A cartoon of a coat of arms

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TASK 2

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UFCFU3-15-3 Advanced

Databases

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| MongoDB Setup |

MongoDB setup using MongoDB Compass, and the data was imported straight from the CSV file.

## Connecting localhost

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## Creating a new database and collection

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Note: In a NoSQL model, a single collection (table) can be used to store all data in a denormalised format to simplify data retrieval and reduce complexity.

## Importing data from CSV File

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## The Person Collection

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| Updating Documents |

The data is transformed into a more structured design to improve efficiency:

* The imported CSV file had a flat structure, which made address details, favourite items and neighbours’ information scattered as separate fields. By grouping related data into embedded subdocuments, the data is more readable and organised.
* This design simplifies updates and maintenance, as the entire subdocument can be updated with a single query, reducing redundancy and complexity.
* With this design, queries become more efficient, as MongoDB can fetch entire objects instead of selecting multiple fields when retrieving data. This also improves indexing performance of traversing the nested documents rather than scanning unrelated fields.
* This architecture improves the database's flexibility and scalability for future expansion.

## Updating Addresses

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Instead of having different fields for *Street*, *City*, Country and *Zip Code*, the address details are reconstructed into an array of objects called Address as well as the *type* of address for accommodating new types of addresses such as home, work, etc and different addresses for each person.

## Updating Favourites

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To allow the system to add different types of favourites and many favourites for each kind, all favourite types are reconstructed into an array of objects named *Favourites* rather than having separate entries for *Favourite Book*, *Favourite Drink*, and *Favourite Activity*.

## Updating Neighbours

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All neighbour information is reconstructed into an array of objects named *Neighbours* rather than having separate entries for each neighbour, allowing the system to add several neighbours for each individual without altering the entire collection.

## Example Object After All Updates

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| Document Data Model |

The Document Data Model is created using PlantUML as below:

A diagram of a network

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| Queries |

## Query 1: Display all persons’ name and their ages in years

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## Query 2: Group Persons by their favourite drink and return average age of each group

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## Query 3: Display the average age of people who like Hiking

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A screenshot of a phone

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## Query 4: Display the total number of people from each City and sort it in ascending order by total number of people

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A screenshot of a computer

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## Query 5: Display name of person(s) whose neighbour is neighbour C

A computer screen shot of a computer code

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