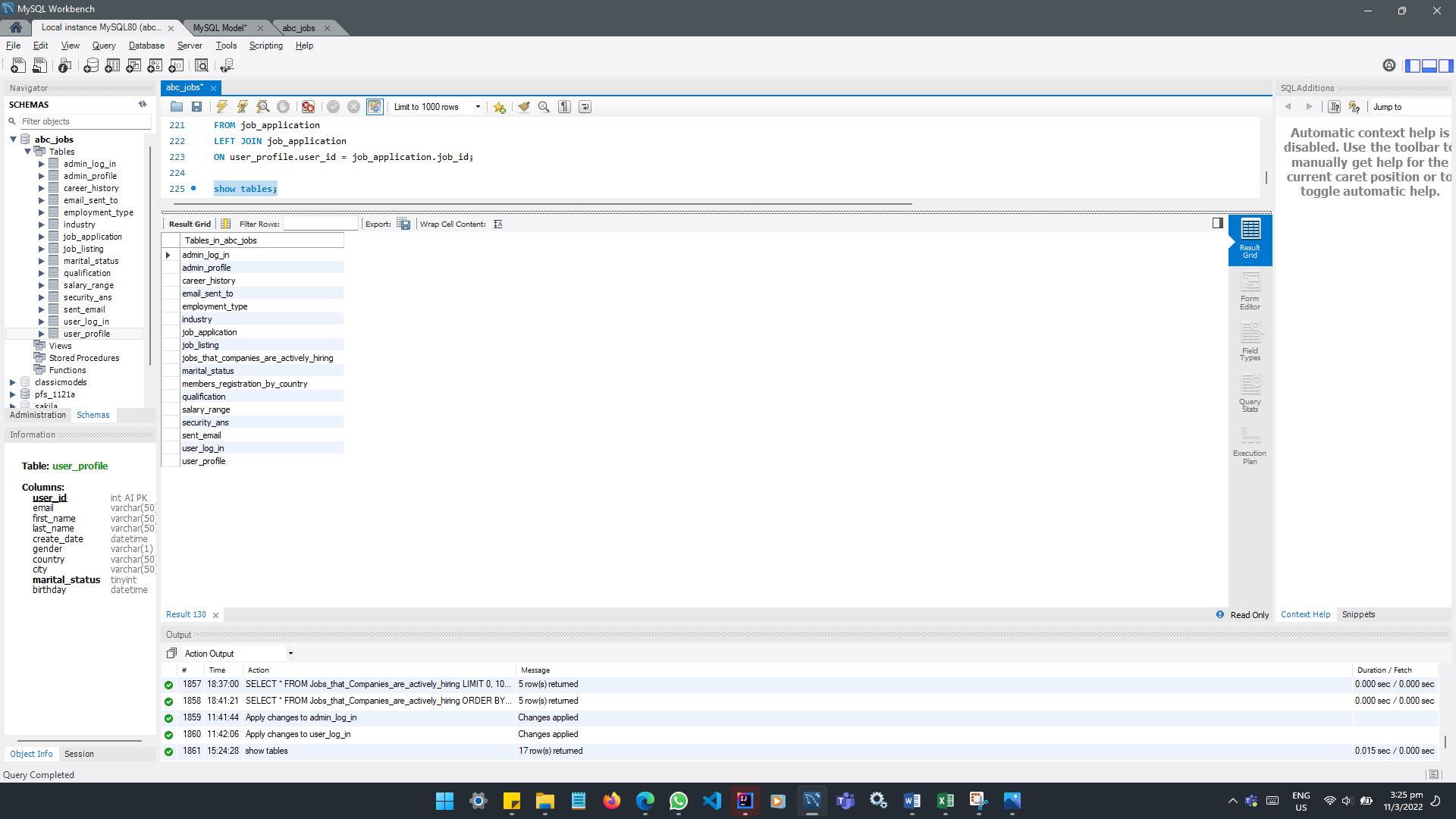
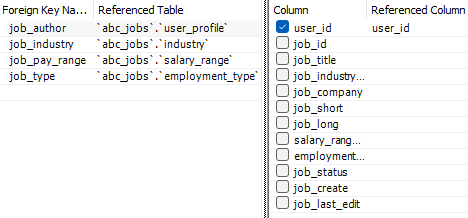
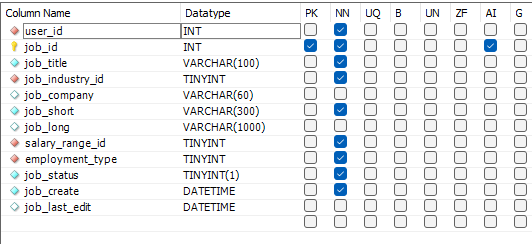
1. **Task 3 – Database dictionary with tables, fields & data types**

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1. **Task 4 – Implemented MySQL database, screen capture of tables**



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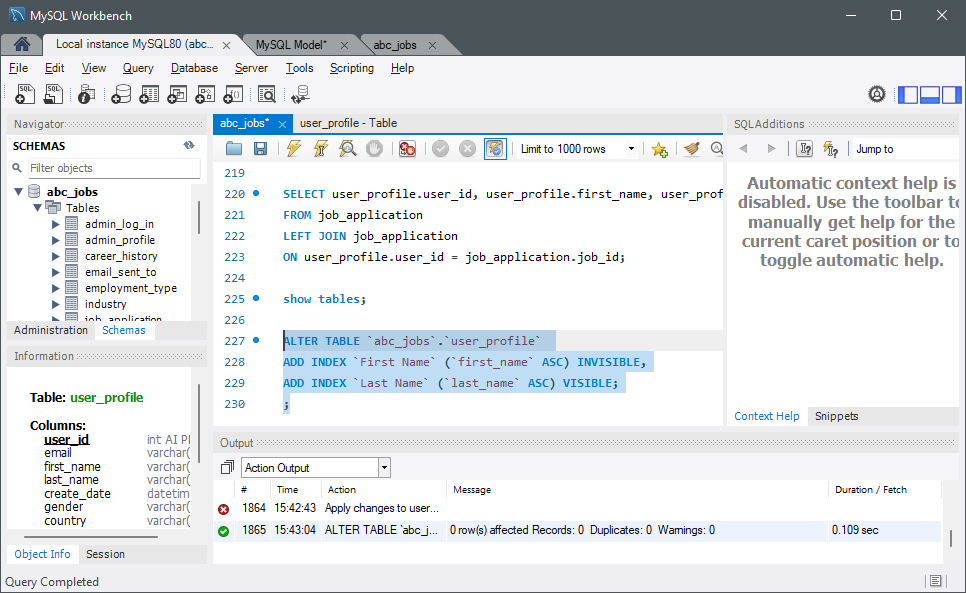
1. **Task 5 – Index creation & backup script to maintain the database**

A. Index creation script:

ALTER TABLE `abc\_jobs`.`user\_profile`

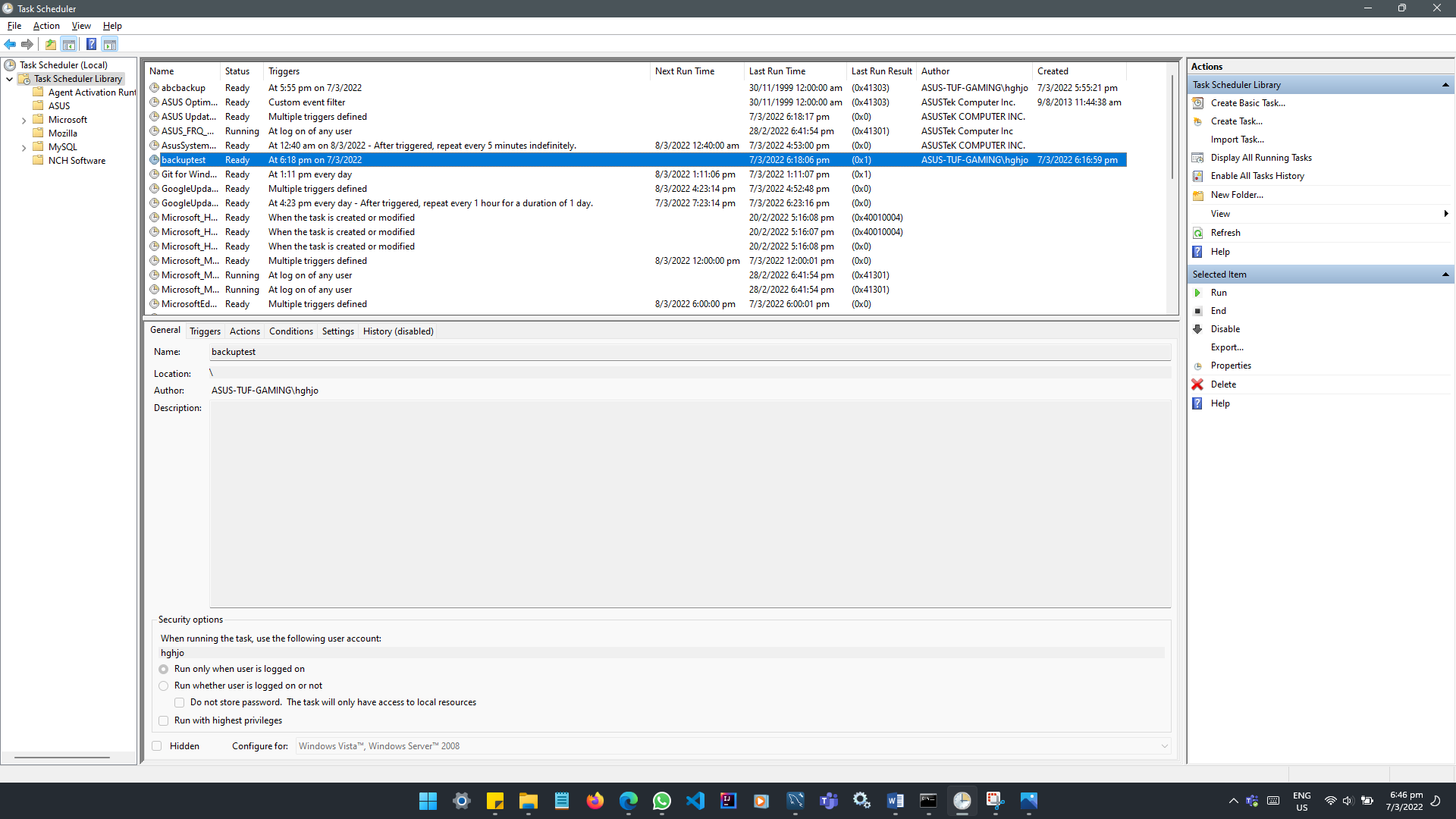
ADD INDEX `First Name` (`first\_name` ASC) INVISIBLE,

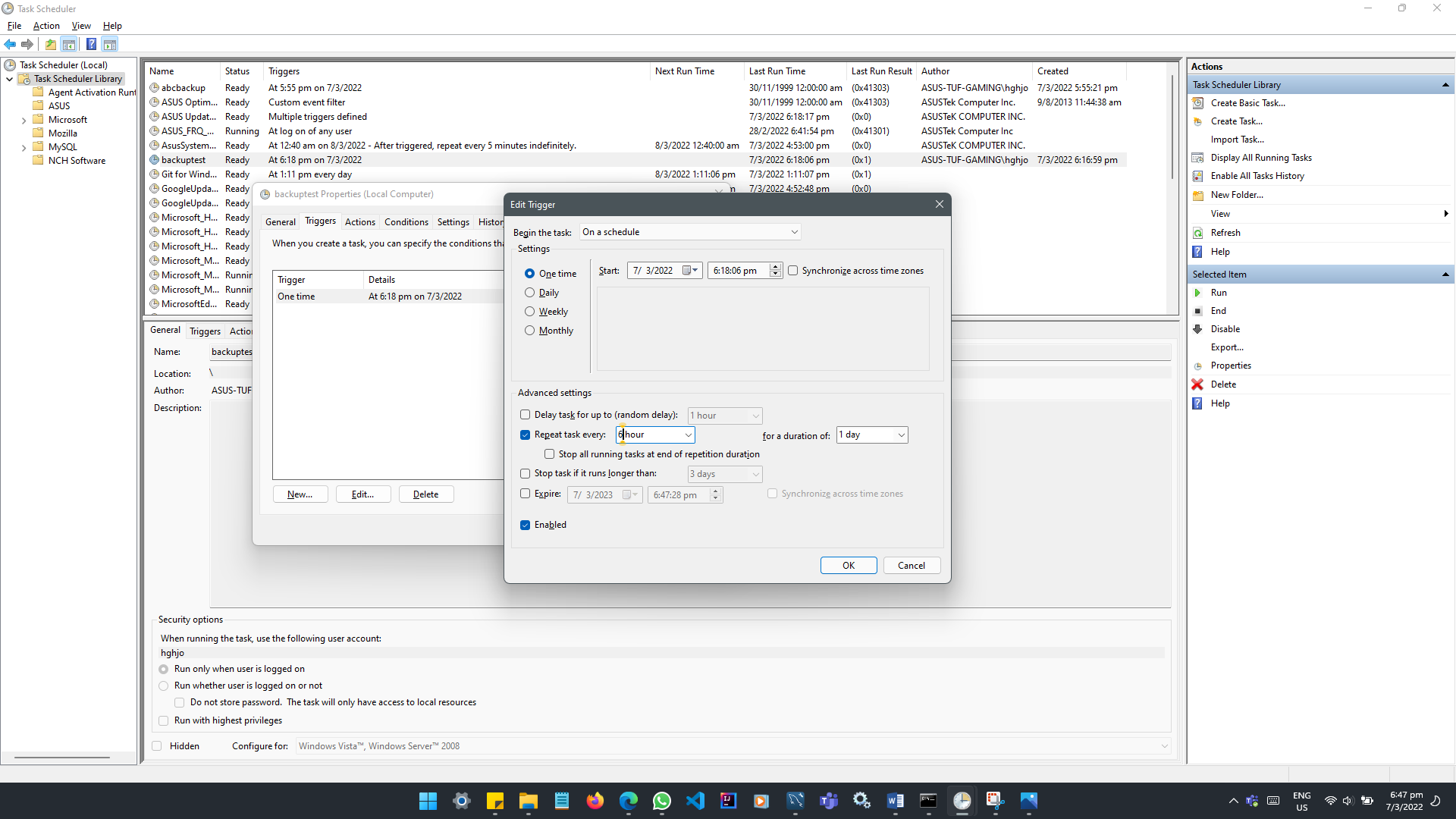
ADD INDEX `Last Name` (`last\_name` ASC) VISIBLE;

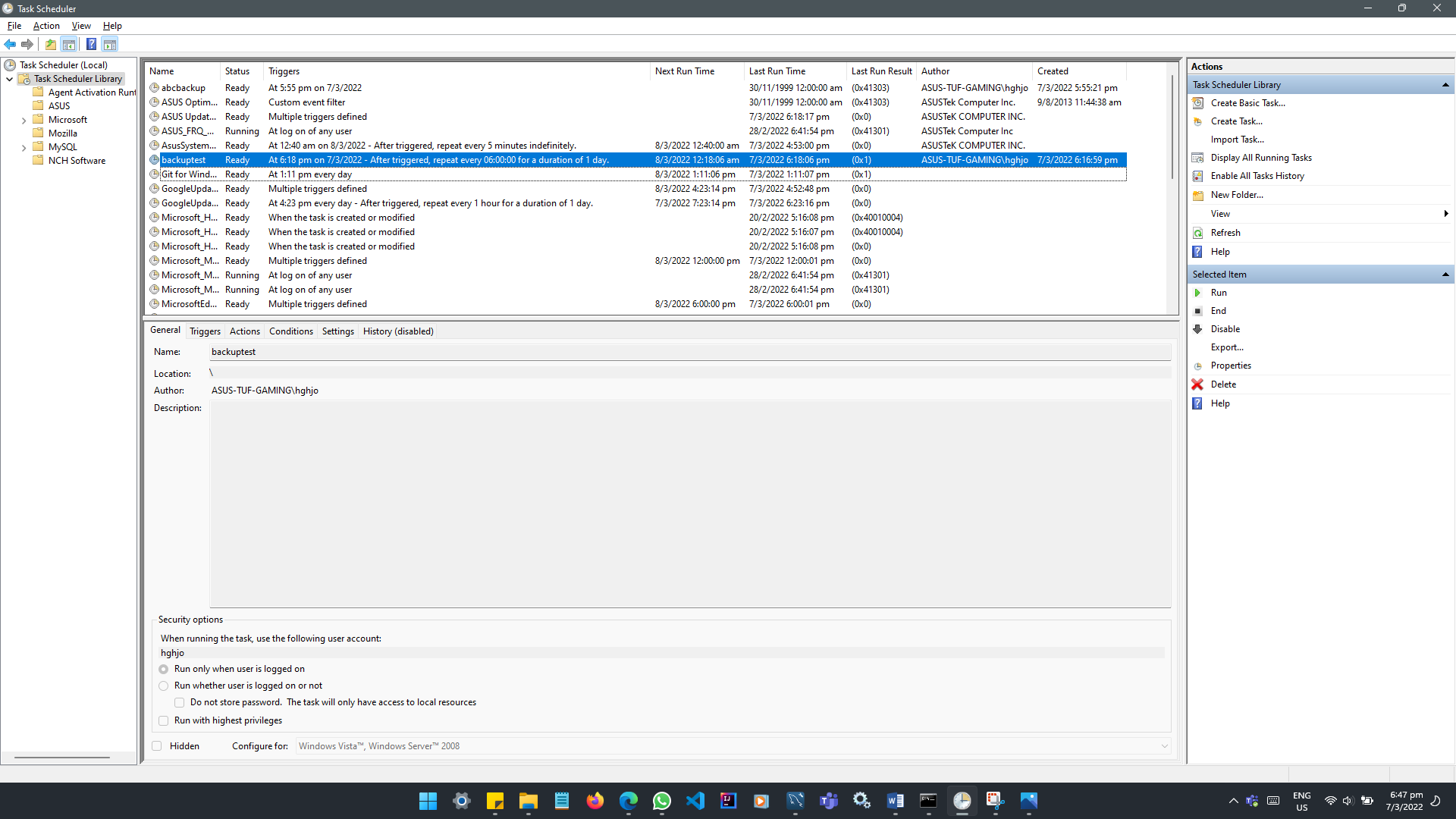
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B. Backup Script & automate every 6 hours:

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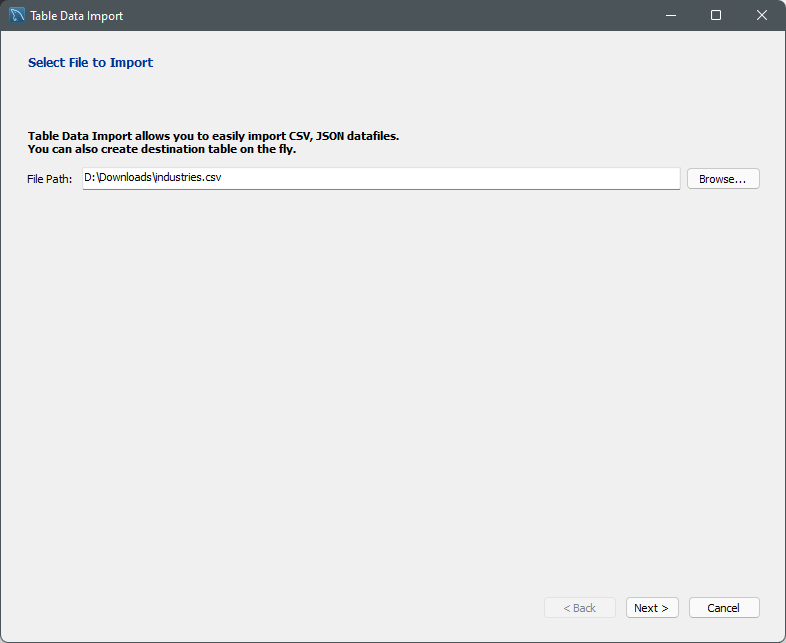


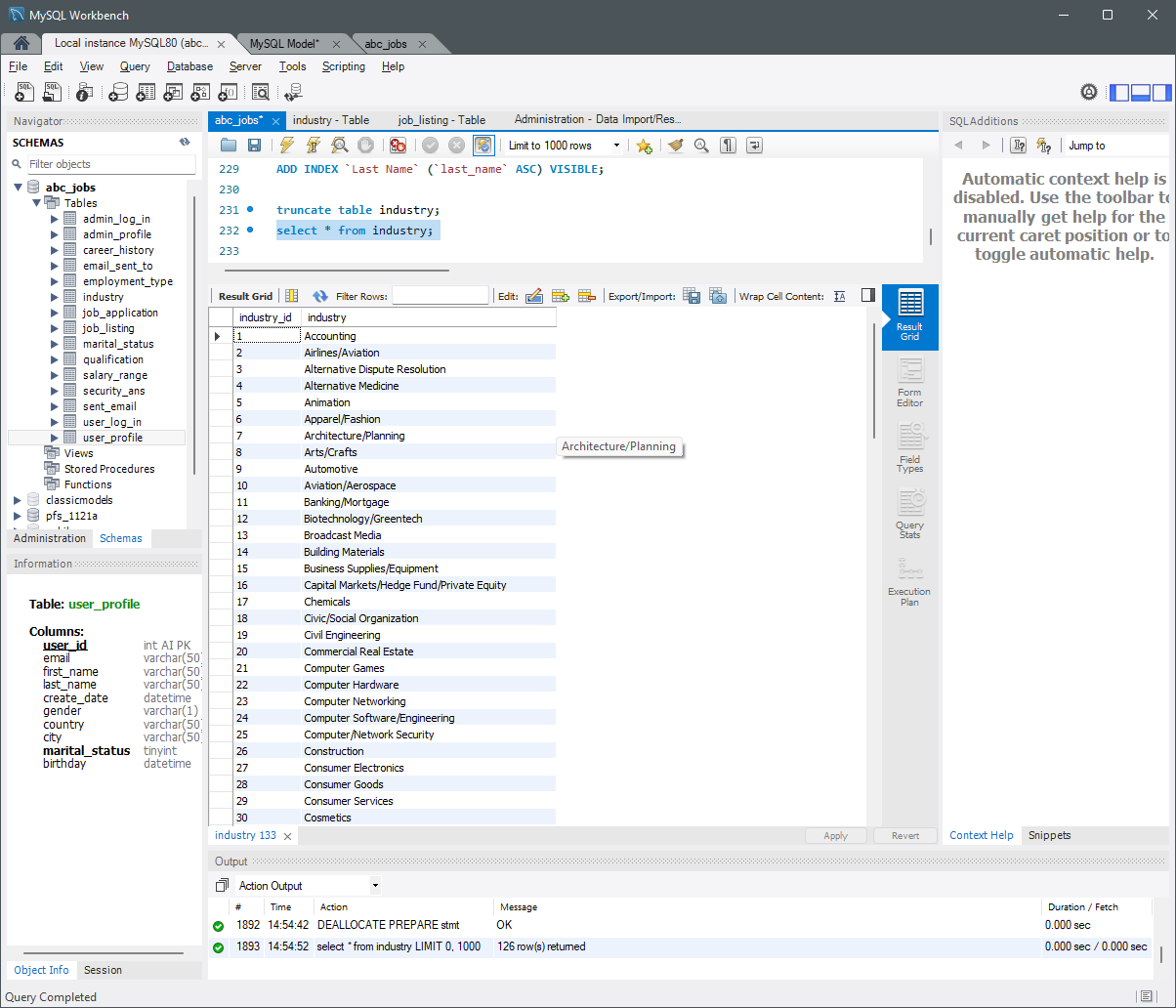




1. **Task 6 –CSV import & SQL Queries**

**CSV import for industry.csv**

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| Page | Table | Function | Query |
| Login | user\_log\_in | Validate login credential | **SELECT** user\_name, user\_password **FROM** user\_log\_in **WHERE** user\_name=”user\_input” **AND** user\_password=”password\_input” |
| Admin log in | admin\_log\_in | Validate login credential | **SELECT** admin\_username, admin\_password **FROM** admin\_log\_in **WHERE** admin\_username=”user\_input” **AND** admin\_password=”password\_input |
| Password reset | user\_log\_in | Change Password | **UPDATE** user\_log\_in  **SET** user\_password = “confirm\_password' **WHERE** user\_name = “user\_input”; |
| Registration | user\_profile | User Registration | **INSERT INTO** user\_profile (email, user\_pass, first\_name, last\_name, birthday, gender, country, state, city, bulk\_email ) **VALUES** (“email\_input’, ‘password\_input’, ‘first\_name, ‘last\_name’, ‘birthday’, ‘gender’, ‘country’, ‘state’, ‘city’, ‘bulk\_email’) |
| Search users | user\_profile | Search for users by first name, last name, country, state or city | **SELECT** first\_name, last\_name, country, state, city **FROM** user\_profile **WHERE** first\_name=”search\_input” **OR** last\_name=”search\_input” **OR** country=”search\_input” **OR**  city=”search\_input” |
| List search results | user\_profile | List users | **SELECT** first\_name, last\_name, country, state, city **FROM** user\_profile **WHERE** first\_name=”search\_input” **OR** last\_name=”search\_input” **OR** country=”search\_input” **OR**  city=”search\_input” |