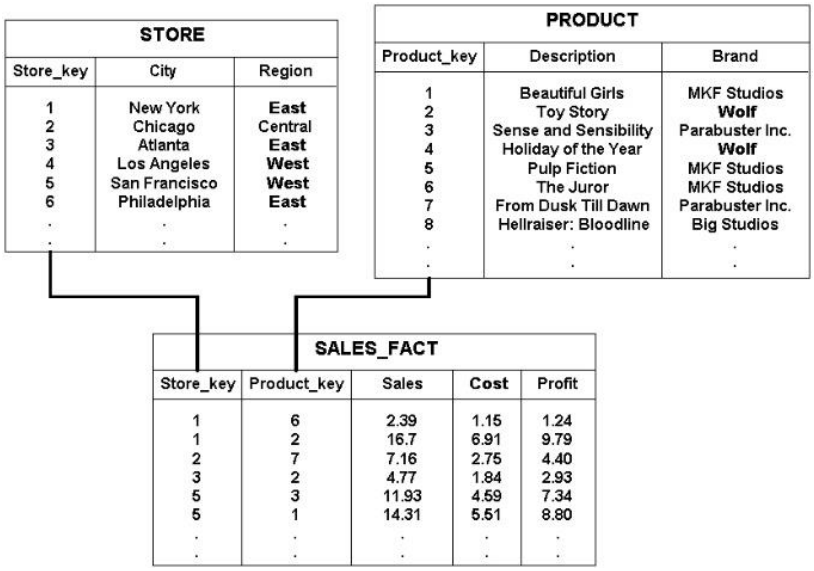
Name: Ghian Carlos R. Tan Year/Course/Section: 3/BSCS/A

TYPES OF DATABASES

When we talk about databases, it is the easiest way to store thousands of data in a computer system. Early years, people usually store data inside a folder and place them individually in their specific containers. This way was the best approach in storing data not until the electronic systems were invented and became famous. Nowadays, using high tech inventions, people can store data in systems with ease. Databases enables us to access, manage and update various information no matter how complex it can be. By understanding the different types of databases we can simply implement what best approach that we should use in handling our data. There are 6 common types of Database; Relational, Analytical, Key-Value, Column-Family, Graph and Document.

Here I will discuss the Different Databases and their specific functions.

- **RELATIONAL DATABASES.** From its name, it represents various data in tables and each tables are related to each other using a key. This key enables one table to access the data from another table based on its data points. Relational databases are pretty much straight forward, it builds a relationship that is based on the previous table and in order to maintain the connection each table must have the attributes in order to establish it. Here is an illustration below that shows the relationship of each tables, as you can see in the image there are two tables that are related to one table and that table has a column or key that are also present to other two.



STORE

Store_key	City	Region
1	New York	East
2	Chicago	Central
3	Atlanta	East
4	Los Angeles	West
5	San Francisco	West
6	Philadelphia	East

PRODUCT

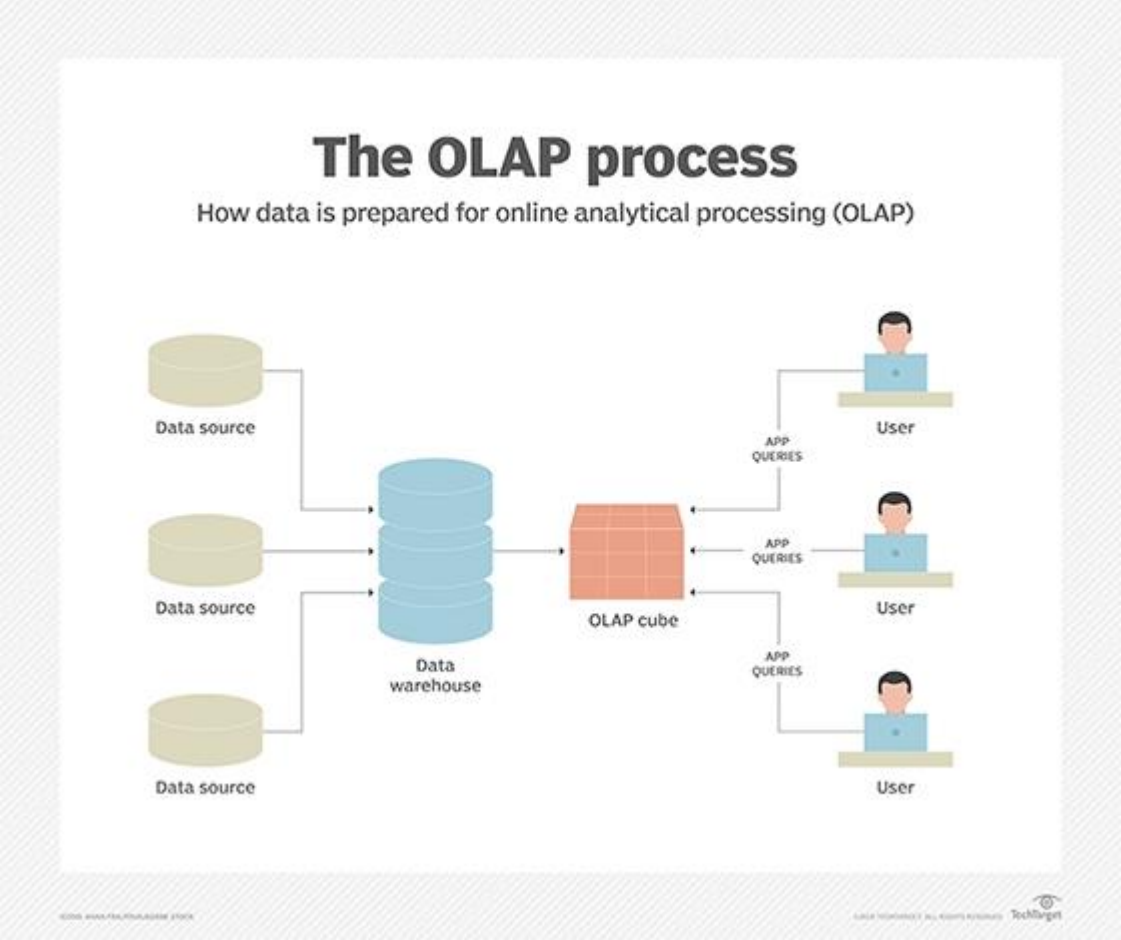
Product_key	Description	Brand
1	Beautiful Girls	MKF Studios
2	Toy Story	Wolf
3	Sense and Sensibility	Parabuster Inc.
4	Holiday of the Year	Wolf
5	Pulp Fiction	MKF Studios
6	The Juror	MKF Studios
7	From Dusk Till Dawn	Parabuster Inc.
8	Hellraiser: Bloodline	Big Studios

SALES_FACT

Store_key	Product_key	Sales	Cost	Profit
1	6	2.39	1.15	1.24
1	2	16.7	6.91	9.79
2	7	7.16	2.75	4.40
3	2	4.77	1.84	2.93
5	3	11.93	4.59	7.34
5	1	14.31	5.51	8.80

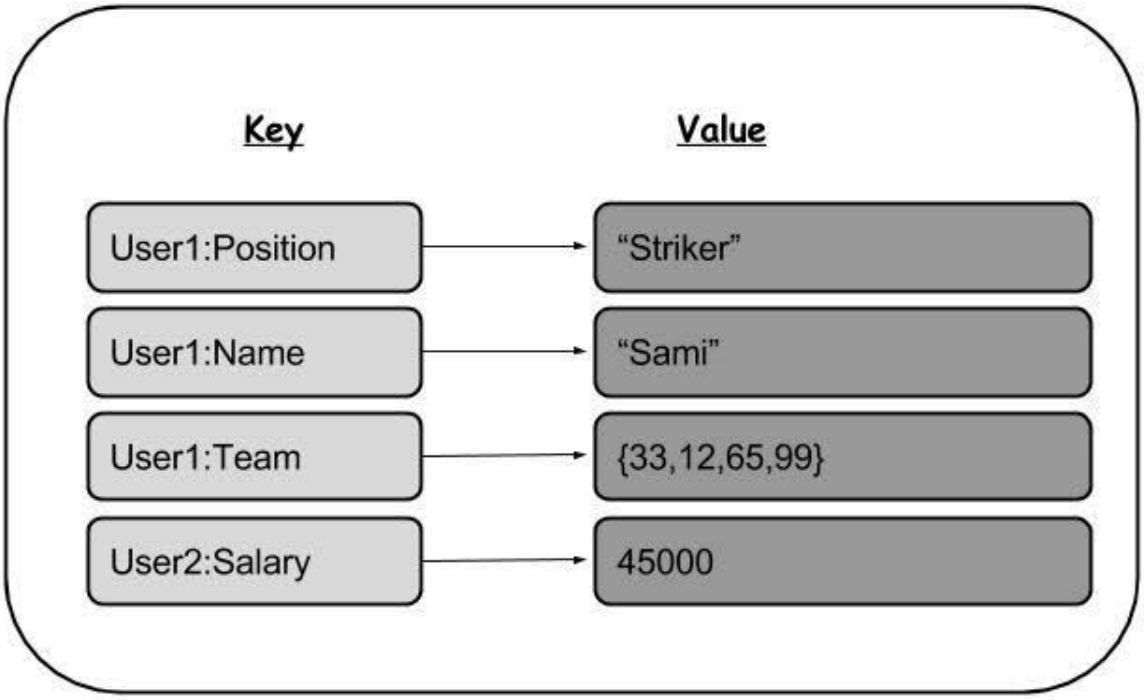
Oracle - https://docs.oracle.com/cd/B14099_19/bi.1012/b13915/i_rel_chapter.htm

ANALYTICAL DATABASE. This database is commonly used by large business companies that needs to execute various information in a small period of time. Today, databases that returns quick responses are highly recommended. Analytical databases, stores data from previous sources and through that information they establish their approach to take. For instance, businesses process collected data and make analytics based on that. In my opinion, I think Facebook is one among of those companies that uses analytical database since they need to timely update every information as well as implement fast queries in handling 24/7 transactions.



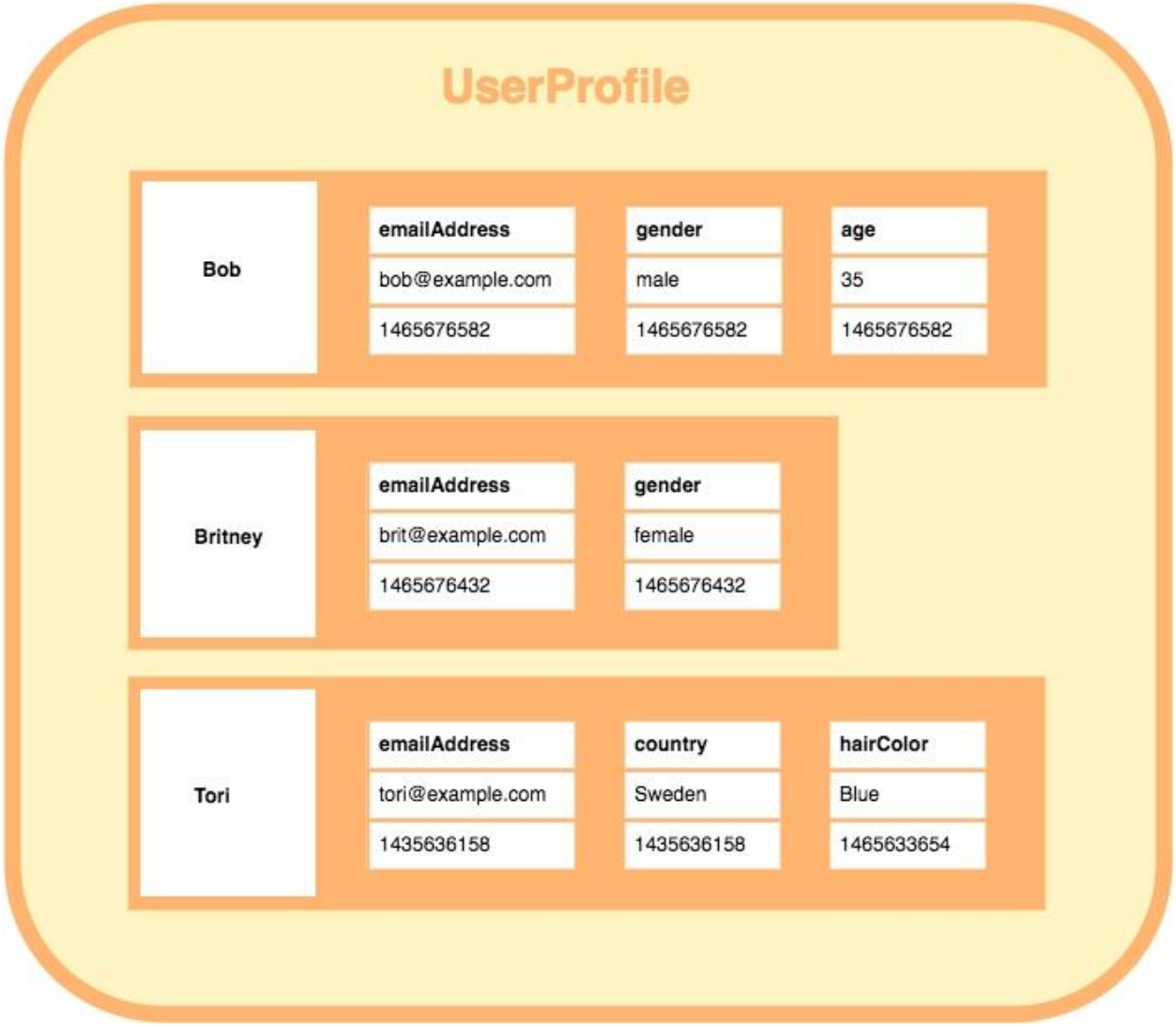
What is an Analytical Database - https://www.google.com/amp/s/searchbusinessanalytics.techtarget.com/definition/analytic-database%3famp=1

- **KEY-VALUE DATABASE.** This database is one of the NoSQL databases, these are different from relational database since it is doesn't support the tabular model in storing data rather they store them in documents. According to *Alex Williams,* Key-Value stores are the most popular NoSQL database. This database is simply follows the same concept on how Arrays or Dictionaries works in programming languages. From its name it follows the key-value approach in which using the key in order to access the value but the only difference is that this approach is implemented in databases. The use of this database is flexible and it is easy to use but the only drawback in using this is that the developer has no complete control over the data. Although, a developer that uses this type of database knew its disadvantage so I guess they already have an idea on how to supplement its disadvantages.



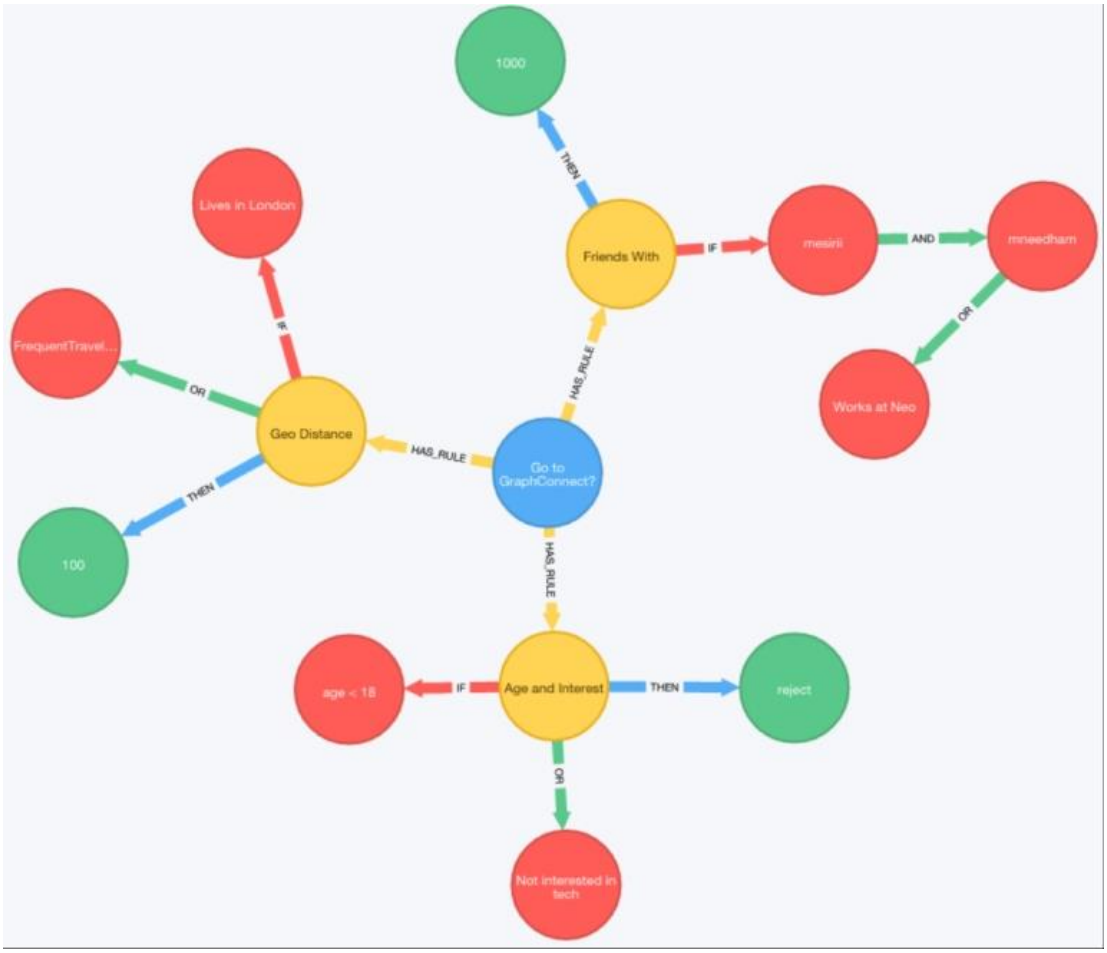
KEY-VALUE NoSQL Database - https://www.researchgate.net/figure/Key-value-NoSQL-Database_fig1_332188615

- **COLUMN-FAMILY DATABASE.** Column-Family databased follows a simple concept, I really like it's models approach, it's pretty similar from the relational database. The only difference is that the rows are made up of profiles and each profiles can have columns that doesn't match from the other rows. I find this database very efficient since it only group columns that are related to each other in relevance to its row key. To put it simply, it groups information in a column model approach. Below shows how this database stores information as a group;



What is a Column Store Database - https://thecustomizewindows.com/2019/10/what-is-graph-database/

- **GRAPH DATABASE.** This database is composed of Nodes, this is similar to the data structure's binary tree. Each nodes is an entity and it has edges that is used to connect to the other. This results to a connection between one or more nodes. I can imagine on how this concept process data, its pretty much like a chain reaction. This type of database doesn't have a limit on how many relationship a node can have. In my opinion, it is called a graph, since it has a structure that shows a graphical representation on how the edges of each nodes are connected to form into a network like illustration.



What is a Graph Database - https://thecustomizewindows.com/2019/10/what-is-graph-database/

- **DOCUMENT DATABASE.** This database is pretty much the same on how most games stores levels and player's data. In games, the developers saves and loads data in each scenes through a JSON like format. This type of database is composed of a key and value pair. Below is an example of Document Database and it pretty much follows the same format in JSON.

```
{
  "_id": "5cf0029caff5056591b0ce7d",
  "firstname": "Jane",
  "lastname": "Wu",
  "address": {
    "street": "1 Circle Rd",
    "city": "Los Angeles",
    "state": "CA",
    "zip": "90404"
  }
  "hobbies": ["surfing", "coding"]
}
```

What is a Document Database - https://www.mongodb.com/document-databases

REFERENCES

- What is a Relational Database? - https://www.oracle.com/ph/database/what-is-a-relational-database/
- What is an Analytical Database? - https://www.omnisci.com/technical-glossary/analytical-database
- NoSQL Database - https://www.couchbase.com/resources/why-nosql
- Alex Williams, Key-Value Databases - https://www.kdnuggets.com/2021/04/nosql-explained-understanding-key-value-databases.html
- What is Graph Database? - https://whatis.techtarget.com/definition/graph-database
- What is a Document Database - https://aws.amazon.com/nosql/document/
- Document Database - https://www.mongodb.com/document-databases