

# CPSC 304 Project Cover Page

Milestone #: 2

Date: 04 - Mar - 2021

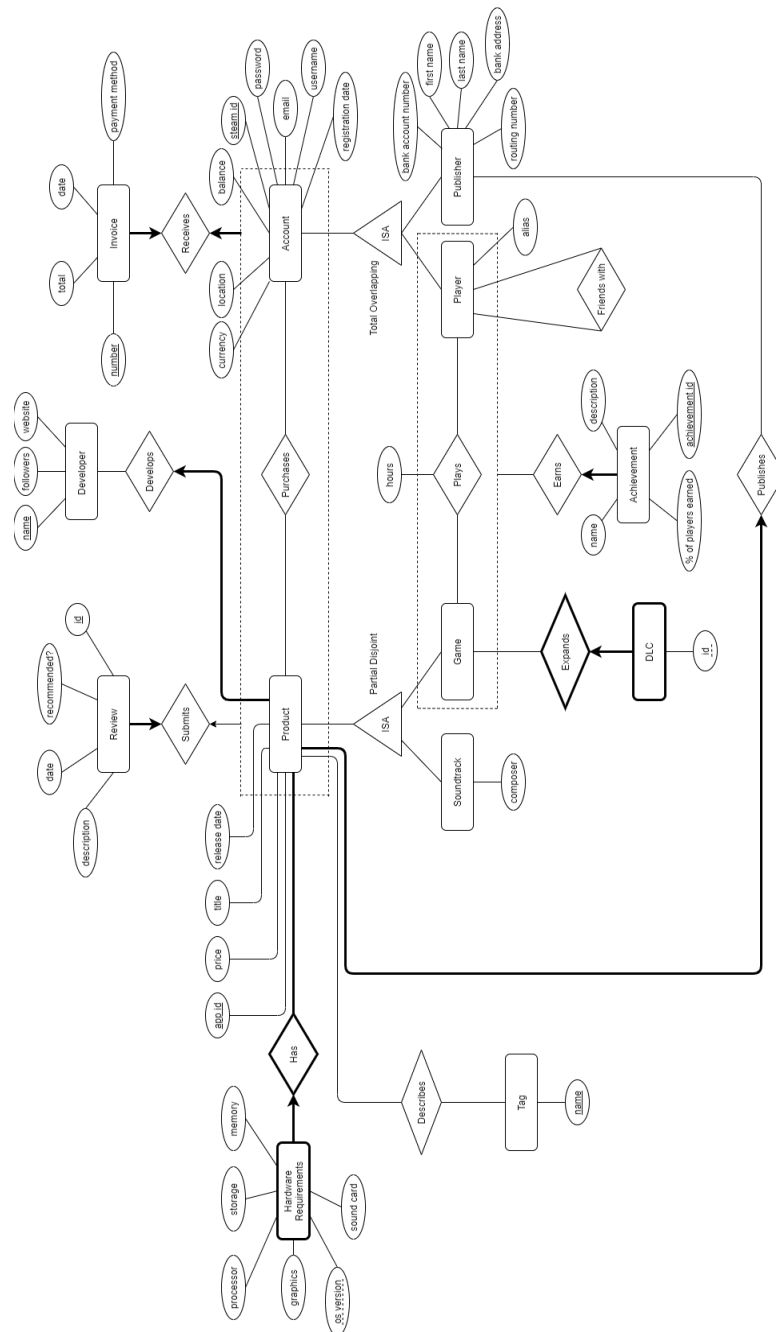
Group Number: 73

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Kathrina Pillay	61163531	s3e2b	kathrinapillay@gmail.com
Katherine Lima	45726122	g0k8	kitkathy1994@gmail.com
Theodorus Susanto	37452802	v9y1b	jossoey84@gmail.com

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 the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

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

## QUESTION 2



CHANGE 1: Removed 'time' attribute from 'Invoice' entity because Oracle's DATE datatype records both the date and time in 'date' attribute.

CHANGE 2: Added 'country' and 'currency' attributes to 'Account' entity in order to have a meaning FD for a second normalization process.

**QUESTION 3** (PK = Underlined, FK = Bolded)

Product(appID:NUMBER, **developerName**:VARCHAR(100) NOT NULL,  
**publisherSteamID**:NUMBER NOT NULL, price:NUMBER, title:VARCHAR(100), releaseDate:DATE)  
Candidate keys: (developerName, title) (publisherSteamID, title)

Soundtrack(appID:NUMBER, composer:VARCHAR(100))

DLC\_Expands(appID:NUMBER, dlcID:NUMBER)

HardwareRequirements(appID:NUMBER, osVersion:VARCHAR(100), soundCard:VARCHAR(100),  
graphics:VARCHAR(100), processor:VARCHAR(100), storage:VARCHAR(100),  
memory:VARCHAR(100))

Tag(tagName:VARCHAR(100))

Describes(tagName:VARCHAR(100), appID:NUMBER)

Developer(devName:VARCHAR(100), followers:NUMBER, website:VARCHAR(100))  
Candidate keys: (website)

Purchases(appID:NUMBER, steamID:NUMBER, **invoiceNumber**:NUMBER NOT NULL)

Account(steamID:NUMBER, balance:NUMBER, password:VARCHAR(100), email:VARCHAR(100)  
UNIQUE, username:VARCHAR(20) UNIQUE, registrationDate:DATE, currency:CHAR(3)  
country:CHAR(2))  
Candidate keys: (username) (email)

Review(reviewID:NUMBER, **appID**:NUMBER NOT NULL, **steamID**:NUMBER NOT NULL,  
recommended?:BOOLEAN, reviewDate:DATE, reviewDescription:VARCHAR(8000))  
Candidate keys: (appID, steamID)

Invoice(invoiceNumber:NUMBER, **appID**:NUMBER, **steamID**:NUMBER NOT NULL,  
total:NUMBER, invoiceDate:DATE, paymentMethod:VARCHAR(100))  
Candidate keys: (appID, steamID) (steamID, date)

Publisher(steamID:NUMBER, firstName:VARCHAR(50), lastName:VARCHAR(50),  
bankAccountNumber:NUMBER UNIQUE, bankAddress:VARCHAR(100),  
routingNumber:NUMBER)  
Candidate keys: (firstName, lastName, bankAccountNumber)

Player(steamID:NUMBER, alias:VARCHAR(20))

Plays(appID:NUMBER, steamID:NUMBER, hours:NUMBER)

FriendsWith(steamID:NUMBER, friendsID:NUMBER)

Achievement(achievementID:NUMBER, appID:NUMBER NOT NULL, steamID:NUMBER NOT NULL, percentOfPlayersEarned:NUMBER, description:VARCHAR(8000), name:VARCHAR(100))

## QUESTION 4

### Product

appID -> price, title, release date, developerName, publisherSteamID

developerName, title -> price, releaseDate, appID, publisherSteamID

publisherSteamID, title -> price, releaseDate, appID, developerName

### HardwareRequirements

appID, osVersion -> soundCard, graphics, processor, storage, memory

### Developer

devName -> followers, website

website -> devName, followers

### Purchases

appID, steamID -> invoiceNumber

invoiceNumber -> appID

### Account

steamID -> balance, password, email, username, registrationDate, country, currency

email -> steamID, balance, password, username, registrationDate, country, currency

username -> steamID, password, email, balance, registrationDate, country, currency

country -> currency

### Review

reviewID -> reviewDate, recommended?, reviewDescription, appID, steamID

appID, steamID -> reviewID, recommended?, reviewDate, reviewDescription

### Invoice

invoiceNumber -> appID, steamID, total, invoiceDate, paymentMethod

appID, steamID -> invoiceNumber, total, date, paymentMethod

steamID, date -> invoiceNumber, total, paymentMethod, appID

### Publisher

steamID -> firstName, lastName, bankAccountNumber, bankAddress, routingNumber

firstName, lastName, bankAccountNumber -> steamID, bankAddress, routingNumber

routingNumber -> bankAddress

**Plays**

applID, steamID -> hours

**Achievement**

achievementID -> applID, steamID, percentOfPlayersEarned, description, name

## QUESTION 5

**Product** is in BCNF

**HardwareRequirements** is in BCNF

**Developer** is in 3NF

**Purchases** is in 3NF

**Review** is in 3NF

**Invoice** is in 3NF

**Plays** is in BCNF

**Achievement** is in BCNF

**Account**

R (steamID, balance, password, email, username, registrationDate, country, currency)

FD:

steamID -> balance, password, email, username, registrationDate, country, currency

email -> steamID, balance, password, username, registrationDate, country, currency

username -> steamID, password, email, username, registrationDate, country, currency

country -> currency

R1 (country, currency), R2 (steamID, balance, password, email, username, registrationDate, **country**)

R1 = Locale, R2 = Account

**Publisher**

R (steamID, firstName, lastName, bankAccountNumber, bankAddress, routingNumber)

FD:

steamID -> firstName, lastName, bankAccountNumber, bankAddress, routingNumber

firstName, lastName, bankAccountNumber -> steamID, bankAddress, routingNumber

routingNumber -> bankAddress

R1 (routingNumber, bankAddress), R2 (steamID, routingNumber, firstName, lastName, bankAccountNumber)

R1 = BankInfo, R2 = Publisher

## QUESTION 6

```
CREATE TABLE Product (  
    appID          NUMBER,  
    developerName  VARCHAR(100) NOT NULL,  
    publisherSteamID NUMBER NOT NULL,  
    price          NUMBER,  
    title          VARCHAR(100),  
    releaseDate    DATE,  
    PRIMARY KEY (appID),  
    FOREIGN KEY (developerName)  
        REFERENCES Developer(devName)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE,  
    FOREIGN KEY (publisherSteamID)  
        REFERENCES Publisher(steamID)  
        ON DELETE CASCADE  
        ON UPDATE CASCADE,  
);
```

```
CREATE TABLE Soundtrack (  
    appID          NUMBER,  
    composer       VARCHAR(100),  
    PRIMARY KEY (appID),  
    FOREIGN KEY (appID)  
        REFERENCES Product  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
);
```

```
CREATE TABLE DLC_Expands (  
    appID NUMBER,  
    dlcID NUMBER,  
    PRIMARY KEY (appID, dlcID),  
    FOREIGN KEY (appID)  
        REFERENCES Product  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
);
```

```
CREATE TABLE HardwareRequirements (  
    appID          NUMBER,  
    osVersion      VARCHAR(100),  
    soundCard      VARCHAR(100),  
    graphics       VARCHAR(100),  
    processor      VARCHAR(100),  
    storage        VARCHAR(100),  
    memory         VARCHAR(100),  
    PRIMARY KEY (appID, osVersion),  
    FOREIGN KEY (appID)  
        REFERENCES Product  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
);
```

```
CREATE TABLE Tag (  
    tagName        VARCHAR(100),  
    PRIMARY KEY (tagName)  
);
```

```
CREATE TABLE Describes (  
    tagName        VARCHAR(100),  
    appID          NUMBER,  
    PRIMARY KEY (tagName, appID),  
    FOREIGN KEY (tagName)  
        REFERENCES Tag  
        ON DELETE SET NULL  
        ON UPDATE CASCADE,  
    FOREIGN KEY (appID)  
        REFERENCES Product  
        ON DELETE CASCADE  
        ON UPDATE CASCADE  
);
```

```
CREATE TABLE Developer (  
    devName        VARCHAR(100),  
    followers      NUMBER,  
    website        NUMBER,  
    PRIMARY KEY (devName)  
);
```

```
CREATE TABLE Purchases (  
    appID          NUMBER,
```

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```
steamID          NUMBER,
invoiceNumber    NUMBER NOT NULL,
PRIMARY KEY (appID, steamID),
FOREIGN KEY (appID)
    REFERENCES Product
    ON DELETE CASCADE
    ON UPDATE CASCADE,
FOREIGN KEY (steamID)
    REFERENCES Account
    ON DELETE CASCADE
    ON UPDATE CASCADE,
FOREIGN KEY (invoiceNumber)
    REFERENCES Invoice
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Account (
    steamID        NUMBER,
    balance         NUMBER,
    password        VARCHAR(100),
    email           VARCHAR(100) UNIQUE,
    username        VARCHAR(20) UNIQUE,
    registrationDate DATE,
    country         CHAR(2) DEFAULT 'US',
    PRIMARY KEY (steamID),
    FOREIGN KEY (country)
        REFERENCES Locale
        ON DELETE SET DEFAULT
        ON UPDATE CASCADE
);

CREATE TABLE Locale (
    country        CHAR(2),
    currency       CHAR(3),
    PRIMARY KEY (country)
);

CREATE TABLE Review (
    reviewID       NUMBER,
    appID          NUMBER NOT NULL,
    steamID        NUMBER NOT NULL,
    recommended?   CHAR(1),
```



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```
        reviewDate          DATE,
        reviewDescription   VARCHAR(8000),
        PRIMARY KEY (reviewID),
        FOREIGN KEY (appID)
            REFERENCES Product
            ON DELETE CASCADE
            ON UPDATE CASCADE,
        FOREIGN KEY (steamID)
            REFERENCES Account
            ON DELETE CASCADE
            ON UPDATE CASCADE
    );

CREATE TABLE Invoice (
    invoiceNumber           NUMBER,
    appID                   NUMBER NOT NULL DEFAULT '000000',
    steamID                 NUMBER NOT NULL DEFAULT '00000000000000000000',
    total                   NUMBER,
    invoiceDate             DATE,
    paymentMethod           VARCHAR(100),
    PRIMARY KEY (invoiceNumber),
    FOREIGN KEY (appID)
        REFERENCES Product
        ON DELETE SET DEFAULT
        ON UPDATE CASCADE,
    FOREIGN KEY (steamID)
        REFERENCES Account
        ON DELETE SET DEFAULT
        ON UPDATE CASCADE,
);

CREATE TABLE Publisher (
    steamID                 NUMBER,
    routingNumber           NUMBER,
    firstName               VARCHAR(50),
    lastName                VARCHAR(50),
    bankAccountNumber       NUMBER,
    PRIMARY KEY (steamID),
    FOREIGN KEY (steamID)
        REFERENCES Account
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (routingNumber)
```

```
REFERENCES BankInfo
ON DELETE SET NULL
ON UPDATE CASCADE,
);

CREATE TABLE BankInfo (
    routingNumber    NUMBER,
    bankAddress      VARCHAR(100),
    PRIMARY KEY (routingNumber)
);

CREATE TABLE Player (
    steamID          NUMBER,
    alias            VARCHAR(20),
    PRIMARY KEY (steamID),
    FOREIGN KEY (steamID)
        REFERENCES Account
        ON DELETE CASCADE
        ON UPDATE CASCADE
);

CREATE TABLE Plays (
    appID            NUMBER,
    steamID          NUMBER,
    hours            NUMBER
    PRIMARY KEY (appID, steamID),
    FOREIGN KEY (appID)
        REFERENCES Product
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (steamID)
        REFERENCES Account
        ON DELETE CASCADE
        ON UPDATE CASCADE
);

CREATE TABLE FriendsWith (
    steamID          NUMBER,
    friendsID        NUMBER,
    PRIMARY KEY (steamID, friendsID),
    FOREIGN KEY (steamID)
        REFERENCES Account
        ON DELETE CASCADE
```

```
        ON UPDATE CASCADE,
FOREIGN KEY (friendsID)
REFERENCES Account(steamID)
ON DELETE CASCADE
ON UPDATE CASCADE
);

CREATE TABLE Achievement (
    achievementID          NUMBER,
    appID                  NUMBER NOT NULL,
    steamID                NUMBER NOT NULL,
    percentOfPlayersEarned NUMBER,
    description             VARCHAR(8000),
    name                   VARCHAR(100),
    PRIMARY KEY (achievementID),
    FOREIGN KEY (appID)
        REFERENCES Product
        ON DELETE CASCADE
        ON UPDATE CASCADE,
    FOREIGN KEY (steamID)
        REFERENCES Account
        ON DELETE CASCADE
        ON UPDATE CASCADE
);
```

## QUESTION 7

### Product

appID	developerName	publisherSteamID	price	title	releaseDate
105600	Re-Logic	18512157936190700	10.99	Terraria	2011-05-16
409210	Re-Logic	18512157936190734	5.69	Terraria: Official Soundtrack	2015-10-13
113200	Edmund McMillen and Florian Himsl	29149147156919113	5.49	The Binding of Isaac	2011-09-28
113204	Edmund McMillen and Florian Himsl	29149147156919113	3.29	The Binding of Isaac: Wrath of the Lamb	2012-05-28
1091500	CD Projekt Red	23899509526857143	79.99	Cyberpunk 2077	2020-12-09
1228810	Forgotten Empires, Tantalus Media, Wicked Witch	60485693251700274	11.49	Age of Empires II: Definitive Edition Soundtrack	2020-01-23
1275570	AMPLITUDE Studios	59986018078832402	3.30	Endless Space 2 - Harmonic Memories Soundtrack	2020-07-03

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548430	Ghost Ship Games	24675031984263507	34.99	Deep Rock Galactic'	2020-05-13
281990	Paradox Development Studio	30672011703269611	43.99	Stellaris	2016-05-09
492740	Paradox Development Studio	30672011703269611	7.79	Stellaris: Complete Soundtrack	2016-07-12

INSERT

```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (105600, 'Re-Logic', 18512157936190734, 10.99, 'Terraria', TO_DATE('2011-05-16',
'YYYY-MM-DD'))
);
```

INSERT

```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (409210, 'Re-Logic', 18512157936190734, 5.69, 'Terraria: Official Soundtrack',
TO_DATE('2015-10-13', 'YYYY-MM-DD'))
);
```

INSERT

```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (113200, 'Edmund McMillen and Florian Himsl', 29149147156919113, 5.49, 'The
Binding of Isaac', TO_DATE('2011-09-28', 'YYYY-MM-DD'))
);
```

INSERT

```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (113204, 'Edmund McMillen and Florian Himsl', 29149147156919113, 3.29, 'The
Binding of Isaac: Wrath of the Lamb', TO_DATE('2012-05-28', 'YYYY-MM-DD'))
);
```

INSERT

```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (1091500, 'CD Projekt Red', 23899509526857143, 79.99, 'Cyberpunk 2077',
TO_DATE('2020-12-09', 'YYYY-MM-DD'))
);
```

INSERT

```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (1228810, 'Forgotten Empires, Tantalus Media, Wicked Witch', 60485693251700274,
11.49, 'Age of Empires II: Definitive Edition Soundtrack', TO_DATE('2020-01-23', 'YYYY-MM-DD'))
);
```

INSERT

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```
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (1275570, 'AMPLITUDE Studios', 59986018078832402, 3.30, 'Endless Space 2 -
Harmonic Memories Soundtrack', TO_DATE('2020-07-03', 'YYYY-MM-DD'))
);
```

```
INSERT
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (548430, 'Ghost Ship Games', 24675031984263507, 34.99, 'Deep Rock Galactic',
TO_DATE('2020-05-13', 'YYYY-MM-DD'))
);
```

```
INSERT
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (281990, 'Paradox Development Studio', 30672011703269611, 43.99, 'Stellaris',
TO_DATE('2016-05-09', 'YYYY-MM-DD'))
);
```

```
INSERT
INTO Product (appID, developerName, publisherSteamID, price, title, releaseDate)
VALUES (492740, 'Paradox Development Studio', 30672011703269611, 7.79, 'Stellaris: Complete
Soundtrack', TO_DATE('2016-07-12', 'YYYY-MM-DD'))
);
```

### Soundtrack

appID	composer
409210	Scott Lloyd Shelly/Resonance Array
1228810	Todd Masten and Semitone Media Group
1275570	Arnaud Roy
802640	Sophus Alf Agerbaek-Larsen
492740	Andreas Waldetoft

```
INSERT
INTO Soundtrack (appID, composer)
VALUES (409210, 'Scott Lloyd Shelly/Resonance Array')
);
```

```
INSERT
INTO Soundtrack (appID, composer)
VALUES (1228810, 'Todd Masten and Semitone Media Group')
);
```

```
INSERT
```

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```
INTO Soundtrack (appID, composer)
VALUES (1275570, 'Arnaud Roy')
);
```

```
INSERT
INTO Soundtrack (appID, composer)
VALUES (802640, 'Sophus Alf Agerbaek-Larsen')
);
```

```
INSERT
INTO Soundtrack (appID, composer)
VALUES (492740, 'Andreas Waldetoft')
);
```

#### DLC Expands

appID	dlcID
113204	9281765
113204	1283090
113204	1283091
113204	1430610
281990	1140001

```
INSERT
INTO DLC_Expands (appID, dlcID)
VALUES (113204, 9281765)
);
```

```
INSERT
INTO DLC_Expands (appID, dlcID)
VALUES (113204, 1283090)
);
```

```
SINSERT
INTO DLC_Expands (appID, dlcID)
VALUES (113204, 1283091)
);
```

```
INSERT
INTO DLC_Expands (appID, dlcID)
VALUES (113204, 1430610)
);
```

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INSERT

INTO DLC\_Expands (appID, dlcID)

VALUES (281990, 1140001)

);

INSERT

INTO DLC\_Expands (appID, dlcID)

VALUES (113204, 1283090)

);

INSERT

INTO DLC\_Expands (appID, dlcID)

VALUES (113204, 1283091)

);

INSERT

INTO DLC\_Expands (appID, dlcID)

VALUES (113204, 1430610)

);

### **HardwareRequirements**

appID	osVersion	soundCard	graphics	processor	storage	memory
105600	Windows 7, 8/8.1, 10	NULL	256MB Video Memory, Capable of Shader Model 2.0+	Dual Core 3.0 GHz	200MB	4GB
409210	Windows 7, 8/8.1, 10	NULL	256MB Video Memory, Capable of Shader Model 2.0+	Dual Core 3.0 GHz	200MB	4GB
113200	Windows XP, Vista, 7	NULL	Direct X9.0c Compatible Card	5 GHz	50MB	2GB
113204	Windows 10 64 Bit	NULL	NVIDIA 970 / AMD Radeon 290	2.4 GHz Quad Core	3 GB	8GB
1091500	Windows 7 or 10	NULL	NVIDIA GeForce GTX 780 or AMD Radeon RX 470	Intel Core i5-3570K or AMD FX-8310	70 GB available space	8 GB RAM
281990	Windows® 7 SP1 64 Bit	Direct X 9.0c- compatible sound card	Nvidia® GeForce™ GTX 460 or AMD® ATI Radeon™ HD 5870 (1GB VRAM), or AMD® Radeon™ RX Vega 11 or Intel® HD Graphics 4600	Intel® iCore™ i3-530 or AMD® FX-6350	10 GB available space	4 GB RAM

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INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (105600, 'Windows 7, 8/8.1, 10', NULL, '256MB Video Memory, Capable of Shader Model 2.0+', 'Dual Core 3.0 GHz', '200MB', '4GB')

);

INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (409210, 'Windows 7, 8/8.1, 10', NULL, '256MB Video Memory, Capable of Shader Model 2.0+', 'Dual Core 3.0 GHz', '200MB', '4GB')

);

INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (113200, 'Windows XP, Vista, 7', NULL, 'Direct X9.0c Compatible Card', '2.5 GHz', '50MB', '1GB')

);

INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (113204, 'Windows XP, Vista, 7', NULL, 'Direct X9.0c Compatible Card', '5 GHz', '50MB', '2GB')

);

INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (1091500, 'Windows 7 or 10', NULL, 'NVIDIA GeForce GTX 780 or AMD Radeon RX 470', 'Intel Core i5-3570K or AMD FX-8310', '70 GB available space', '8 GB RAM')

);

INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (281990, 'Windows® 7 SP1 64 Bit', 'Direct X 9.0c- compatible sound card', 'Nvidia® GeForce™ GTX 460 or AMD® ATI Radeon™ HD 5870 (1GB VRAM), or AMD® Radeon™ RX Vega 11 or Intel® HD Graphics 4600', 'Intel® iCore™ i3-530 or AMD® FX-6350', '10 GB available space', '4 GB RAM')



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);

INSERT

INTO HardwareRequirements (appID, osVersion, soundCard, graphics, processor, storage, memory)

VALUES (113204, 'Windows 10 64 Bit', NULL, 'NVIDIA 970 / AMD Radeon 290', '2.4 GHz Quad Core', '3 GB', '8 GB')

);

### Tag

tagName
Sandbox
Roguelike
Co-op
FPS
Action
Multiplayer
Class-Based
Cyberpunk
Open World
RPG
Sci-fi
Space
Grand Strategy
Exploration
4X
Futuristic

INSERT

INTO Tag (tagName)

VALUES ('Sandbox')

);

INSERT

INTO Tag (tagName)

VALUES ('Roguelike')

);

INSERT

INTO Tag (tagName)

VALUES ('Co-op')

);

```
INSERT  
INTO Tag (tagName)  
VALUES ('FPS')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('Action')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('Class-Based')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('Multiplayer')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('Cyberpunk')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('Open World')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('RPG')  
);
```

```
INSERT  
INTO Tag (tagName)  
VALUES ('Sci-fi')  
);
```

```
INSERT  
INTO Tag (tagName)
```

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```
VALUES ('Grand Strategy')
```

```
);
```

```
INSERT
```

```
INTO Tag (tagName)
```

```
VALUES ('Exploration')
```

```
);
```

```
INSERT
```

```
INTO Tag (tagName)
```

```
VALUES ('4X')
```

```
);
```

```
INSERT
```

```
INTO Tag (tagName)
```

```
VALUES ('Futuristic')
```

```
);
```

### Describes

tagName	appId
Sandbox	105600
Roguelike	113200
Co-op	548430
FPS	548430
Action	548430
Multiplayer	548430
Class-Based	548430
Space	281990
Grand Strategy	281990
Sci-fi	281990
Exploration	281990
4X	281990
Cyberpunk	1091500
Open World	1091500
RPG	1091500
Sci-fi	1091500
Futuristic	1091500

```
INSERT
```

```
INTO Describes (tagName, appId)
```

```
VALUES ('Sandbox', 105600)
```

```
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Roguelike', 113200)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Space', 281990)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Grand Strategy', 281990)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Sci-fi', 281990)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Exploration', 281990)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('4X', 281990)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Cyberpunk', 1091500)
);
```

```
INSERT
INTO Describes (tagName, applID)
VALUES ('Open World', 1091500)
);
```

```
INSERT
INTO Describes (tagName, applID)
```

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```
VALUES ('RPG', 1091500)
```

```
);
```

```
INSERT
```

```
INTO Describes (tagName, applD)
```

```
VALUES ('Sci-fi', 1091500)
```

```
);
```

```
INSERT
```

```
INTO Describes (tagName, applD)
```

```
VALUES ('Futuristic', 1091500)
```

```
);
```

```
INSERT
```

```
INTO Describes (tagName, applD)
```

```
VALUES ('Co-op', 548430)
```

```
);
```

```
INSERT
```

```
INTO Describes (tagName, applD)
```

```
VALUES ('FPS', 548430)
```

```
);
```

```
INSERT
```

```
INTO Describes (tagName, applD)
```

```
VALUES ('Class-Based', 548430)
```

```
);
```

```
INSERT
```

```
INTO Describes (tagName, applD)
```

```
VALUES ('Action', 548430)
```

```
);
```

### **Developer**

devName	followers	website
Re-Logic	32172	<a href="http://re-logic.com">re-logic.com</a>
Edmund Mcmillen and Florian Himsl	34734	NULL
Ghost Ship Games	3819	<a href="http://www.ghostship.dk/">http://www.ghostship.dk/</a>
CD Projekt Red	315601	<a href="http://en.cdprojektred.com">en.cdprojektred.com</a>
Forgotten Empires, Tantalus Media, Wicked Witch	48327	<a href="#">NULL</a>
AMPLITUDE Studios	41058	<a href="http://games2gether.com">games2gether.com</a>

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Paradox Development Studio	62469	<a href="http://paradoxplaza.com">paradoxplaza.com</a>
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INSERT

INTO Developer (devName, followers, website)

VALUES ('Re-Logic', 32172, 're-logic.com')

);

INSERT

INTO Developer (devName, followers, website)

VALUES ('Edmund McMillen and Florian Himsl', 34734, NULL)

);

INSERT

INTO Developer (devName, followers, website)

VALUES ('Ghost Ship Games', 3819, 'http://www.ghostship.dk/')

);

INSERT

INTO Developer (devName, followers, website)

VALUES ('CD Projekt Red', 315601, 'en.cdprojektred.com')

);

INSERT

INTO Developer (devName, followers, website)

VALUES ('Forgotten Empires, Tantalus Media, Wicked Witch', 48327, NULL)

);

INSERT

INTO Developer (devName, followers, website)

VALUES ('AMPLITUDE Studios', 41058, 'games2gether.com')

);

INSERT

INTO Developer (devName, followers, website)

VALUES ('Paradox Development Studio', 62469, 'paradoxplaza.com')

);

### Purchases

appID	steamID	invoiceNumber
105600	80470692171337084	4197854681354871230
113200	80470692171337084	2318120815620851132

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548430	20222895264715893	2318120567815620851
548430	20112012201320140	1234567123456712345
548430	12345612345600525	1934297245921527950

INSERT

INTO Purchases (applID, steamID, invoiceNumber)

VALUES (105600, 80470692171337084, 4197854681354871230)

);

INSERT

INTO Purchases (applID, steamID, invoiceNumber)

VALUES (113200, 80470692171337084, 2318120815620851132)

);

INSERT

INTO Purchases (applID, steamID, invoiceNumber)

VALUES (548430, 20222895264715893, 2318120567815620851)

);

INSERT

INTO Purchases (applID, steamID, invoiceNumber)

VALUES (548430, 20112012201320140, 1234567123456712345)

);

INSERT

INTO Purchases (applID, steamID, invoiceNumber)

VALUES (548430, 12345612345600525, 1934297245921527950)

);

### Account

steamID	balance	password	email	username	registrationDate	country
18512157936190734	46.18	:DZenith1983!	business@re-logic.com	Re-Logic	2011-01-07	US
80470692171337084	22.23	Password123!	kitkathrina@email.com	kitkathrina	2013-07-20	CA
29149147156919113	3.50	1980Isaac(T_T)	edmund@edmundmiller.com	edmundmiller	2009-02-14	US
20112012201320140	102.40	CPSC304RIP	databaserock@yahoo.com	DBDBDB	2021-01-01	CA
20222895264715893	5.78	Ilikepancake10	pancakeki@gmail.com	Pancake	2008-06-04	ID
12345612345600525	30.54	fishandchips39	fishnco32@gmail.co	Fishyfishy	2007-01-02	JP

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			m			
23899509526857143	0	iheartalt	johnny.silverhand@gmail.com	Samurai	1994-05-01	PL
60485693251700274	0	nathere2890	nat.sulat@rocketmail.com	Snat	1999-09-30	US
59986018078832402	0	hiimamy!!123	amy.wong@yahoo.com	awong	2003-02-18	US
24675031984263507	0	smithsonian999	smith.arnaud@gmail.com	The-sims	2012-04-27	US
30672011703269611	0	ilovepuppy45	zhang.gabrielle@gmail.com	PuppyMaster	1999-07-07	SE

INSERT

```
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (18512157936190734, 46.18, 'DZenith1983!', 'business@re-logic.com', 'Re-Logic',
TO_DATE('2011-01-07', 'YYYY-MM-DD'), 'US',)
);
```

INSERT

```
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (80470692171337084, 22.23, 'Password123!', 'kitkathrina@email.com', 'kitkathrina',
TO_DATE('2013-07-20', 'YYYY-MM-DD'), 'CA',)
);
```

INSERT

```
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (29149147156919113, 3.50, '1980Isaac(T_T)', 'edmund@edmundm.com', 'edmundmcmillen',
TO_DATE('2019-02-14', 'YYYY-MM-DD'), 'US',)
);
```

INSERT

```
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (20112012201320140, 102.40, 'CPSC304RIP', 'databaserock@yahoo.com', 'DBDBDB',
TO_DATE('2021-01-01', 'YYYY-MM-DD'), 'CA',)
);
```

INSERT

```
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (20222895264715893, 5.78, 'Ilikepancake10', 'pancakeki@gmail.com', 'Pancake',
TO_DATE('2008-06-04', 'YYYY-MM-DD'), 'ID',)
);
```

INSERT



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---

```
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (12345612345600525, 30.54, 'fishandchips39', 'fishnco32@gmail.com', 'Fishyfishy',
TO_DATE('2007-01-02', 'YYYY-MM-DD'), 'JP',)
);
```

```
INSERT
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (23899509526857143, 0, 'iheartalt', 'johnny.silverhand@gmail.com', 'Samurai',
TO_DATE('1994-05-01', 'YYYY-MM-DD'), 'PL',)
);
```

```
INSERT
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (60485693251700274, 0, 'nathere2890', 'nat.sulat@rocketmail.com', 'Snat',
TO_DATE('1999-09-30', 'YYYY-MM-DD'), 'US',)
);
```

```
INSERT
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (59986018078832402, 0, 'hiimamy!!123', 'amy.wong@yahoo.com', 'awong',
TO_DATE('2003-02-18', 'YYYY-MM-DD'), 'US',)
);
```

```
INSERT
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (24675031984263507, 0, 'smithsonian999', 'smith.arnaud@gmail.com', 'The-sims',
TO_DATE('2012-04-27', 'YYYY-MM-DD'), 'US',)
);
```

```
INSERT
INTO Account (steamID, balance, password, email, username, registrationDate, country)
VALUES (30672011703269611, 0, 'ilovepuppy45', 'zhang.gabrielle@gmail.com', 'PuppyMaster',
TO_DATE('1999-07-07', 'YYYY-MM-DD'), 'SE',)
);
```

### Locale

country	currency
US	USD
CA	CAD
ID	IDR
JP	YEN

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SE	SWE
PL	PLN

```
INSERT  
INTO Locale (country, currency)  
VALUES ('US', 'USD')  
);
```

```
INSERT  
INTO Locale (country, currency)  
VALUES ('CA', 'CAD')  
);
```

```
INSERT  
INTO Locale (country, currency)  
VALUES ('ID', 'IDR')  
);
```

```
INSERT  
INTO Locale (country, currency)  
VALUES ('JP', 'YEN')  
);
```

```
INSERT  
INTO Locale (country, currency)  
VALUES ('SE', 'SWE')  
);
```

```
INSERT  
INTO Locale (country, currency)  
VALUES ('PL', 'PLN')  
);
```

### Review

reviewID	appID	steamID	recommended	reviewDate	reviewDescription
1029384716	409210	80470692171337084	1	2020-06-29	Best \$2 I've ever spent.
9058293571	113200	80470692171337084	1	2016-03-07	A great game with endless replayability!
1594826730	548430	20222895264715893	1	2020-06-29	FUN FUN FUN. It is a dwarf in space, you cannot go wrong with that!
1594826732	548430	20112012201320140	1	2020-07-15	Fun solo and with friends. I have no clue how I never came across this

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					game earlier, because I would've definitely been playing this if I found it last year when I was bored of everything else I had.
1594826733	548430	12345612345600525	0	2020-07-20	Very linear, gets boring pretty fast

INSERT

```
INTO Review (reviewID, appID, steamID, recommended?, reviewDate, reviewDescription)
VALUES (1029384716, 409210, 80470692171337084, '1', TO_DATE('2020-06-29',
'YYYY-MM-DD'), 'Best $2 I've ever spent.')
);
```

INSERT

```
INTO Review (reviewID, appID, steamID, recommended?, reviewDate, reviewDescription)
VALUES (9058293571, 113200, 80470692171337084, '1', TO_DATE('2016-03-07',
'YYYY-MM-DD'), 'A great game with endless replayability!')
);
```

INSERT

```
INTO Review (reviewID, appID, steamID, recommended?, reviewDate, reviewDescription)
VALUES (1594826730, 548430, 20222895264715893, '1', TO_DATE('2020-06-29',
'YYYY-MM-DD'), 'FUN FUN FUN. It is a dwarf in space, you cannot go wrong with that!')
);
```

INSERT

```
INTO Review (reviewID, appID, steamID, recommended?, reviewDate, reviewDescription)
VALUES (1594826732, 548430, 20112012201320140, '1', TO_DATE('2020-07-15',
'YYYY-MM-DD'), 'Fun solo and with friends. I have no clue how I never came across this game
earlier, because I would've definitely been playing this if I found it last year when I was bored of
everything else I had.')
);
```

INSERT

```
INTO Review (reviewID, appID, steamID, recommended?, reviewDate, reviewDescription)
VALUES (1594826733, 548430, 12345612345600525, '0', TO_DATE('2020-07-20',
'YYYY-MM-DD'), 'Very linear, gets boring pretty fast')
);
```

### Invoice

invoiceNumber	appID	steamID	total	invoiceDate	paymentMethod
4197854681354871230	105600	80470692171337084	1.99	2014-09-04 23:58:51	Steam Wallet
2318120815620851132	113200	80470692171337084	0.87	2014-12-20 20:16:47	Steam Wallet

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2318120567815620851	548430	20222895264715893	34.99	2020-07-04 19:16:50	Steam Wallet
1234567123456712345	548430	20112012201320140	34.99	2020-09-15 20:20:20	Steam Wallet
1934297245921527950	548430	12345612345600525	34.99	2020-07-25 10:40:24	Steam Wallet

INSERT

```
INTO Invoice (invoiceNumber, appID, steamID, total, invoiceDate, paymentMethod)
VALUES (4197854681354871230, 105600, 80470692171337084, 1.99, TO_DATE('2014-09-04
23:58:51', 'YYYY-MM-DD HH24:MI:SS'), 'Steam Wallet')
);
```

INSERT

```
INTO Invoice (invoiceNumber, appID, steamID, total, invoiceDate, paymentMethod)
VALUES (2318120815620851132, 113200, 80470692171337084, 0.87, TO_DATE('2014-12-20
20:16:47', 'YYYY-MM-DD HH24:MI:SS'), 'Steam Wallet')
);
```

INSERT

```
INTO Invoice (invoiceNumber, appID, steamID, total, invoiceDate, paymentMethod)
VALUES (1234567123456712345, 548430, 20222895264715893, 34.99, TO_DATE('2020-07-04
19:16:50', 'YYYY-MM-DD HH24:MI:SS'), 'Steam Wallet')
);
```

INSERT

```
INTO Invoice (invoiceNumber, appID, steamID, total, invoiceDate, paymentMethod)
VALUES (1934297245921527950, 548430, 20112012201320140, 34.99, TO_DATE('2020-09-15
20:20:20', 'YYYY-MM-DD HH24:MI:SS'), 'Steam Wallet')
);
```

INSERT

```
INTO Invoice (invoiceNumber, appID, steamID, total, invoiceDate, paymentMethod)
VALUES (2318120567815620851, 548430, 12345612345600525, 34.99, TO_DATE('2020-07-25
10:40:24', 'YYYY-MM-DD HH24:MI:SS'), 'Steam Wallet')
);
```

### Publisher

steamID	routingNumber	firstName	lastName	bankAccountNumber
18512157936190734	071921891	Andrew	Spinks	9610273645
29149147156919113	121143736	Edmund	McMillen	2958105763
23899509526857143	196054388	Johnny	Silverhand	5521621685
60485693251700274	113080630	Sulat	Nat	2534957024
59986018078832402	317659925	Amy	Wong	7834422833

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24675031984263507	673046490	Arnaud	Smith	0605908624
30672011703269611	503732895	Gabrielle	Zhang	0223723265

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (18512157936190734, 071921891, 'Andrew', 'Spinks', 9610273645)
);
```

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (29149147156919113, 121143736, 'Edmund', 'McMillen', 2958105763)
);
```

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (23899509526857143, 196054388, 'Johnny', 'Silverhand', 5521621685)
);
```

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (60485693251700274, 113080630, 'Sulat', 'Nat', 2534957024)
);
```

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (59986018078832402, 317659925, 'Amy', 'Wong', 7834422833)
);
```

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (24675031984263507, 673046490, 'Arnaud', 'Smith', 0605908624)
);
```

INSERT

```
INTO Publisher (steamID, routingNumber, firstName, lastName, bankAccountNumber)
VALUES (30672011703269611, 503732895, 'Gabrielle', 'Zhang', 0223723265)
);
```

### **BankInfo**

routingNumber	bankAddress
071921891	3267 IN-32, Westfield, IN 46074, United States
121143736	75 River St, Santa Cruz, CA 95060, United States

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651241450	5905 Berton Ave, Vancouver, BC V6S 0B3, Canada
196054388	rondo ONZ 1, 00-124 Warszawa, Poland
113080630	401 W 42nd St, New York, NY 10036, United States
317659925	At&T Center, 227 W Monroe St, Chicago, IL 60606, United States
673046490	5000 Sunset Blvd, Los Angeles, CA 90027, United States
503732895	2257 Irving St, San Francisco, CA 94122, United States

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (071921891, '3267 IN-32, Westfield, IN 46074, United States')

);

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (121143736, '75 River St, Santa Cruz, CA 95060, United States')

);

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (651241450, '5905 Berton Ave, Vancouver, BC V6S 0B3, Canada')

);

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (196054388, 'rondo ONZ 1, 00-124 Warszawa, Poland')

);

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (113080630, '401 W 42nd St, New York, NY 10036, United States')

);

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (317659925, 'At&T Center, 227 W Monroe St, Chicago, IL 60606, United States')

);

INSERT

INTO BankInfo (routingNumber, bankAddress)

VALUES (673046490, '5000 Sunset Blvd, Los Angeles, CA 90027, United States')

);

INSERT

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---

```
INTO BankInfo (routingNumber, bankAddress)
VALUES (503732895, '2257 Irving St, San Francisco, CA 94122, United States')
);
```

#### Player

steamID	alias
80470692171337084	kitkathrina
29149147156919113	edmundmcchicken
20112012201320140	Raccoonmeat
20222895264715893	BOBOBOBS
12345612345600525	Plebeian

```
INSERT
INTO Player (steamID, alias)
VALUES (80470692171337084, kitkathrina)
);
```

```
INSERT
INTO Player (steamID, alias)
VALUES (29149147156919113, edmundmcchicken)
);
```

```
INSERT
INTO Player (steamID, alias)
VALUES (20112012201320140, Raccoonmeat)
);
```

```
INSERT
INTO Player (steamID, alias)
VALUES (20222895264715893, BOBOBOBS)
);
```

```
INSERT
INTO Player (steamID, alias)
VALUES (12345612345600525, Plebeian)
);
```

#### Plays

appId	steamID	hours
105600	80470692171337084	445.1

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113200	80470692171337084	178.3
548430	20112012201320140	300.5
548430	20222895264715893	62.4
548430	12345612345600525	3.4

```
INSERT  
INTO Plays (appID, steamID, hours)  
VALUES (105600, 80470692171337084, 445.1)  
);
```

```
INSERT  
INTO Plays (appID, steamID, hours)  
VALUES (113200, 80470692171337084, 178.3)  
);
```

```
INSERT  
INTO Plays (appID, steamID, hours)  
VALUES (548430, 20112012201320140, 300.5)  
);
```

```
INSERT  
INTO Plays (appID, steamID, hours)  
VALUES (548430, 20222895264715893, 62.4)  
);
```

```
INSERT  
INTO Plays (appID, steamID, hours)  
VALUES (548430, 12345612345600525, 10.2)  
);
```

**FriendsWith**

steamID	friendsID
80470692171337084	20112012201320140
20222895264715893	20112012201320140
80470692171337084	12345612345600525
12345612345600525	20112012201320140
12345612345600525	20222895264715893

```
INSERT  
INTO FriendsWith (steamID, friendsID)  
VALUES (80470692171337084, 20112012201320140)  
);
```



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---

```
INSERT
INTO FriendsWith (steamID, friendsID)
VALUES (20222895264715893, 20112012201320140)
);
```

```
INSERT
INTO FriendsWith (steamID, friendsID)
VALUES (80470692171337084, 12345612345600525)
);
```

```
INSERT
INTO FriendsWith (steamID, friendsID)
VALUES (12345612345600525, 20112012201320140)
);
```

```
INSERT
INTO FriendsWith (steamID, friendsID)
VALUES (12345612345600525, 20222895264715893)
);
```

### Achievement

achievementID	appID	steamID	percentOfPlayersEarned	description	name
1039582740	105600	80470692171337084	12.25	Complete your 50th quest for the angler.	Fast and Fishious
8302857194	113200	80470692171337084	6.7	Kill Satan with Samson	Blood Rights
4567981232	548430	20112012201320140	2.3	Complete an elite deep dive	Elite Diver
4567981233	548430	20112012201320140	20.4	Complete 25 Milestones	Management Approve
4567981232	548430	20222895264715893	2.3	Complete an elite deep dive	Elite Diver

```
INSERT
INTO Achievement (AchievementID, appID, steamID, percentOfPlayersEarned, description,
name)
VALUES (1039582740, 105600, 80470692171337084, 12.25, 'Complete your 50th quest for the
angler.', 'Fast and Fishious')
);
```

```
INSERT
INTO Achievement (AchievementID, appID, steamID, percentOfPlayersEarned, description,
name)
VALUES (8302857194, 113200, 80470692171337084, 6.7, 'Kill Satan with Samson', 'Blood
Rights')
);
```

```
INSERT
INTO Achievement (AchievementID, appID, steamID, percentOfPlayersEarned, description,
name)
VALUES (4567981232, 548430, 20112012201320140, 2.3, 'Complete an elite deep dive', 'Elite
Diver')
);
```

```
INSERT
INTO Achievement (AchievementID, appID, steamID, percentOfPlayersEarned, description,
name)
VALUES (4567981233, 548430, 20112012201320140, 20.4, 'Complete 25 Milestones',
'Management Approve')
);
```

```
INSERT
INTO Achievement (AchievementID, appID, steamID, percentOfPlayersEarned, description,
name)
VALUES (4567981232, 548430, 20222895264715893, 2.3, 'Complete an elite deep dive', 'Elite
Diver')
);
```

## QUESTION 8

**Insertion:** Add a new game into the product list

**Deletion:** Delete a player from the account list

**Update:** Update the description attribute in the review list

**Selection:** Select a tuple from player that has the most hours in a specific game

**Projection:** Project all the email addresses from the account list

**Join:** Find accounts who own a particular product by joining the Product and Account table with Purchase table

**Division:** Find which players have earned all the achievements of a game