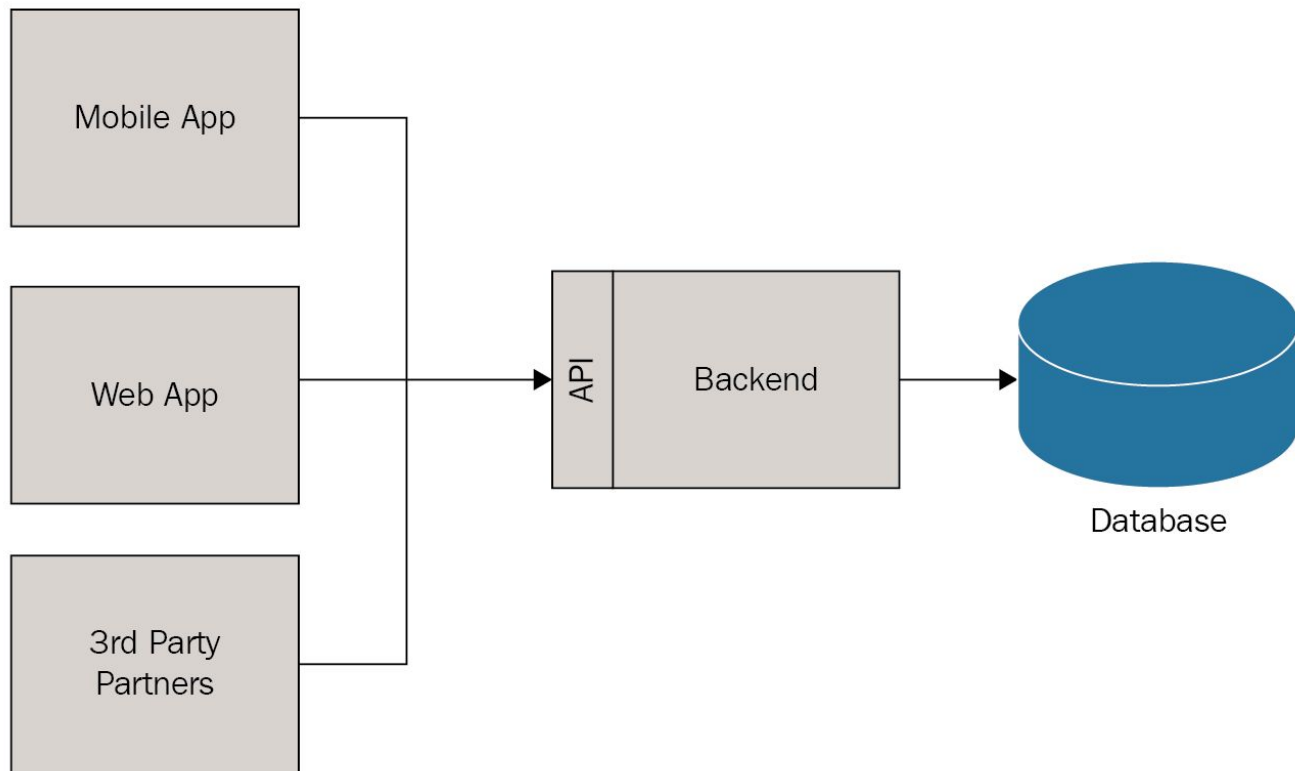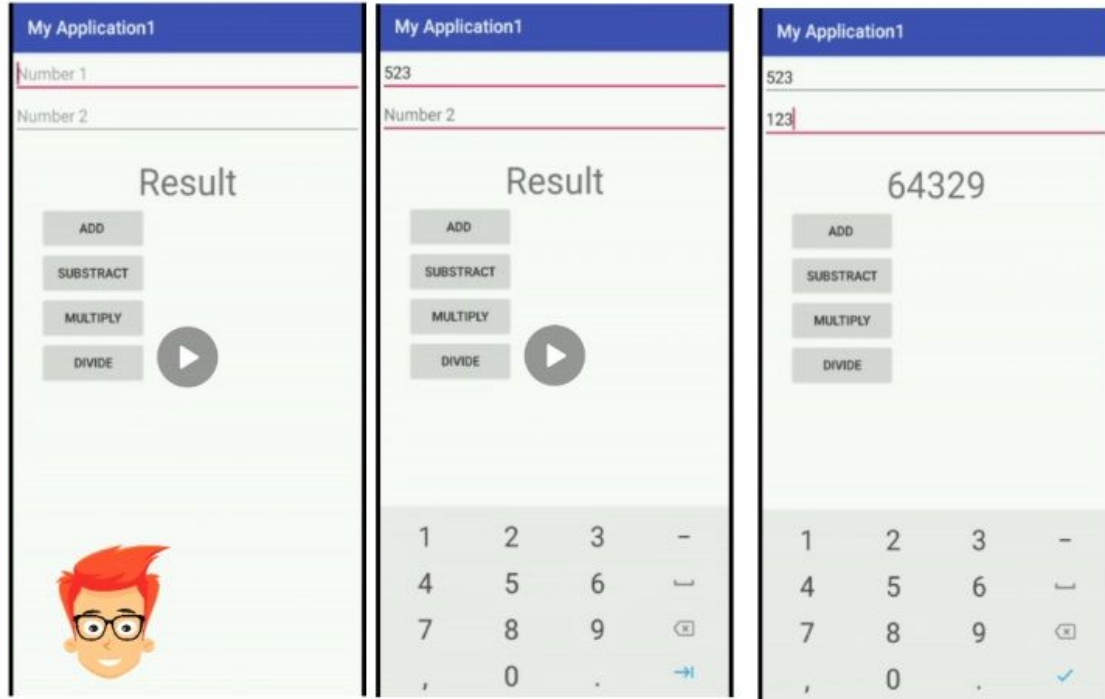# Database Operations using C++

OOPS Session - Thursday (9-10 am)

Any Software Product!

Calculator that you guys did :)

Database?

- A database is **an organized collection of structured information, or data, typically stored electronically in a computer system.**
- The data can then be easily accessed, managed, modified, updated, controlled, and organized.
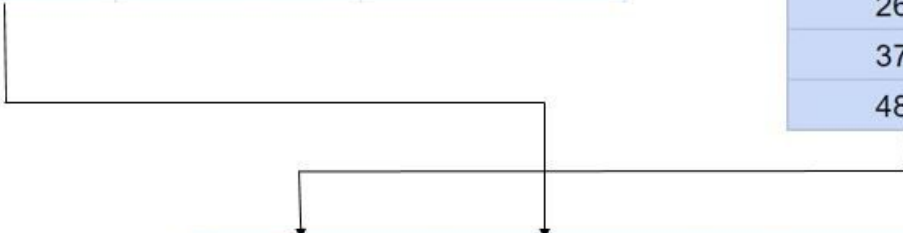
Relational vs Non Relational

- A relational database is one that stores data in tables. The relationship between each data point is clear and searching through those relationships is relatively easy.
- A **non-relational database** is any database that does not use the tabular schema of rows and columns like in relational databases. Rather, its storage model is optimized for the type of data it's storing.

Relational

Name	Dry/Wet Food	Good Boy (Y/N)
Fido	Dry	Y
Rex	Wet	N
Bubbles	Dry	Y
Cujo	Wet	N

Tag #	Height (in)	Weight (lbs)
1573	15	21
2684	9	7
3795	27	130
4806	6	5

Tag #	Name	Breed	Color	Age
1573	Fido	Beagle	Brown/White	1.5
2684	Rex	Pekingese	White	9
3795	Bubbles	Rottweiler	Black	5
4806	Cujo	Chihuahua	Gold	4

Non Relational

Key	Document

1001	{
	  "TagID" : 1573 ,
	 "Dimensions": [
	  { "Height" : 15,
	   "Weight" : 21
	  }],
	  "Name:" Fido
	}

1002	{
	  "TagID" : 2684 ,
	 "Dimensions": [
	  { "Height" : 9,
	   "Weight" : 7
	  }],
	  "Name:" Rex
	}

What's SQL btw?

- SQL is a standard language for storing, manipulating and retrieving data in relational databases.

```
CREATE TABLE Persons (
    PersonID int,
    LastName varchar(255),
    FirstName varchar(255),
    Address varchar(255),
    City varchar(255)
);
```

```
INSERT INTO PERSONS
VALUES (1,'Sharan','SK','Sharan Addr','Salem');

SELECT * from PERSONS;
```

Recent Favorites

- information_schema
- sql6449193
  - New
  - People

✓ Showing rows 0 - 2 (3 total, Query took 0.1774 seconds.)

```sql
SELECT * FROM `People`
```

☐ Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table   Sort by key: None ▾

+ Options

←T→			PersonID	Name	Address	City
☐	✎ Edit	⊞ Copy ⊖ Delete	1	Sharan	Sharan Address,Salem	Salem
☐	✎ Edit	⊞ Copy ⊖ Delete	2	John	John Address,Anantapur	Anantapur
☐	✎ Edit	⊞ Copy ⊖ Delete	3	Subin	Subin Address,Kanyakumari	Kanyakumari

↑ ☐ Check all   With selected: ✎ Edit ⊞ Copy ⊖ Delete ⊟ Export

☐ Show all | Number of rows: 25 ▾   Filter rows: Search this table   Sort by key: None ▾

Query results operations

🖶 Print ⊞ Copy to clipboard ⊟ Export 📊 Display chart 📋 Create view

Console

Database using C++?

- C++ (+) MySQL(A relational database).
- #include <mysql/mysql.h>
- MYSQL *conn;
- conn = mysql_init(0);
- conn = mysql_real_connect(conn, "Server", "Username", "Pass", "DatabaseName", 0, NULL, 0);

```cpp
#include<iostream>
using namespace std;
#include <mysql/mysql.h>
int main(){
    MYSQL *conn;
    conn = mysql_init(0);
    conn = mysql_real_connect(conn, "sql6.freemysqlhosting.net", "sql6449193", "hHQdh26Iai", "sql6449193", 0, N
    if (conn){
        cout<<"Connected"<<endl;
    }
    else{
        cout<<"Not Connected";
    }
    return 0;
}
```

Create a MySQL table using C++!

```cpp
conn = mysql_real_connect(conn, "sql6.freemysqlhosting.net", "sql6449193", "hHQdh26Iai", "sq
if (conn){
  cout<<"Connected"<<endl;
    qstate = mysql_query(conn,"CREATE TABLE Student(StudentID int,Name text,Marks int)");
    if (!qstate){
        cout<<"Table Created"<<endl;
    }
    else{
        cout<<"Create Error"<<mysql_error(conn) << endl;
    }
}
else{
  cout<<"Not Connected";
}
```

View some Table?

```cpp
conn = mysql_real_connect(conn, "sql6.freemysqlhosting.net", "sql6449193", "hHQdh26Iai", "sql6
if (conn){
    cout<<"Connected"<<endl;
    qstate = mysql_query(conn, "SELECT * FROM People");
    if (!qstate){
        res = mysql_store_result(conn);
        while(row = mysql_fetch_row (res)){
            cout<<"ID : "<< row [0]<<endl;
            cout <<"Name: "<<row [1]<<endl;
            cout <<"Address: "<< row [2]<<endl;
            cout <<"City: " <<row [3] <<endl;
        }
    }
    else{
        cout<<"View Error"<<mysql_error(conn) << endl;
    }
}
else{
    cout<<"Not Connected";
}
return 0;
```

Insert something finally :)

```cpp
conn = mysql_real_connect(conn, "sql6.freemysqlhosting.net", "sql6449193", "hHQdh26Iai", "sql6449193", 0
if (conn){
    cout<<"Connected"<<endl;
    string s = "";
    const char* q = s.c_str();
    qstate = mysql_query(conn,"INSERT INTO People VALUES(3,'Subin','Subin Address,Kanyakumari','Kanyakum
    if (!qstate){
        cout<<"Inserted"<<endl;
    }
    else{
        cout<<"Insert Error"<<mysql_error(conn) << endl;
    }
}
else{
    cout<<"Not Connected";
}
return 0;
```

Links to the Code and Many more! -_-

- Codes - https://github.com/YogaVicky/OOPS/tree/main/Database
- Relational vs Non Relational DB's - https://www.logianalytics.com/relational-vs-non-relational-databases/
- SQL - https://www.w3schools.com/sql/default.asp

THANKS GUYS!