COMSATS University Islamabad (CUI)

Project Report

for

Video Games Archive Rating System

Version 1.0

By

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Co-Supervisor (if any)

Co-Supervisor Name

Bachelor of Science in Software Engineering (2021-2022)

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Project Category: (Select all the major domains of proposed project**)**

A-Desktop Application/Information System **B-**Web Application/Web Application based Information System **C-**Problem Solving and Artificial Intelligence **D-**Simulation and Modeling **E-**Smartphone Application
F-Smartphone Game **G-**Networks **H-**Image Processing

ABSTRACT

The system we will develop is a video game archive rating system. It provides details about video games, their release year, their genres, their designers etc. There is no system like this which I came across to so it would be the first one of its sort in my opinion. This system would be a go to for any person who wants to learn more about video games.

1. Introduction

The project proposes a solution to the problem that you have to search about videogames from here and there. The system will keep the record and makes it easy for end users to view all information about a video game. The detailed information includes release years, genres, designers, platforms, and engines of the video games. The system allows easy information gathering rather than wasting hours.

2. Problem Statement

Many persons waste a lot of time searching about a video game. And even after spending that much time they still are not able to decide whether to buy it or not. And even if they end up buying it they don’t play it wasting their time as well as money.

3. Problem Solution of the Proposed System

The system we developed is a Video game archive rating system. It provides information about video games. The detailed information includes release years, genres, developers, rating, platforms, and engines of the video games. The system allows the user to view info about the game and see its rating according to the critics. The user can then make the decision on whether to buy this game or not saving both his time and money.

3.1 Objectives

1. Provide a system to check videogames ratings
2. Provide a system to check videogames price
3. Allow a user to make a list of his favorite games
4. Provide a system to see videogame details

4. Related System Analysis/Literature Review

We personally don’t know about any system like that.

5. Advantages/Benefits of proposed system

1. To store your favorite games alongside their information
2. All necessary information about videogames inside one system

6. Scope

The system we will develop will provide a use friendly interface to gamers to view all necessary information about video games. The user will be able to create account using email, name and password to access the system.

7. Modules

7.1 Module 1: USER

This module will have the following rights

1. User can make account to access the system,
2. User can see video game
3. User can see video game's information
4. User can create a list comprising of his favorite games.

8. System Limitations/Constraints

There is no system we can find in real world that is without any Limitation or Constraints so ours also has limitations.

1. The world of video games is a vast one so all the information can't be added at once so you might not be able to find all video games at once.
2. Cannot use main system till you Login/Signup.
3. No way to login if you forget your ID.

9. Tools and Technologies

Mention all the hardware/software tools and technologies with version number which will be used in implementation of the project. Write about the APIs, language(s), SDK(s) etc. which you will use for implementation.

Tools And Technologies	**Tools**	**Version**	**Rationale**
	Apache NetBeans	12.6	IDE
	MySQL WorkBench	8.0	DBMS
	XAMPP	8.1.1	DBMS/SERVER
	MongoDB	5.05	DBMS
	Technology	**Version**	**Rationale**
	Java	1.8.0_51	Front-end/Back-end Development

10. Project Stakeholders and Roles

Project Sponsor	COMSATS University Islamabad, Islamabad Campus
Stakeholder	1. Muhammad Anis Sarwar (SP20-BSE-053) 2. Muhammad Bilal Arshad (SP20-BSE-055) 3. Doctor Basit Raze 4. Users

11. Work Division

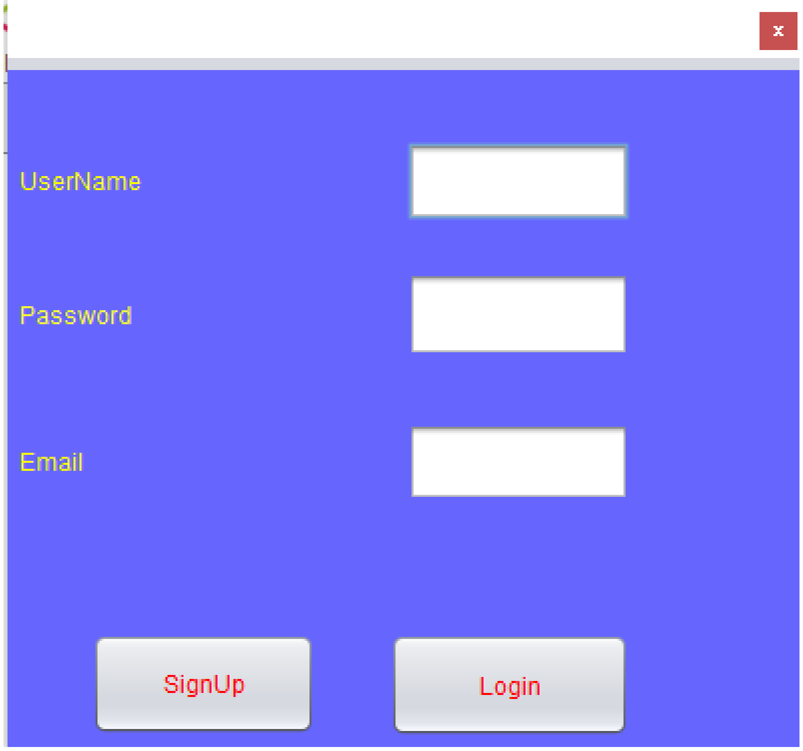
Student Name	**Student Registration Number**	**Responsibility/ Module / Feature**
Muhammad Anis Sarwar	SP20-BSE-053	MongoDB with frontend and backend
Muhammad Bilal Arshad	SP20-BSE-055	SQL with frontend and backend

12. Data Gathering Approach

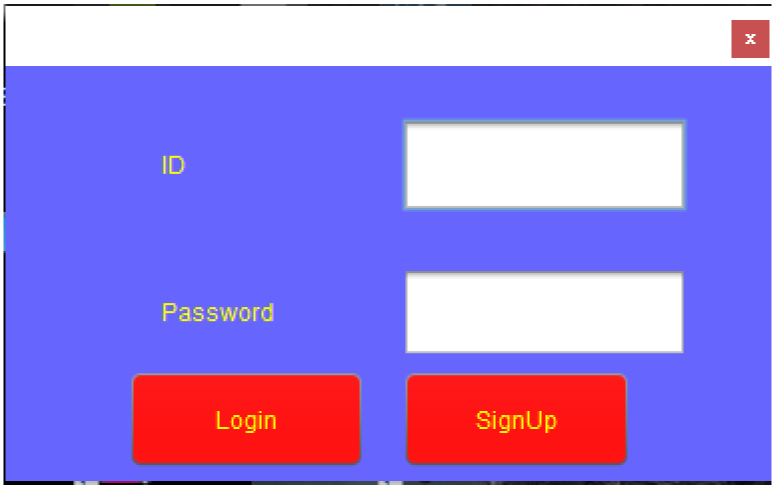
All the main information is gathered by Brain Storming. Although some questioners are done mainly for gathering data about whether this system is useful or not for gamers.

13. Mockups

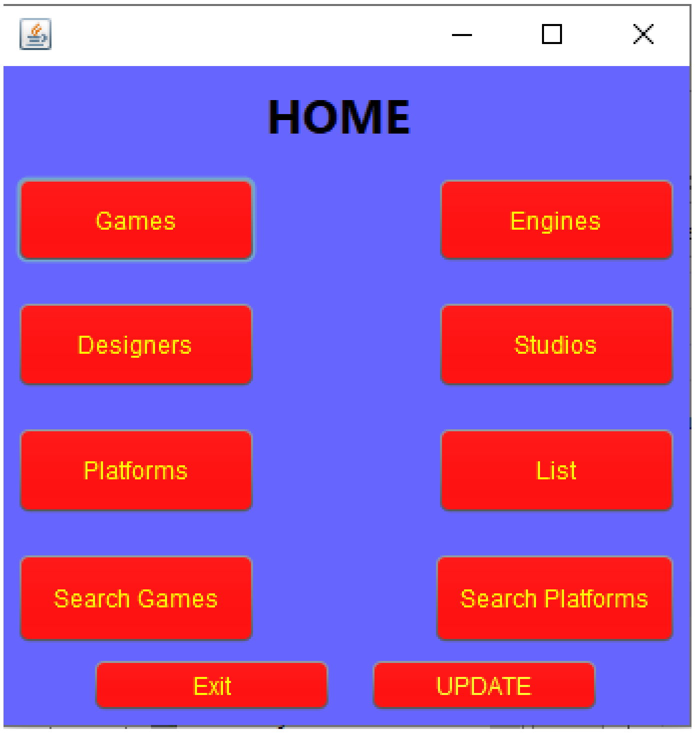
1. *SIGNUP*



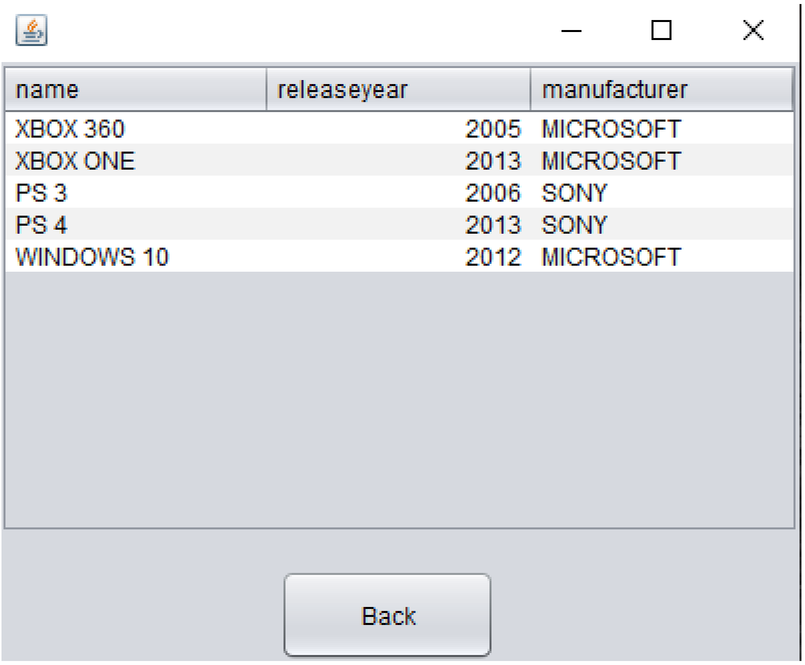
2. LOGIN



3. HOME

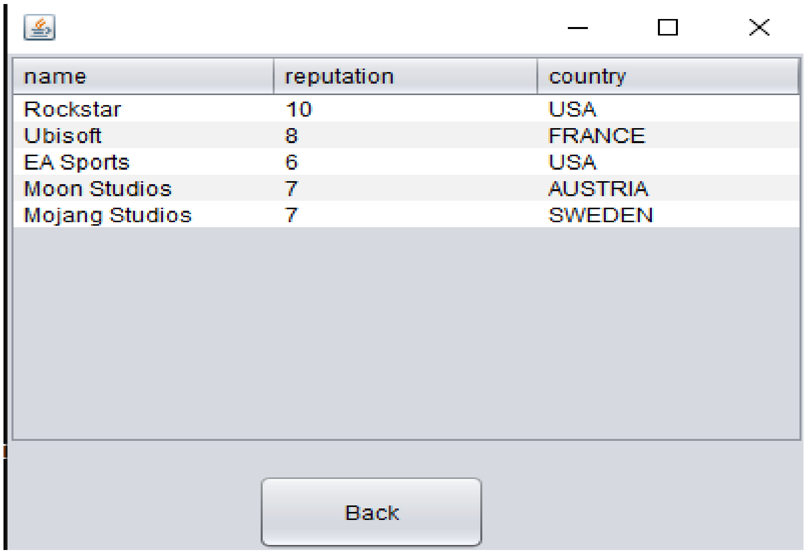


4. PLATFORMS



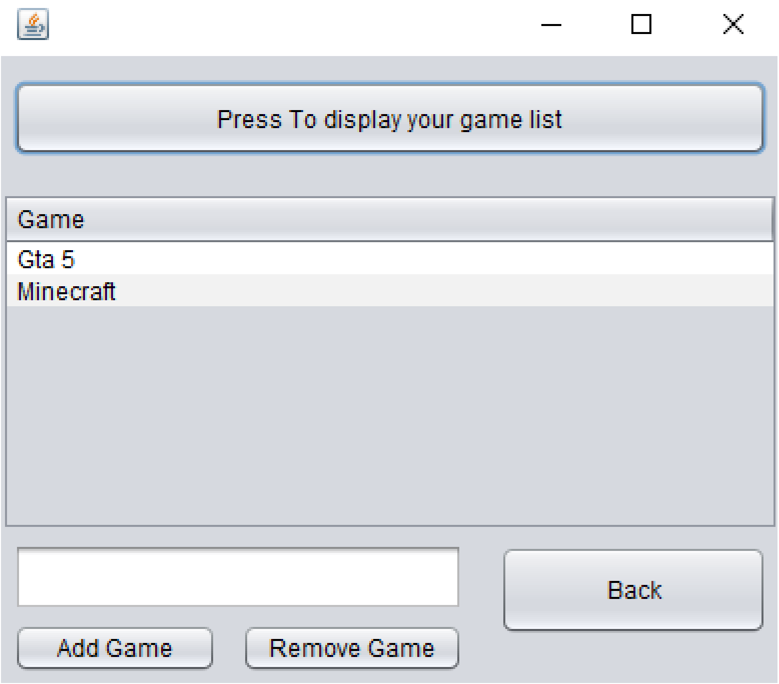
name	releaseyear	manufacturer
XBOX 360	2005	MICROSOFT
XBOX ONE	2013	MICROSOFT
PS 3	2006	SONY
PS 4	2013	SONY
WINDOWS 10	2012	MICROSOFT

5. STUDIOS



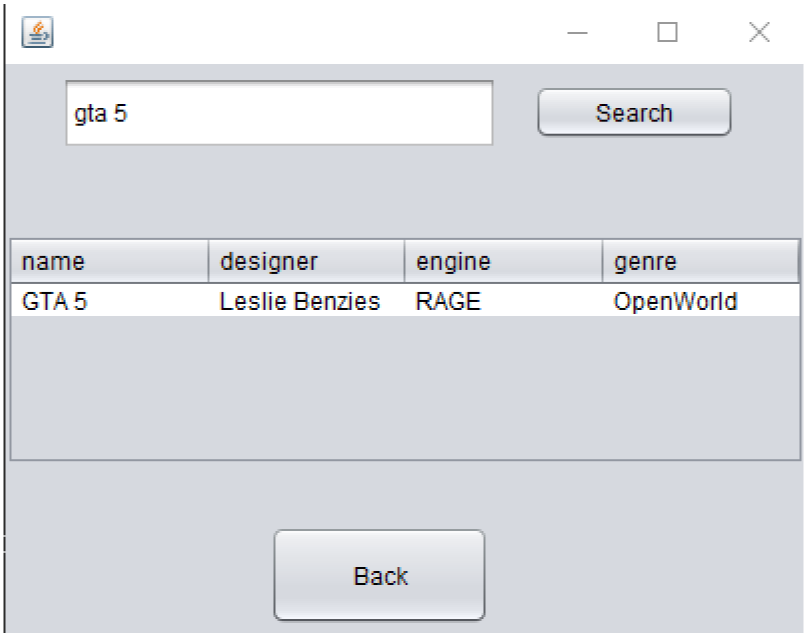
name	reputation	country
Rockstar	10	USA
Ubisoft	8	FRANCE
EA Sports	6	USA
Moon Studios	7	AUSTRIA
Mojang Studios	7	SWEDEN

6. LIST



Game
Gta 5
Minecraft

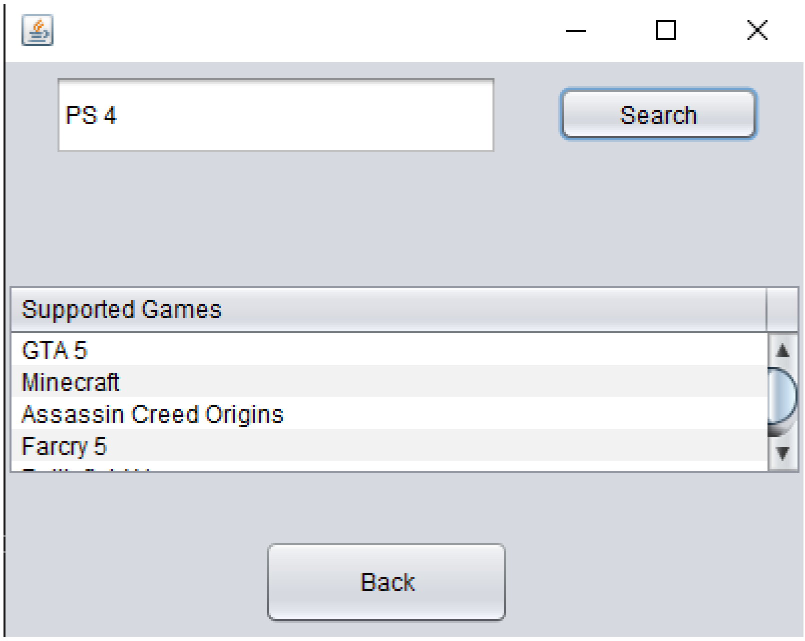
7. SEARCH GAMES



gta 5

name	designer	engine	genre
GTA 5	Leslie Benzies	RAGE	OpenWorld

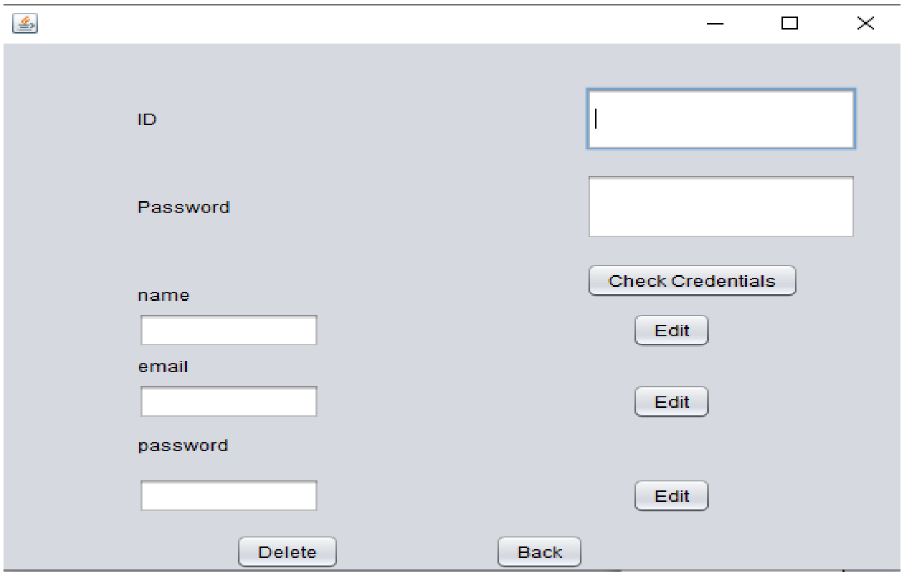
8. SEARCH PLATFORMS



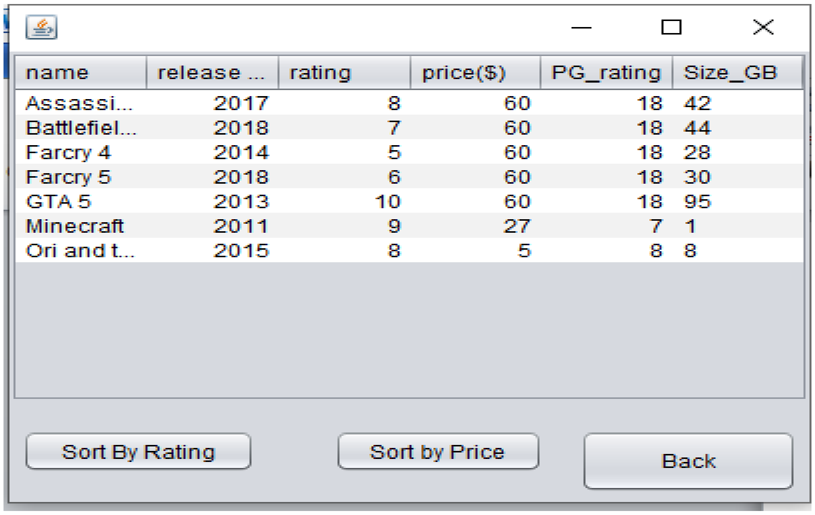
PS 4

Supported Games
GTA 5
Minecraft
Assassin Creed Origins
Farcry 5

9. UPDATE

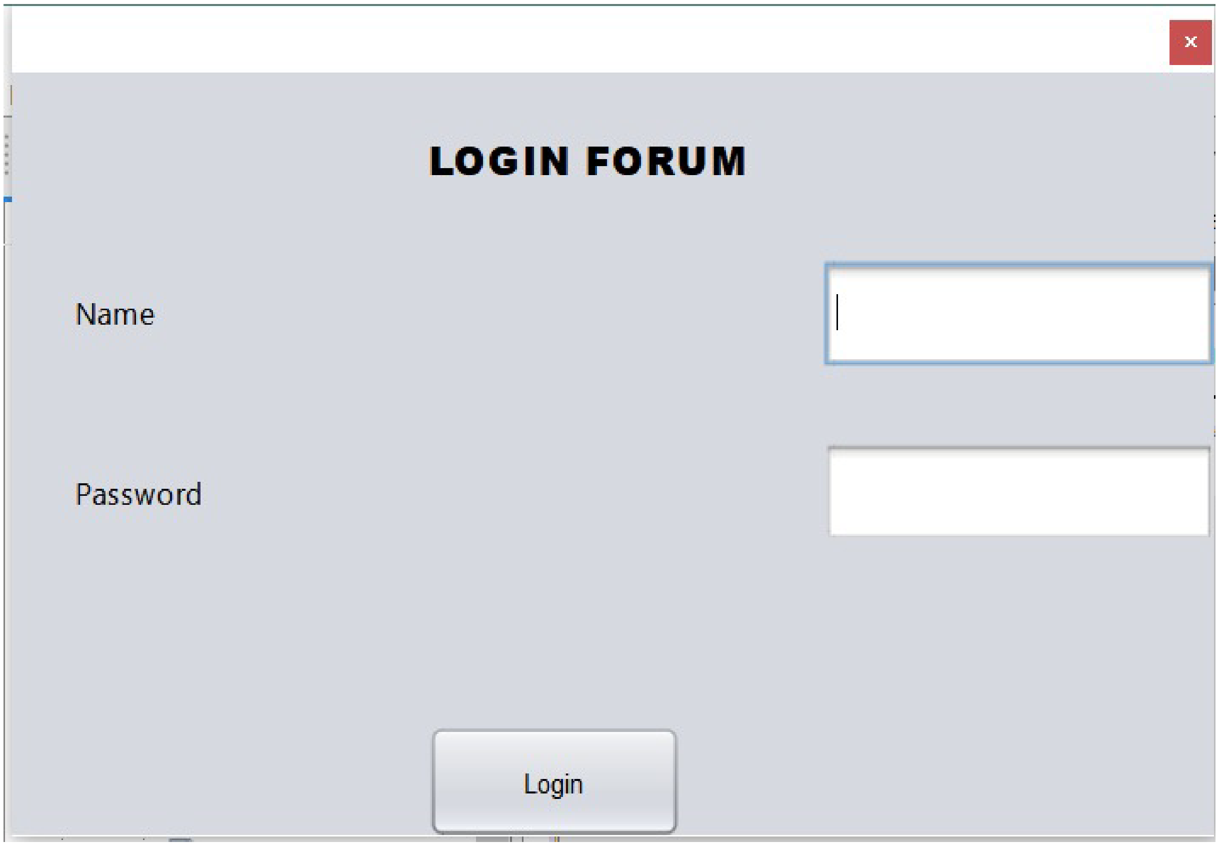


10.GAMES

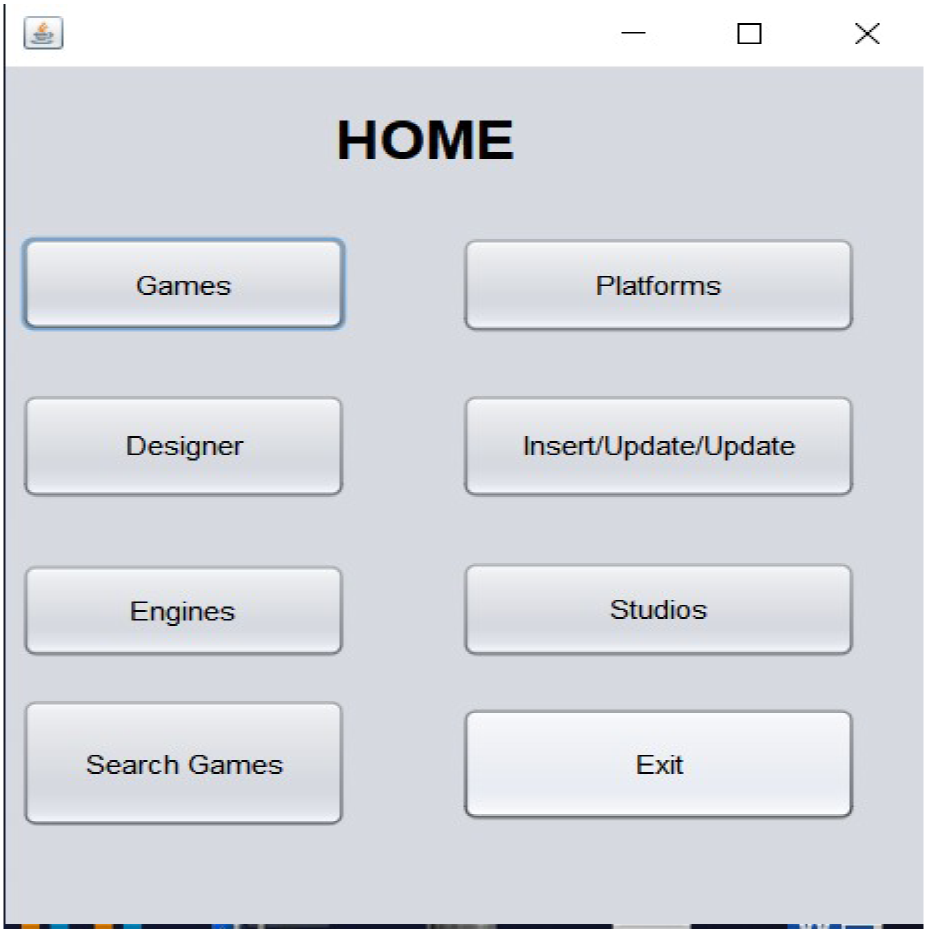


name	release ...	rating	price($)	PG_rating	Size_GB
Assassi...	2017	8	60	18	42
Battlefiel...	2018	7	60	18	44
Farcry 4	2014	5	60	18	28
Farcry 5	2018	6	60	18	30
GTA 5	2013	10	60	18	95
Minecraft	2011	9	27	7	1
Ori and t...	2015	8	5	8	8

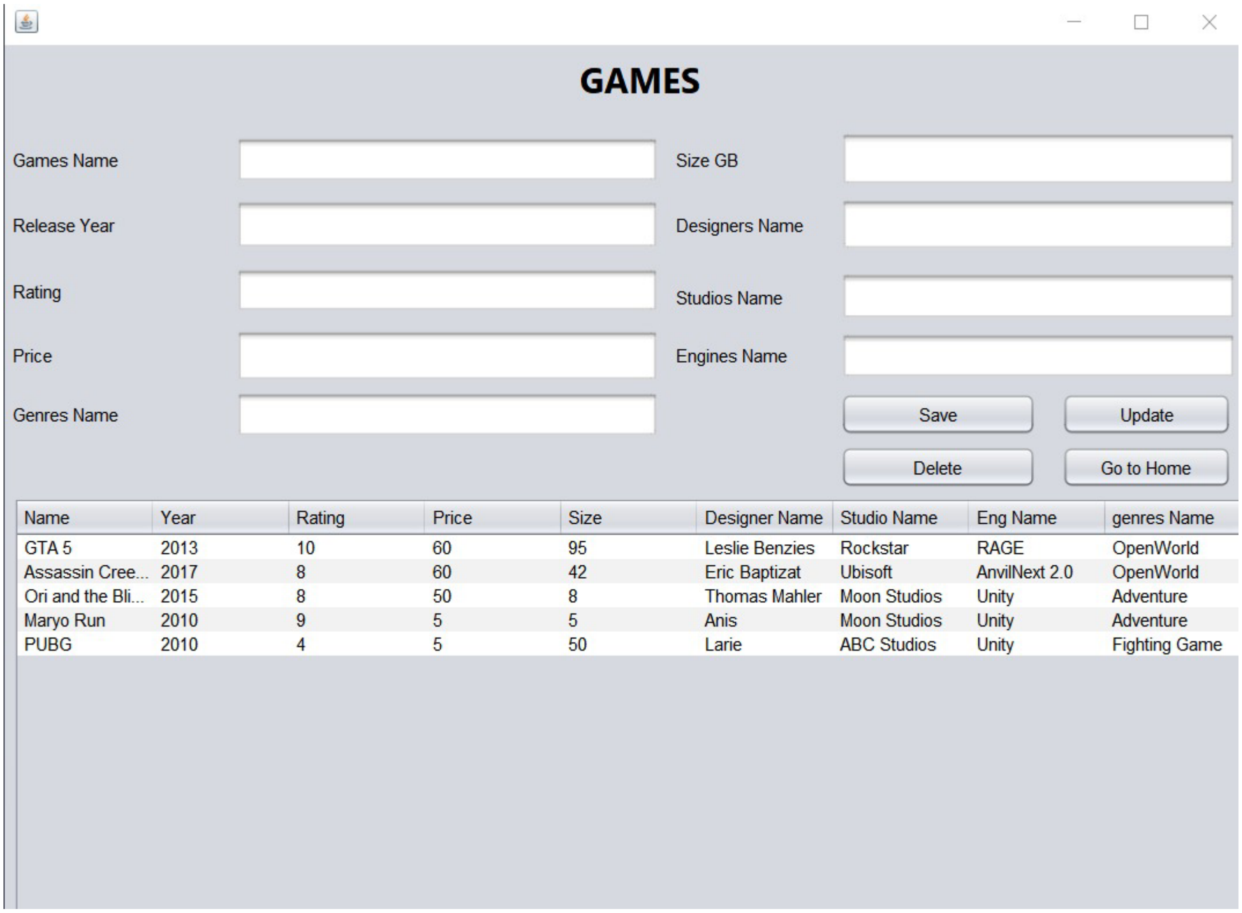
11.MONGO LOGIN



12. HOME

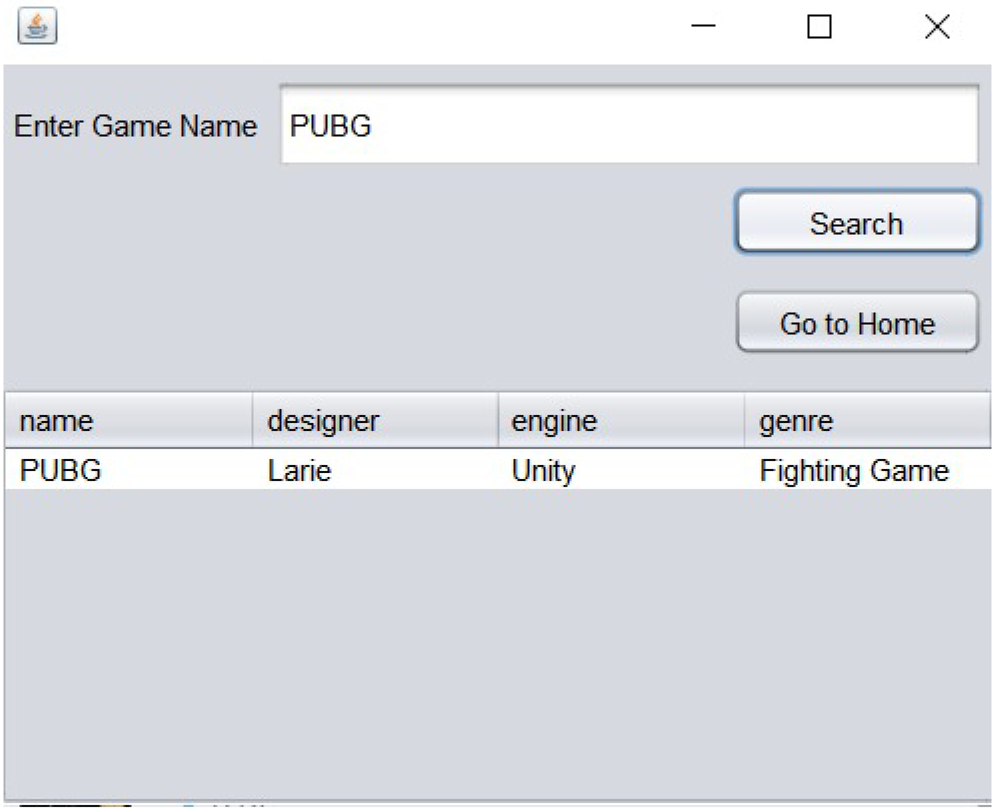

HOME
Games
Platforms
Designer
Insert/Update/Update
Engines
Studios
Search Games
Exit

13. INSERT



Name	Year	Rating	Price	Size	Designer Name	Studio Name	Eng Name	genres Name
GTA 5	2013	10	60	95	Leslie Benzies	Rockstar	RAGE	OpenWorld
Assassin Cree...	2017	8	60	42	Eric Baptizat	Ubisoft	AnvilNext 2.0	OpenWorld
Ori and the Bli...	2015	8	50	8	Thomas Mahler	Moon Studios	Unity	Adventure
Maryo Run	2010	9	5	5	Anis	Moon Studios	Unity	Adventure
PUBG	2010	4	5	50	Larie	ABC Studios	Unity	Fighting Game

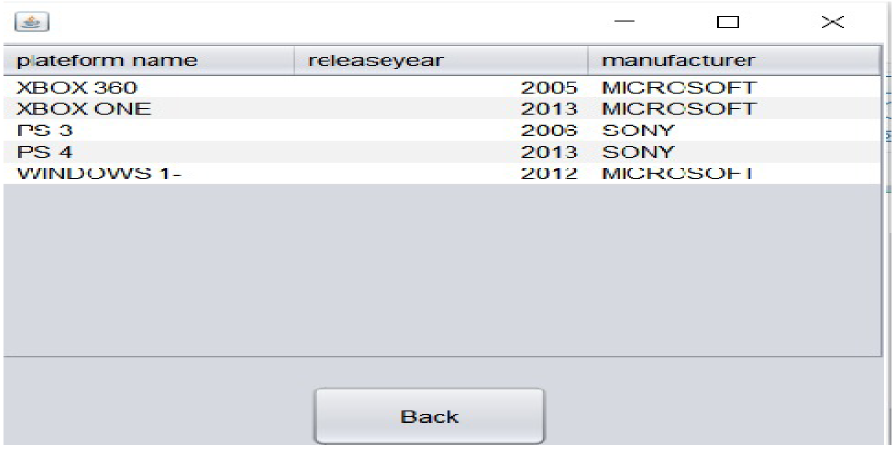
14. SEARCH



Enter Game Name: PUBG

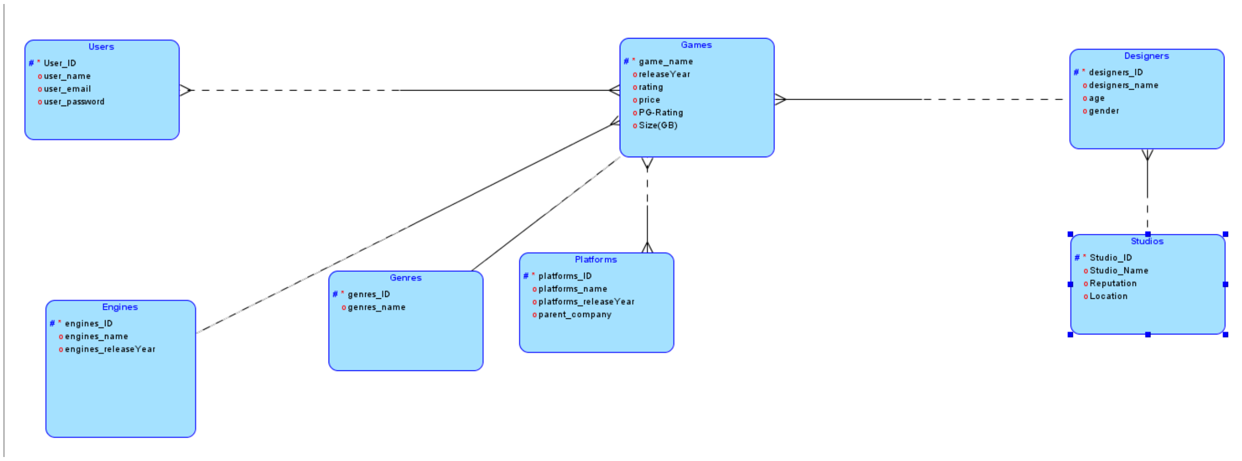
name	designer	engine	genre
PUBG	Larie	Unity	Fighting Game

15. PLATFORMS

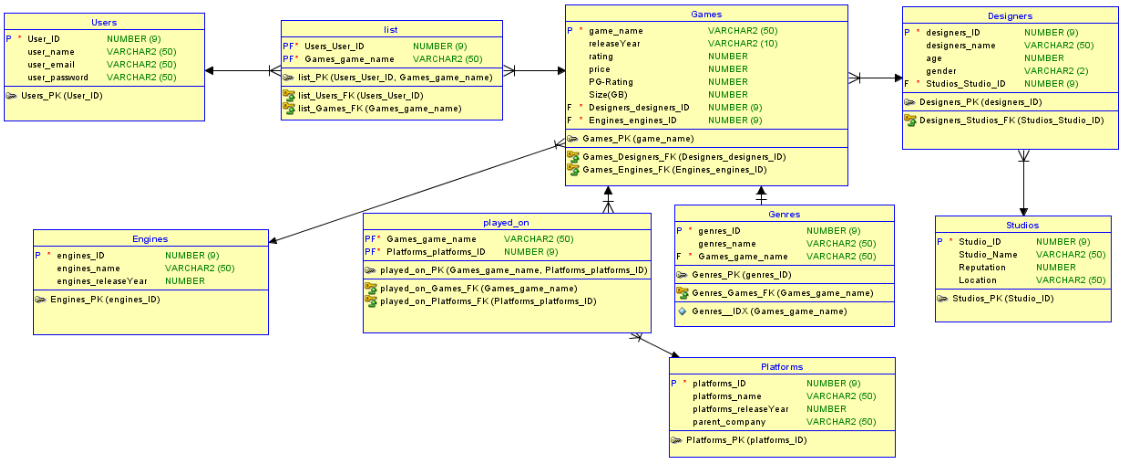


plateform name	releaseyear	manufacturer
XBOX 360	2005	MICROSOFT
XBOX ONE	2013	MICROSOFT
PS 3	2006	SONY
PS 4	2013	SONY
WINDOWS 1-	2012	MICROSOFT

14. ER DIAGRAM



15. RELATIONAL SCHEMA


Users
P * User_ID NUMBER (9)
user_name VARCHAR2 (50)
user_email VARCHAR2 (50)
user_password VARCHAR2 (50)
Users_PK (User_ID)
list
PF* Users_User_ID NUMBER (9)
PF* Games_game_name VARCHAR2 (50)
list_PK (Users_User_ID, Games_game_name)
list_Users_FK (Users_User_ID)
list_Games_FK (Games_game_name)
Games
P * game_name VARCHAR2 (50)
releaseYear VARCHAR2 (10)
rating NUMBER
price NUMBER
PG-Rating NUMBER
Size(GB) NUMBER
F * Designers_designers_ID NUMBER (9)
F * Engines_engines_ID NUMBER (9)
Games_PK (game_name)
Games_Designers_FK (Designers_designers_ID)
Games_Engines_FK (Engines_engines_ID)
Designers
P * designers_ID NUMBER (9)
designers_name VARCHAR2 (50)
age NUMBER
gender VARCHAR2 (2)
F * Studios_Studio_ID NUMBER (9)
Designers_PK (designers_ID)
Designers_Studios_FK (Studios_Studio_ID)
Engines
P * engines_ID NUMBER (9)
engines_name VARCHAR2 (50)
engines_releaseYear NUMBER
Engines_PK (engines_ID)
played_on
PF* Games_game_name VARCHAR2 (50)
PF* Platforms_platforms_ID NUMBER (9)
played_on_PK (Games_game_name, Platforms_platforms_ID)
played_on_Games_FK (Games_game_name)
played_on_Platforms_FK (Platforms_platforms_ID)
Genres
P * genres_ID NUMBER (9)
genres_name VARCHAR2 (50)
F * Games_game_name VARCHAR2 (50)
Genres_PK (genres_ID)
Genres_Games_FK (Games_game_name)
Genres__IDX (Games_game_name)
Studios
P * Studio_ID NUMBER (9)
Studio_Name VARCHAR2 (50)
Reputation NUMBER
Location VARCHAR2 (50)
Studios_PK (Studio_ID)
Platforms
P * platforms_ID NUMBER (9)
platforms_name VARCHAR2 (50)
platforms_releaseYear NUMBER
parent_company VARCHAR2 (50)
Platforms_PK (platforms_ID)

16. SCRIPT

```
-- Generated by Oracle SQL Developer Data Modeler 21.2.0.183.1957
--   at:        2021-12-10 21:11:14 PKT
--   site:      Oracle Database 21c
--   type:      Oracle Database 21c
-- predefined type, no DDL - MDSYS.SDO_GEOMETRY

-- predefined type, no DDL - XMLTYPE

CREATE TABLE designers (
    designers_id      NUMBER(9) NOT NULL,
    designers_name    VARCHAR2(50),
    age               NUMBER,
    gender            VARCHAR2(2),
    studios_studio_id NUMBER(9) NOT NULL
);

ALTER TABLE designers ADD CONSTRAINT designers_pk PRIMARY KEY ( designers_id );

CREATE TABLE engines (
    engines_id          NUMBER(9) NOT NULL,
    engines_name        VARCHAR2(50),
    engines_releaseyear NUMBER
);

ALTER TABLE engines ADD CONSTRAINT engines_pk PRIMARY KEY ( engines_id );

CREATE TABLE games (
    game_name              VARCHAR2(50) NOT NULL,
    releaseyear            VARCHAR2(10),
    rating                 NUMBER,
    price                  NUMBER,
    "PG-Rating"            NUMBER,
    "Size(GB)"             NUMBER,
    designers_designers_id NUMBER(9) NOT NULL,
    engines_engines_id     NUMBER(9) NOT NULL
);

ALTER TABLE games ADD CONSTRAINT games_pk PRIMARY KEY ( game_name );

CREATE TABLE genres (
    genres_id       NUMBER(9) NOT NULL,
    genres_name     VARCHAR2(50),
    games_game_name VARCHAR2(50) NOT NULL
);

CREATE UNIQUE INDEX genres__idx ON
    genres (
        games_game_name
    ASC );

ALTER TABLE genres ADD CONSTRAINT genres_pk PRIMARY KEY ( genres_id );

CREATE TABLE list (
    users_user_id   NUMBER(9) NOT NULL,
    games_game_name VARCHAR2(50) NOT NULL
);
```

```
ALTER TABLE list ADD CONSTRAINT list_pk PRIMARY KEY ( users_user_id,
                                                games_game_name );

CREATE TABLE platforms (
    platforms_id          NUMBER(9) NOT NULL,
    platforms_name        VARCHAR2(50),
    platforms_releaseyear NUMBER,
    parent_company        VARCHAR2(50)


);

ALTER TABLE platforms ADD CONSTRAINT platforms_pk PRIMARY KEY ( platforms_id );

CREATE TABLE played_on (
    games_game_name        VARCHAR2(50) NOT NULL,
    platforms_platforms_id NUMBER(9) NOT NULL
);

ALTER TABLE played_on ADD CONSTRAINT played_on_pk PRIMARY KEY ( games_game_name,
                                                          platforms_platforms_id );

CREATE TABLE studios (
    studio_id   NUMBER(9) NOT NULL,
    studio_name VARCHAR2(50)
--
    ,
    reputation  NUMBER,
    country     VARCHAR2 (50)
--

);

ALTER TABLE studios ADD CONSTRAINT studios_pk PRIMARY KEY ( studio_id );

CREATE TABLE users (
    user_id       NUMBER(9) NOT NULL,
    user_name     VARCHAR2(50),
    user_email    VARCHAR2(50),
    user_password VARCHAR2(50)
);

ALTER TABLE users ADD CONSTRAINT users_pk PRIMARY KEY ( user_id );

ALTER TABLE designers
    ADD CONSTRAINT designers_studios_fk FOREIGN KEY ( studios_studio_id )
        REFERENCES studios ( studio_id );

ALTER TABLE games
    ADD CONSTRAINT games_designers_fk FOREIGN KEY ( designers_designers_id )
        REFERENCES designers ( designers_id );

ALTER TABLE games
```

```
    ADD CONSTRAINT games_engines_fk FOREIGN KEY ( engines_engines_id )
        REFERENCES engines ( engines_id );

ALTER TABLE genres
    ADD CONSTRAINT genres_games_fk FOREIGN KEY ( games_game_name )
        REFERENCES games ( game_name );

ALTER TABLE list
    ADD CONSTRAINT list_games_fk FOREIGN KEY ( games_game_name )
        REFERENCES games ( game_name );

ALTER TABLE list
    ADD CONSTRAINT list_users_fk FOREIGN KEY ( users_user_id )
        REFERENCES users ( user_id );

ALTER TABLE played_on
    ADD CONSTRAINT played_on_games_fk FOREIGN KEY ( games_game_name )
        REFERENCES games ( game_name );

ALTER TABLE played_on
    ADD CONSTRAINT played_on_platforms_fk FOREIGN KEY ( platforms_platforms_id )
        REFERENCES platforms ( platforms_id );



-- Oracle SQL Developer Data Modeler Summary Report:
--
-- CREATE TABLE                             9
-- CREATE INDEX                             1
-- ALTER TABLE                             17
-- CREATE VIEW                              0
-- ALTER VIEW                               0
-- CREATE PACKAGE                           0
-- CREATE PACKAGE BODY                      0
-- CREATE PROCEDURE                         0
-- CREATE FUNCTION                          0
-- CREATE TRIGGER                           0
-- ALTER TRIGGER                            0
-- CREATE COLLECTION TYPE                   0
-- CREATE STRUCTURED TYPE                   0
-- CREATE STRUCTURED TYPE BODY              0
-- CREATE CLUSTER                           0
-- CREATE CONTEXT                           0
-- CREATE DATABASE                          0
-- CREATE DIMENSION                         0
-- CREATE DIRECTORY                         0
-- CREATE DISK GROUP                        0
-- CREATE ROLE                              0
-- CREATE ROLLBACK SEGMENT                  0
-- CREATE SEQUENCE                          0
-- CREATE MATERIALIZED VIEW                 0
-- CREATE MATERIALIZED VIEW LOG             0
-- CREATE SYNONYM                           0
-- CREATE TABLESPACE                        0
-- CREATE USER                          0
--
-- DROP TABLESPACE                      0
-- DROP DATABASE                        0
--
-- REDACTION POLICY                     0
--
-- ORDS DROP SCHEMA                     0
-- ORDS ENABLE SCHEMA                   0
-- ORDS ENABLE OBJECT                   0
--
-- ERRORS                               0
-- WARNINGS                             0
```

17. SAMPLE JSON DOCUMENT

Our Document has 6 collections

Platforms:

```
{
   "plateform_name": "",
   "releaseyear": ,
   "manufacturer": ""
}
```

Videogames:

```
{
   "game_name": " ",
   "releaseyear": "  ",
   "rating":,
   "price": ,
   "Size_GB": ,
   "designers_name": "  ",
   "engines_name": " ",
   "genres_name": " ",
   "studio_name": " "
}
```

Designers

```
{
   "designers_name": "Leslie Benzies",
   "Age": 50,
   "Gender": "M"
}
```

Users

```
{
   "User_name": " ",
   "User_email": " ",
   "User_password": " "
}
```

Studio

```
{
   "Name": "Rockstar",
   "Reputation": "10",
   "Country": "USA"
}
```

Engines

```
{
   "engines_name": "Dunia",
   "releaseyear": 2006
}
```

Games

```
{
   "game_name": "GTA 5",
   "releaseyear": "2013",
   "rating": 10,
   "price": 60,
   "Size_GB": 95,
   "designers_name": [" ", " ", " "],
   "engines_name": "RAGE",
   "genres_name": " ",
   "studio_name": [" ", " "]
}
```

18. Normalization

We will take into consideration the studios table.
Here is the studios table.

Studio_id	**Studio_name**	**Reputation**	**Location**
1	Rockstar	10	NY,USA
2	Ubisoft	8	PARIS,FRANCE

1. FIRST NORMAL FORM

According to first normal form the attribute values should be atomic which means multivaluable attributes are not allowed. But here we can see that the column Location has multiple values so we have to fix it.

Studio_id	**Studio_name**	**Reputation**	**Country**	**City**
1	Rockstar	10	USA	NY
2	Ubisoft	8	FRANCE	PARIS

2. SECOND NORMAL FORM

According to second normal form there should be no partial dependency. Here Candidate key comprises of Studio_id only. So there is no case of partial dependency here. This table is in second normal form.

3. THIRD NORMAL FORM

Third normal form states that there should be no transitive dependency. Now in this table we can notice that the city is dependent on country which is a non-prime attribute which violates the no transitive dependency rule. We have to fix that.

Studio_id	**Studio_name**	**Reputation**	**Location_id**
1	Rockstar	10	1

2	Ubisoft	8	2

Location_id	Country	City
1	USA	NY
2	FRANCE	PARIS

4. BCNF

According to BCNF on the left side of every functional dependency there should only be candidate key.

Here FDs are as follows
Studio_id→ Studio_name

Studio_id→ Reputation

Studio_id→ Location_id

19. Queries

19.1 SQL

SIGNUP

insert into users(user_id,user_name,user_password,user_email)values(?,?,?,?)

LOGIN

Select * from users where user_id = ? and user_password = ?

PRICE

Select * from games order by price

Select * from games order by price DESC

RATING

Select * from games order by rating

Select * from games order by rating DESC

LIST

Select games_game_name from list where users_user_id = ?

STUDIOS

Select * from display_studios

```
create view display_studios as SELECT studio_name,reputation,country,city FROM studios ,
locations where locations.Location_id = studios.Location_id;
```

PLATFORMS

```
Select * from display_platforms
```

```
create view display_platforms as SELECT
platforms_name,platforms_releaseyear,parent_company FROM videogames.display_platforms;
```

ENGINES

```
Select * from display_engines
```

```
CREATE VIEW display_engines as SELECT ENGINES_Name,ENGINES_RELEASEYEAR FROM
videogames.engines;
```

DESIGNERS

```
Select * from display_designers
```

```
create view display_designers as SELECT designers_name,age,gender FROM
videogames.designers;
```

GAMES

```
Select * from display_games
```

```
create view display_games as SELECT GAME_NAME,RELEASEYEAR,price,PG_Rating,Size_GB
FROM videogames.games;
```

SEARCH

```
Select * from search where game_name = ?
```

```
Create View Search as Select games.game_name,

designers.designers_name,engines.engines_name,genres.genres_name
FROM games
JOIN designers
ON games.designers_designers_id = designers.designers_id
JOIN engines
ON games.engines_engines_id = engines.engines_id
JOIN genres
ON games.genres_id = genres.genres_id;
```

SEARCHPLATFORMS

```
Select game_name from search_platforms where platforms_name = ?
```

```
Create view search_platfroms as select games.game_name, platforms.platforms_name
From games
Join played_on
```

```
ON games.game_name = played_on.games_game_name
Join platforms
ON played_on.platforms_platforms_id = platforms.platforms_id;
```

UPDATE

```
Select * from users where user_id = ? and user_password = ?

UPDATE users SET user_name = ? where user_id = ? and user_password = ?

UPDATE users SET user_email = ? where user_id = ? and user_password = ?

UPDATE users SET user_password = ? where user_id = ? and user_password = ?

DELETE From users where user_id = ? and user_password = ?
```

19.2 MONGO-DB

```
db.Games.find().pretty();

db.Games.find({"game_name":"PUBG"}).pretty();

db.Games.find({$and:[{"game_name":"PUBG"},{"studio_name":"Moon Studios"}]}).pretty();

db.Games.find({$or:[{"game_name":"PUBG"},{"studio_name":"Ubisoft"}]}).pretty();

db.Games.updateOne({"game_name":"PUBG"},{$set:{"releaseyear":"2016",”Size_GB”:6}})

db.Games.deleteOne({"game_name":"PUBG"})

db.Games.remove({"releaseyear":"2016"})

db.Games.count({“price”: 60})

db.Games.find({price:{$lt:50}}).pretty()

db.Games.find({price:{$lte:50}}).pretty()

db.Games.find({price:{$gt:50}}).pretty()

db.Games.find({price:{$gte:50}}).pretty()
```