

University of British Columbia
Department of Computer Science
CPSC 304 2019 W2

Group Project - Implementation of a Relational Database

Project Title:	Games Database (FD and Normalization)
Project Milestone:	3

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above.

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

2. Functional Dependencies:

Hardware/DeviceType -> controls

GameID -> GName, Year, Genre

GName -> Year, Genre ***

Distributor -> PaymentMethod

GameID, DiName -> Price-given, publisher

GameID -> #player

GameID -> #player, Difficulty , Competitive/Casual

DName -> price_dlc

Cname -> Location

GameID -> CName

SIN -> PName, Email

TID -> Position, CName, Salary

Position -> Salary ***

ProfileID-> #Gametime, DateCreated, Name, Username

Username -> password, Email, Pname, SIN

3. Normalization

3NF

Primary keys: Underlined ; Foreign Key: Bolded

List of Tables: {Platform (Brand, Hardware/DeviceType, controls),

Game(GameID, GName),

GName(GName, Year, Genre),

Distributor(DiName, PaymentMethod),

Offered(GameID, DiName, Price_given, publisher),

PVP(GameID, #player),

PVE(GameID, #player, Difficulty, Competitive/Casual),

SupportedOn(Brand, Hardware/DeviceType, GameID),

DLC(DName, GameID, price_dlc),

Company(Cname, Location),

MadeBy(CName, GameID),

Person(PName, SIN, Email),

TeamWorksAt(TID, Position , CName),

Position(Position, Salary),

Consume(PName, SIN, GameID),

ProfileHas(ProfileID, #Gametime, DateCreated, Name, Username),

Account(Username, password, Email, Pname, SIN),

Supply (Username, Cname)}

4. SQL DDL:

```
create_table_Platform(  
  Brand CHAR(20),  
  Hardware/DeviceType CHAR(20),  
  controls CHAR(20),  
  PRIMARY_KEY(Brand, Hardware/DeviceType)  
);
```

```
create_table_Game(  
  GameID INTEGER(20),  
  GName CHAR(20),  
  PRIMARY_KEY(GameID)  
);
```

```
create_table_GName(  
  GName CHAR(20),  
  Year INTEGER(20),  
  Genre CHAR(20),  
  PRIMARY_KEY(GName),  
  FOREIGN_KEY(GName) references from Game(GName),  
  ON DELETE CASCADE,  
  ON UPDATE CASCADE);
```

```
create_table_Distributor(  
  DiName CHAR(20),  
  PaymentMethod CHAR (20),  
  PRIMARY_KEY(DiName)  
);
```

```
create_table_Offered(  
  GameID INTEGER,  
  DiName CHAR(20),  
  Price_Given INTEGER,  
  publisher CHAR(20),  
  PRIMARY_KEY(GameID, DiName),  
  FOREIGN_KEY(GameID) reference from Game(GameID) ON DELETE CASCADE, ON UPDATE  
  CASCADE,  
  FOREIGN_KEY(DiName) reference from Distributor(DiName), ON DELETE CASCADE, ON UPDATE  
  CASCADE );
```

```
create_table_PVP(  
  GameID INTEGER,  
  #player INTEGER,  
  PRIMARY_KEY(GameID),  
  FOREIGN_KEY (GameID) reference from Game(GameID) ON DELETE CASCADE, ON UPDATE  
  CASCADE)
```

```
create_table_PVE (  
  GameID INTEGER,  
  #player INTEGER,  
  Difficulty CHAR(20),  
  Competitive/Casual CHAR(20),  
  PRIMARY_KEY(GameID),  
  FOREIGN_KEY (GameID) reference from Game(GameID) ON DELETE CASCADE ON UPDATE  
  CASCADE)
```

```
create_table_SupportedOn(  
  Brand CHAR(20),  
  Hardware/DeviceType CHAR(20),  
  GameID INTEGER,  
  PRIMARY_KEY (Brand, Hardware/DeviceType, GameID),  
  FOREIGN_KEY(Brand, Hardware/DeviceType) reference from Platform(Brand, Hardware/DeviceType), ON  
  DELETE CASCADE, ON UPDATE CASCADE,  
  ForeignKey (GameID) reference from Game(GameID), ON DELETE CASCADE, ON UPDATE CASCADE )
```

```
create_table_DLC (  
  DName CHAR(20),  
  GameID INTEGER,  
  price_dlc INTEGER,  
  PRIMARY_KEY(DName, GameID),  
  FOREIGN_KEY reference from Game(GameID), ON DELETE CASCADE, ON UPDATE CASCADE)
```

```
create_table_Company (  
  Cname CHAR(20),  
  Location CHAR(20),  
  PRIMARY KEY(Cname))
```

```
create_table_MadeBy(  
  CName CHAR(20),  
  GameID INTEGER,  
  PRIMARY_KEY (CName, GameID),  
  FOREIGN_KEY(CName) reference from Company(CName) ON DELETE CASCADE, ON UPDATE  
  CASCADE,  
  FOREIGN_KEY (GameID) reference from Game(GameID) ON DELETE CASCADE, ON UPDATE  
  CASCADE)
```

```
create_table_Person(  
  PName CHAR(20),  
  SIN INTEGER,  
  Email CHAR(20),  
  PRIMARY_KEY (PName, SIN))
```

```
create_table_TeamWorksAt(  
  TID INTEGER,  
  Position CHAR(20),  
  CName CHAR(20),  
  PRIMARY_KEY (TID),  
  FOREIGN_KEY (CName) reference from Company( CName) ON DELETE CASCADE, ON UPDATE  
  CASCADE)
```

```
create_table_Position(  
  Position CHAR(20),  
  Salary INTEGER,  
  PRIMARY_KEY(Position))
```

```
create_table_Consume(  
  PName CHAR(20),  
  SIN INTEGER,  
  GameID INTEGER,  
  PRIMARY_KEY (PName, SIN, GameID),  
  FOREIGN_KEY (PName, SIN) reference from Person(PName, SIN) ON DELETE CASCADE, ON UPDATE  
  CASCADE,  
  FOREIGN_KEY (GameID) reference from Game(GameID) ON UPDATE CASCADE, ON DELETE  
  CASCADE)
```

```
create_table_ProfileHas (  
  ProfileID INTEGER,  
  #Gametime INTEGER,  
  DateCreated DATE, Name CHAR(20),  
  Username CHAR(20),  
  PRIMARY_KEY (ProfileID),  
  FOREIGN_KEY (Username) reference from Account(Username) ON DELETE CASCADE, ON UPDATE  
  CASCADE)
```

```
create_table_Account(  
  Username CHAR(20),  
  password CHAR(20),  
  Email CHAR(20),  
  PName CHAR(20),  
  SIN INTEGER,  
  PRIMARY_KEY(Username),  
  FOREIGN_KEY(PName, SIN) reference from Person(PName, SIN) ON DELETE CASCADE, ON UPDATE  
  CASCADE)
```

```
create_table_Supply(  
  Username CHAR(20),  
  Cname CHAR(20),  
  PRIMARY_KEY(Username, Cname),  
  FOREIGN_KEY (Username) reference from Account(Username), ON DELETE CASCADE, ON  
  UPDATE CASCADE,  
  FOREIGN_KEY (Cname) reference from Company(CName), ON DELETE CASCADE, ON UPDATE  
  CASCADE)
```

5. Populate Tables:

Platform

Brands	Device/Hardware Type	Controls
Mojang	PC	Keyboard
Valve	PC	Keyboard
BlueHole	PC	Keyboard
Bizzard	PC	Keyboard
Nintendo	Switch	Joycon
EA	PC	Keyboard
Capcom	PC	Keyboard
Riot	PC	Keyboard

Game

GameID	Gname
1	Minecraft
2	League of Legends
3	DOTA2
4	PUBG
5	WOW
6	Overwatch
7	Breadth of the Wild
8	Plants vs Zombies
9	CSGO
10	Monster Hunter

GName

Gname	Year	Genre
Minecraft	2009	ADVENTURE
League of Legends	2009	MOBA
DOTA2	2011	MOBA
PUBG	2016	BATTLE ROYALE
WOW	2000	MMO RPG
Overwatch	2017	FPS
Breadth of the Wild	2018	ADVENTURE
Plants vs Zombies	2009	TOWER DEFENCE
CSGO	2012	FPS
Monster Hunter	2019	RPG

Distributor

DiName	PaymentMethod
Valve	Online
Sony	Online
Mojang	Online
Riot Games	Online
Steam	Online
Battlenet	Online
e-shop	Online

Offered

GameID	DiName	Price_given	Publisher
	1 Mojang	25	Mojang
	2 Riot Games	FREE	Riot Games
	3 Valve	FREE	Valve
	4 Steam	49.99	Blue hole
	5 Battlenet	FREE	Blizzard

PVP

GameID	#player
2	10
3	10
4	99
6	12
9	10

PVE

GameID	#player	Difficulty	Competitive/Casual
1	1	Normal	Casual
5	40	Hard	Competitive
7	1	Normal	Casual
8	1	Easy	Casual
10	4	Normal	Competitive

SupportedOn

Brand	Hardware/DeviceType	GameID
Mojang	PC	1
Riot Games	PC	2
Valve	PC	3
Bluehole	PC	4
Blizzard	PC	5

DLC

Dname	GameID	price_dlc
WOW : Burning Crusade		40
WOW : Wrath of the Lich King		40
WOW :Cataclysm		40
WOW :Mists of Pandaria		40
WOW :Warlords of Draenor		40

Company

Cname	Location
Mojang	Sweden
Riot Games	USA
Valve	USA
Bluehole	Korea
Blizzard	USA

MadeBy

Cname	GameID
Mojang	1
Riot Games	2
Valve	3
Bluehole	4
Blizzard	5

Person

Cname	GameID
Mojang	1
Riot Games	2
Valve	3
Bluehole	4
Blizzard	5

TeamWorksAt

TID	Position	Cname
	1 Manager	Mojang
	2 Marketing	Mojang
	3 Intern	Mojang
	4 Analyst	Mojang
	5 Assistant Manager	Mojang

Position

Position	Salary
Manager	100k
Marketing	80k
Intern	30k
Analyst	70k
Assistant Manager	80k

Consume

Position	Salary
Manager	100k
Marketing	80k
Intern	30k
Analyst	70k
Assistant Manager	80k

ProfileHas

ProfileID	#Gametime	DateCreated	Name	Username
123	10	2011-10-24	UserPeter	Peter001
234	23	2011-10-25	UserJillian	Jillian001
345	34	2011-10-26	UserYinchen	Yinchen001
456	45	2011-10-27	UserHazra	Hazra001
567	56	2011-10-28	UserJessica	Jessica001

Account

Username	password	Email	Pname	SIN
Peter001	password123	peter@gmail.com	Peter	123456789
Jillian001	password124	jillian@gmail.com	Jillian	234567890
Yinchen001	password125	yinchen@gmail.com	Yinchen	345678901
Hazra001	password126	hazra@gmail.com	Hazra	456789012
Jessica001	password127	jessica@gmail.com	Jessica	567890123

Supply

Username	Cname
Peter001	Riot Games
Jillian001	Riot Games
Yinchen001	Valve
Hazra001	Riot Games
Jessica001	Riot Games