“ Document for database manager system “

First we use the factory design pattern and the singleton design pattern. we will show you it later .

now let's start with main :

here we make access form main to 3 files: Connection.js file , QueryController.js file and FileController.js file To get to the functions in them .

```
const Connection = require('./Connection.js')
const QueryController = require('./QueryController.js')
const FileController = require('./FileController.js')
```

then import the Connection class from file Connection.js :

```
let connection_ = new Connection.Connection()
```

After that, we give the system the Shared information to make connections at any Postgres database .

ConnectionDetails_ is an object. we declare it in the connection.js file and we import it here to set its values .

```
let connectionDetails_ =  Connection.connectionDetails;
connectionDetails_.hostName = prompt("enter the name of host : ");
connectionDetails_.user = prompt("enter the name of user : ");
connectionDetails_.passWord = prompt("enter the password : ");
connectionDetails_.port = prompt("enter the port : ");
```

here we call GetNewConnection function from Connection class to connect with database in postgre sql .
the parameter we need it to make a new connection is connection details and name of database .

the connection on local database is done successfully here

```
const localDB=connection_.GetNewConnection(connectionDetails_,"localDB");
localDB.connect()
```

we need to make a connection on the local database for connection profile and to authorize the user at sign in process .

here we have the main function which we will calling it to finally :

```
async function Main(connectionDetails_){
  const log4js = require('log4js');

  // Create the logger
  const logger = log4js.getLogger();
  try{
      console.log("Sign in :")
      usrId =prompt("enter your id  : ");
      passWord =prompt("enter your password  : ");
      const result =await autherizUser(usrId,passWord);


      if (result.length == 1){
        logger.level = 'info';
        logger.info('Successfully!');
        console.log("welcome in your manegar database : ")
        database = prompt("enter the name of DB : ");

        // Instantiate User
        connection_.ConnectionProfile(connectionDetails_,database,localDB)

        const client=connection_.GetNewConnection(connectionDetails_,database);
        client.connect();


        await Implementation(client)
      }
      else if(result.length ==0){
        logger.level = 'error';
        logger.error('The id is not available...');
        console.log("sign_up plz")
        return 0;
      }

  }
```

We import log4js for loggers .
First the user will enter his/her id and password to make authorization to the user .

after the user enter her/his id and password and send it to

```
const result =await autherizUser(usrId,passWord);
```

this function will make quere at localDB at users table particularly at user_id column if this table has user id and password that's matching with id and password which entered by user then its return result .

```
function autherizUser(userId,password){
  return new Promise( ( resolve, reject ) => {
    localDB.query("SELECT user_id FROM users WHERE user_id = '"+ userId +"' and password = '" +password+"'", (err
        if (err){
          return ( err );
        }
        resolve(result.rows);

    });
  })
}
```

if the length of result from AuthorizedUser function ==1 that means that we have a user with an id and password like the entered id and password .

```
  if (result.length == 1){
          logger.level = 'info';
          logger.info('Successfully!');
          console.log("welcome in your manegar database : ")
          database = prompt("enter the name of DB : ");

          // Instantiate User
          connection_.ConnectionProfile(connectionDetails_,databa
se,localDB)

          const
client=connection_.GetNewConnection(connectionDetails_,database);
          client.connect();


           await Implementation(client)
        }
        else if(result.length ==0){
          logger.level = 'error';
          logger.error('The id is not available...');
          console.log("sign_up plz")
          return 0;
        }
```

if the authorization is done successfully .
Now the user will be able to use the services provided by the application .

enter the name of the database which the user wants to make a connection on.
after enter the database name we will call the ConnectionProfile
function to store the base on connections table if it is not founded or to make the connection directly .

```
database = prompt("enter the name of DB : ");

          connection_.ConnectionProfile(connectionDetails_,databa
se,localDB)
```

```
const
client=connection_.GetNewConnection(connectionDetails_,database);
client.connect();
```

the const client is connected to the database the user choice it .

finally we will call the `Implementation(client)` function and send to client to making query on it .

in the `Implementation` function we print a list of services we providing it for user .

```
        console.log("\n      List of Jobs :) ")
        console.log(" 1. make a query :) ")
        console.log(" 2. import file to database :) ")
        console.log(" 3. export data from database :) ")
        console.log(".....
")
        let choice = prompt("enter the number of job you want
from list : ");
```

And ask the user to enter any service he wants?

if the user choose 1 (make a query):
another list will display on console ::
And ask the user to enter any service he wants again ?

```
            case '1' :
              {
                console.log(" List of query :) ")
                console.log(" 1. write your query :) ")
                console.log(" 2. Get Table Data by add table name :) ")
                console.log(" 3. Get tables in database :)**********")
                console.log(" 4. Get culumns for spesfic table :)**********")
                console.log(" 5. Drop Table by table name :) ")
                let choice_ = prompt("enter the number of job you want from list  : ");
```

Here we ask the user to enter the type of query he want to to send it to the GetInstance function to have instance from this query type and store it on the queryInstance variable ..

```
                let queryController= new QueryController();
                let queryType = prompt("enter the type of query you want ('Insert','Read','Write','Delete')  : ");
                let queryinstance =  queryController.GetInstance(queryType);
```

if the user choose 1 :
he/ she will write any query he/she want

but to make the experience easier without the front end I print all tables on the database by calling the GetDBTables function and send the client which connects to our database .

then call GetQuery(client) function .

```
const result = await  queryinstance.GetDBTabels(client);
console.log(result)
queryinstance.GetQuery(client);
```

GetQuery(client) function :
it asks the user to enter its sql query then send it to Api to get the result .

```
GetQuery(client){

  let query=enter("enter your query plz : ")
  client.query(query, (error, result) => {
    if (error) {
      ogger.level = 'error';
      logger.error('syntext query error');
      console.log(error.stack)
    } else {
      logger.level = 'info';
      logger.info('show the rows');
       console.log(result.rows)
    }
  })
}
```

if the user choose 2 :
first all tables in database will display for users to select the table he want to display it data .

```
const result = await queryinstance.GetDBTabels(client);
console.log(result)
queryinstance.GetTableData(client);
}
```

This is an addition by me “dina” .

first i ask the user enter the table name and then send it to api to display row of data in this table ..

```
//Dina
GetTableData(client)
{


   var tableName = enter("enter table name : ")
   client.query("Select * from "+tableName, (error, result) => {
      if (error) {
         logger.level = 'error';
         logger.error('the data is not found');
         console.log(error.stack)
      } else {
         console.log(result.rows)

      }
   })
}
```

if the user choose 3 :

the system will call GetTabels(client)

```
try{
   const result = await queryinstance.GetDBTabels(client);
   console.log(result)
}
```

GetTabels(client)

```
GetDBTabels(client){
   return new Promise( ( resolve, reject ) => {
      client.query("select table_name from information_schema.tables where table_schema='public'", (err, result)
         if (err){
          logger.level = 'error';
          logger.error('the table is not found');
            return reject( err );
         }
         {

            resolve( result.rows);

         }

      });
   })
```

if the user choose 4 :

a list of all tables will display for user then by call GetTables function and then we ask user to enter table name to send it for GetColumns function to return the result for user and display it on console .

```
const result = await queryinstance.GetDBTabels(client);
console.log(result)
const tableNname = prompt("enter name of table you want to display its columns  : ");
const columnsResult = await queryinstance.GetDBColumns(tableNname,client);
console.log(columnsResult)
```

if the user enter 5 :

the user will enter the table name he/she want to drop it and send it to the DeleteTable function .

```
const result = await queryinstance.GetDBTabels(client);
console.log(result)
const tableNname = prompt("enter name of table you want to display its columns  : ");
await queryinstance.DeleteTable(tableNname,client);
```

this is the DeleteTable function .

```
DeleteTable(tableName,client) {

    client.query("drop table "+tableName, (error, result) => {
        if (error) {
            console.log(error.stack)
        } else {
            console.log("table is deleted : ")

        }
    })
}
```

if the user chooses 2 (import file to database)from the first list ..

the system ask the user to enter the file type to send it to ImportFile at FileController Class which I have create instance from it .

```
case '2':
    {


    let fileType = prompt("enter the type of file you want import to Database  : ");

    const fileController_ = new FileController();

    fileController_.ImportFile(fileType,client);

      break;
    }
```

if the user enter Csv in ImportFile at FileController Class :

we will call GetInstance and send file Csv string as parameter to send it to createInstance at FileFactory .

then i read the file by call ReadFile function witch ask the bath of the file to read it .

After reading it and store the result at data variable i take the header at index 0 and send it to SchemaIsFounded function .. to check the schema of all tables in the database with the schema for csv file and the return table name if it is found or return null if it is not found ..

if the table name is not equal null i will send the data without header to the ImportData function , Which will roll over all rows in a data , and send it to the `InertFilesData(values,table,client)` function at Query.js file to implement post Api thats will insert the data to table.

else if the table is not founded i will call creatTable function in Query.js fill witch ask the user to enter table name and take csv file schema and create new table then call ImportData function to fetch the data to table .

```
        if(fileType==fileType__.CSV){

            const csvFile=this.GetInstance(fileType)
            let data =csvFile.ReadFile("C:\\Users\\hp\\Desktop\\all\\data.csv")
            csvFile.SchemaIsfounded(client,data[0],fileType).then(tableName => {
                console.log(tableName)
                if(tableName!=null){
                    data.shift()
                    data.pop()
                    csvFile.ImportData(data,tableName,client);
                }else{
                    let schema = csvFile.CreateSchema(data[0]);
                    console.log(schema)
                    tableName =insert.CreateTable(schema,client);
                    data.shift()
                    data.pop()
                    csvFile.ImportData(data,tableName,client);
                }
```

SchemaIsFounded function :

```
async SchemaIsfounded(client,data,fileType){
    let result;
    let get=new query.Read();
    const dataBaseTables =await get.GetDBTabels(client);

    for(var i=0;i<dataBaseTables.length;i++){

        const columnObject= await get.GetDBColumns(dataBaseTables[i].table_name,client);
        var columnArray = [];
        for(var j=0;j<columnObject.length;j++){
            columnArray.push(columnObject[j].column_name)
        }

        if(JSON.stringify(columnArray) === JSON.stringify(data))  {
            result=dataBaseTables[i];

            logger.level = 'info';
            logger.info('schema has found');
                return(result.table_name) ;



          }

    }
}
```

ImportData function :

```
ImportData(data,tableName,client){

    for (var i = 0; i < data.length; i++) {
        var values=this.GetValues(data,i)
        var table = tableName ;
        const insert = new query.Insert();
        insert.InertFilesData(values,table,client)
    }


}
```

the same thing for the Json file ...

```
}else if(fileType = fileType__.JSON){

    const jsonFile=this.GetInstance("Json")
    let data =jsonFile.ReadFile("User.json")

    let jsonHeader=[]
    for (let key in data[0]) {
        jsonHeader.push(key);
    }

    let row_=[]
    let rows_=[]
    for(var i=0;i<data.length;i++){
    for(var j=0;j<jsonHeader.length;j++){
        row_.push(data[i][jsonHeader[j]]);
    }

    rows_.push(row_)
    row_=[];
    }

    jsonFile.SchemaIsfounded(client,jsonHeader,fileType).then(tableName_ => {
       console.log(tableName_)
        if(tableName_!=null){

            jsonFile.ImportData(rows_,tableName_,client);

        }else{

            let schema = jsonFile.CreateSchema(jsonHeader);
            let tableName_ =insert.CreateTable(schema,client);
            jsonFile.ImportData(rows_,tableName_,client);


        }
```

then if the user choose 3 (Export date from table to file) :

We will write the data from a specific table in the data table with its header to the csv file .

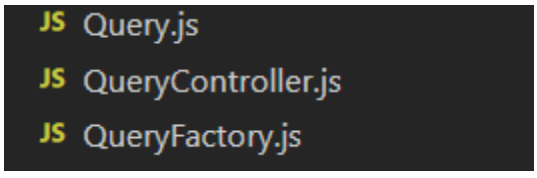
```
pool.connect((err, client, done) => {
 logger.level = 'Error';
 logger.Error('connection failed');
  if (err) throw err;

  client.query("SELECT * FROM customers", (err, result) => {
    done();
    if (err) {
     logger.level = 'error';
     logger.error('query syntext error');
      console.log(err.stack);
    } else {
      const jsonData = JSON.parse(JSON.stringify(result.rows));
      console.log("jsonData", jsonData);

      const csvWriter = createCsvWriter({
        path: "csvWriter.csv",
        header: [
          { id: "id", title: "id"}  ,
          { id: "name", title: "name" },
          { id: "city", title: "city" }

        ]
      });
      csvWriter
        .writeRecords(jsonData)
        .then( () =>
        logger.level = 'info',
        logger.info('Successfully!'),
          console.log("csvWriter.csv successfully!")
        );
    }
  });
});
```

here we applied a factory design pattern at Query to create an instance for query according to the query type that the user entered …



```
class QueryFactory {


    CreateQuery(queryType){
        const log4js = require('log4js');
        // Create the logger
        const logger = log4js.getLogger();
        let queryType_= Constants.QueryType;
        if(queryType==queryType_.READ){
            const read = new Query.Read();
            logger.level = 'info';
            logger.info('query viewed');
            return read ;
        }
        if(queryType==queryType_.WRITE){
            const write = new Query.Write();
            logger.level = 'info';
            logger.info('query written');
            return write ;
        }
        if(queryType==queryType_.INSERT){
            const insert = new Query.Insert();
            logger.level = 'info';
            logger.info('query iserted');
            return insert ;
        }
        if(queryType==queryType_.DELETE){
            const delete_ = new Query.Delete();
            logger.level = 'info';
            logger.info('query deleted');
            return delete_ ;
        }
        return null;
    }
```

the same thing for file ..

```
class FileFactory {


        CreateFile(fileType){
            let fileType_= Constants.FileType;
            if(fileType==fileType_.CSV){
                const csv = new File.Csv();
                return csv ;
            }
            if(fileType==fileType_.JSON){
                const json_ = new File.Json();
                return json_ ;
            }
            if(fileType==fileType_.XML){
                const xml = new File.Xml();
                return xml ;
            }
            return null;

        }


}
module.exports = FileFactory

```

and applied singleton design pattern at connection class .

```
class Connection {
    database=""
    constructor() {
        if (Connection.instance) {
            logger.level = 'info';
            logger.info('Created !');
          console.log("Instence is already created : ")
          return Connection.instance
        }
        Connection.instance = this;
        logger.level = 'info';
        logger.info('Successfully!');
        console.log("Create instence is done succssfuly : ")
     }
```

finally we using the logger in our code and print its details at file.log :

```
[2021-12-16T02:11:18.806] [INFO] default - Successfully!
[2021-12-16T02:11:40.408] [INFO] default - return the host
[2021-12-16T02:11:40.408] [INFO] default - return the user
[2021-12-16T02:11:40.409] [INFO] default - return the port
[2021-12-16T02:11:40.409] [INFO] default - return the password
[2021-12-16T02:11:40.409] [INFO] default - return the database
[2021-12-16T02:11:40.409] [INFO] default - return the new database
[2021-12-16T23:25:59.437] [INFO] default - Successfully!
[2021-12-16T23:26:18.306] [INFO] default - return the host
[2021-12-16T23:26:18.307] [INFO] default - return the user
[2021-12-16T23:26:18.307] [INFO] default - return the port
[2021-12-16T23:26:18.307] [INFO] default - return the password
[2021-12-16T23:26:18.309] [INFO] default - return the database
[2021-12-16T23:26:18.309] [INFO] default - return the new database
[2021-12-16T23:26:24.326] [INFO] default - Successfully!
[2021-12-16T23:26:28.125] [INFO] default - return the host
[2021-12-16T23:26:28.126] [INFO] default - return the user
[2021-12-16T23:26:28.126] [INFO] default - return the port
[2021-12-16T23:26:28.126] [INFO] default - return the password
[2021-12-16T23:26:28.126] [INFO] default - return the database
[2021-12-16T23:26:28.127] [INFO] default - return the new database
[2021-12-16T23:30:03.231] [DEBUG] default - query  controller enter!
[2021-12-16T23:30:03.231] [INFO] default - query viewed
[2021-12-16T23:30:03.231] [INFO] default - query return
[2021-12-16T23:30:16.885] [INFO] default - show the rows

```

and we using exceptions in our code ::
you will see more examples at the code ..

```
catch(e){
  logger.level = 'error';
  logger.error('The id is not available...');
  console.log("Authentication failed, try again..")

  Implementation(client);
}
```

THE END :)