**Business Rule**

1. A user has 0 or more than one characters.
2. It is possible for user to not have a character.
3. Characters can have 0 or more than one log history.
4. Character has only a level.
5. Level has 0 or more than one character
6. Level record documents of date with levels whenever character play the game.
7. Inventory can record date with items whenever items in inventory change.
8. Character has only an inventory
9. Inventory have only a character.
10. Inventory can have 0 or more than one log history
11. Item can have 0 or more than one inventory
12. It is possible for inventory to not have only item
13. A character can have 0 or more than one item.
14. (It is possible for item to stack up same items) I didn’t express this.

**User\_T**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| table\_catalog | table\_schema | table\_name | column\_name | ordinal\_position | is\_nullable | data\_type |
| GameStatistics | public | user\_t | user\_id | 1 | NO | character |
| GameStatistics | public | user\_t | user\_name | 2 | NO | character varying |
| GameStatistics | public | user\_t | user\_password | 3 | NO | character varying |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| character\_maximum\_length | character\_octet\_length | udt\_catalog | udt\_schema | udt\_name | dtd\_identifier |
| 6 | 24 | GameStatistics | pg\_catalog | bpchar | 1 |
| 64 | 256 | GameStatistics | pg\_catalog | varchar | 2 |
| 64 | 256 | GameStatistics | pg\_catalog | varchar | 3 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| is\_self\_referencing | is\_identity | is\_generated | is\_updatable | Description |
| NO | NO | NEVER | YES | User Number (User / Nationality / Num) |
| NO | NO | NEVER | YES | User Name |
| NO | NO | NEVER | YES | Password of User Name |

**Character\_T**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| table\_catalog | table\_schema | table\_name | column\_name | ordinal\_position | is\_nullable | data\_type |
| GameStatistics | public | character\_t | char\_id | 1 | NO | character |
| GameStatistics | public | character\_t | char\_name | 2 | NO | character varying |
| GameStatistics | public | character\_t | char\_job | 3 | NO | character |
| GameStatistics | public | character\_t | char\_gender | 4 | NO | boolean |
| GameStatistics | public | character\_t | user\_id | 5 | NO | character |
| GameStatistics | public | character\_t | level\_id | 6 | NO | character |
| GameStatistics | public | character\_t | inven\_id | 7 | NO | character |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| character\_maximum\_length | character\_octet\_length | udt\_catalog | udt\_schema | udt\_name | dtd\_identifier | is\_self\_referencing |
| 8 | 32 | GameStatistics | pg\_catalog | bpchar | 1 | NO |
| 64 | 256 | GameStatistics | pg\_catalog | varchar | 2 | NO |
| 3 | 12 | GameStatistics | pg\_catalog | bpchar | 3 | NO |
|  |  | GameStatistics | pg\_catalog | bool | 4 | NO |
| 6 | 24 | GameStatistics | pg\_catalog | bpchar | 5 | NO |
| 6 | 24 | GameStatistics | pg\_catalog | bpchar | 6 | NO |
| 8 | 32 | GameStatistics | pg\_catalog | bpchar | 7 | NO |

|  |  |  |  |
| --- | --- | --- | --- |
| is\_identity | is\_generated | is\_updatable | Description |
| NO | NEVER | YES | Character Number (Initial / Nationality / Number) |
| NO | NEVER | YES | Character Name |
| NO | NEVER | YES | Character code of job |
| NO | NEVER | YES | True(female) / False(male) |
| NO | NEVER | YES | User Number (User / Nationality / Num) |
| NO | NEVER | YES | Level Number (Initial / Nationality / Number) |
| NO | NEVER | YES | Inventory Number (IN000000) |

**Inventory\_T**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| table\_catalog | table\_schema | table\_name | column\_name | ordinal\_position | is\_nullable | data\_type |
| GameStatistics | public | inventory\_t | inven\_id | 1 | NO | character |
| GameStatistics | public | inventory\_t | item\_id | 2 | NO | character |
| GameStatistics | public | inventory\_t | inven\_money | 3 | NO | integer |
| GameStatistics | public | inventory\_t | inven\_size | 4 | YES | character |
| GameStatistics | public | inventory\_t | inven\_transactions | 5 | NO | boolean |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| character\_maximum\_length | character\_octet\_length | numeric\_precision | numeric\_precision\_radix | numeric\_scale | udt\_catalog |
| 8 | 32 |  |  |  | GameStatistics |
| 6 | 32 |  |  |  | GameStatistics |
|  |  | 32 | 2 | 0 | GameStatistics |
| 2 | 8 |  |  |  | GameStatistics |
|  |  |  |  |  | GameStatistics |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| udt\_schema | udt\_name | dtd\_identifier | is\_self\_referencing | is\_identity | is\_generated | is\_updatable | Description |
| pg\_catalog | bpchar | 1 | NO | NO | NEVER | YES | Inventory Number (IN000000) |
| pg\_catalog | bpchar | 2 | NO | NO | NEVER | YES | Item Number  (Initial / 5 char) |
| pg\_catalog | int4 | 3 | NO | NO | NEVER | YES | money belong to inventory |
| pg\_catalog | bpchar | 4 | NO | NO | NEVER | YES | item stack to inventory (max:20) |
| pg\_catalog | bool | 5 | NO | NO | NEVER | YES | True / False |

**Item\_T**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| table\_catalog | table\_schema | table\_name | column\_name | ordinal\_position | is\_nullable | data\_type |
| GameStatistics | public | item\_t | item\_id | 1 | NO | character |
| GameStatistics | public | item\_t | item\_name | 2 | NO | character varying |
| GameStatistics | public | item\_t | item\_disassemble | 3 | NO | boolean |
| GameStatistics | public | item\_t | item\_description | 4 | YES | character varying |
| GameStatistics | public | item\_t | item\_standprice | 5 | YES | character varying |
| GameStatistics | public | item\_t | item\_size | 6 | YES | character |
| GameStatistics | public | item\_t | item\_code | 7 | NO | character varying |
| GameStatistics | public | item\_t | item\_part | 8 | YES | character varying |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| character\_maximum\_length | character\_octet\_length | udt\_catalog | udt\_schema | udt\_name | dtd\_identifier | is\_self\_referencing |
| 6 | 24 | GameStatistics | pg\_catalog | bpchar | 1 | NO |
| 64 | 256 | GameStatistics | pg\_catalog | varchar | 2 | NO |
|  |  | GameStatistics | pg\_catalog | bool | 3 | NO |
| 255 | 1020 | GameStatistics | pg\_catalog | varchar | 4 | NO |
| 8 | 32 | GameStatistics | pg\_catalog | varchar | 5 | NO |
| 1 | 4 | GameStatistics | pg\_catalog | bpchar | 6 | NO |
| 10 | 40 | GameStatistics | pg\_catalog | varchar | 7 | NO |
| 10 | 40 | GameStatistics | pg\_catalog | varchar | 8 | NO |

|  |  |  |  |
| --- | --- | --- | --- |
| is\_identity | is\_generated | is\_updatable | Description |
| NO | NEVER | YES | Item Number (I00000) |
| NO | NEVER | YES | Item Name |
| NO | NEVER | YES | Is it possible to be disaseemble? |
| NO | NEVER | YES | description about item |
| NO | NEVER | YES | basic value of item |
| NO | NEVER | YES | potion can be 1 size. Weapon or armor can be 2~3 size. |
| NO | NEVER | YES | Item code (potion / weapon / armor) |
| NO | NEVER | YES | in weapon or armor, it should be hand / chest / leg |

**Level\_T**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| table\_catalog | table\_schema | table\_name | column\_name | ordinal\_position | is\_nullable | data\_type |
| GameStatistics | public | level\_t | level\_id | 1 | NO | character |
| GameStatistics | public | level\_t | level\_value | 2 | NO | character |
| GameStatistics | public | level\_t | level\_datestart | 3 | YES | timestamp without time zone |
| GameStatistics | public | level\_t | level\_dateend | 4 | YES | timestamp without time zone |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| character\_maximum\_length | character\_octet\_length | datetime\_precision | udt\_catalog | udt\_schema | udt\_name |
| 6 | 24 |  | GameStatistics | pg\_catalog | bpchar |
| 4 | 20 |  | GameStatistics | pg\_catalog | bpchar |
|  |  | 6 | GameStatistics | pg\_catalog | timestamp |
|  |  | 6 | GameStatistics | pg\_catalog | timestamp |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| dtd\_identifier | is\_self\_referencing | is\_identity | is\_generated | is\_updatable | Description |
| 1 | NO | NO | NEVER | YES | Level Number (Initial / Nationlity / Number) |
| 2 | NO | NO | NEVER | YES | Level Values of Character |
| 3 | NO | NO | NEVER | YES | Whenever player(especially, character) start to play the game, it counts |
| 4 | NO | NO | NEVER | YES | Whenever player finish to play the game, it counts |

**Login History\_T**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| table\_catalog | table\_schema | table\_name | column\_name | ordinal\_position | column\_default | is\_nullable |
| GameStatistics | public | loghistory\_t | log\_id | 1 |  | NO |
| GameStatistics | public | loghistory\_t | char\_id | 2 |  | NO |
| GameStatistics | public | loghistory\_t | inven\_id | 3 |  | NO |
| GameStatistics | public | loghistory\_t | log\_intime | 4 |  | YES |
| GameStatistics | public | loghistory\_t | log\_outtime | 5 |  | YES |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| data\_type | character\_maximum\_length | character\_octet\_length | datetime\_precision | udt\_catalog | udt\_schema | udt\_name |
| character | 8 | 32 |  | GameStatistics | pg\_catalog | bpchar |
| character | 8 | 32 |  | GameStatistics | pg\_catalog | bpchar |
| character | 8 | 32 |  | GameStatistics | pg\_catalog | bpchar |
| timestamp without time zone | | | 6 | GameStatistics | pg\_catalog | timestamp |
| timestamp without time zone | | | 6 | GameStatistics | pg\_catalog | timestamp |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| dtd\_identifier | is\_self\_referencing | is\_identity | is\_generated | generation\_expression | is\_updatable | Description |
| 1 | NO | NO | NEVER |  | YES | Log history nuymber (two Initials / numbers) |
| 2 | NO | NO | NEVER |  | YES | to match character information, add chracter id from chracter table |
| 3 | NO | NO | NEVER |  | YES | to match inventory information, add the column from inventory |
| 4 | NO | NO | NEVER |  | YES | whenever player login as user(not character), it counts |
| 5 | NO | NO | NEVER |  | YES | whenever player logout as user(not character), it counts |

**DROP TABLE STATEMENT**

DROP TABLE IF EXISTS User\_T CASCADE;

DROP TABLE IF EXISTS Level\_T CASCADE;

DROP TABLE IF EXISTS Item\_T CASCADE;

DROP TABLE IF EXISTS Inventory\_T CASCADE;

DROP TABLE IF EXISTS Character\_T CASCADE;

DROP TABLE IF EXISTS LoginHistory\_T CASCADE;

**CREATE TABLE STATEMENT**

CREATE TABLE User\_T (

User\_ID CHAR( 6 ),

User\_Name VARCHAR( 64 ) NOT NULL,

User\_Password VARCHAR( 64 ) NOT NULL,

CONSTRAINT PK\_User PRIMARY KEY( User\_ID )

);

CREATE TABLE Level\_T (

Level\_ID CHAR( 6 ),

Level\_Value CHAR( 4 ) NOT NULL,

Level\_DateStart TIMESTAMP,

Level\_DateEnd TIMESTAMP,

CONSTRAINT PK\_Level PRIMARY KEY( Level\_ID )

);

CREATE TABLE Item\_T (

Item\_ID CHAR( 6 ),

Item\_Name VARCHAR( 64 ) NOT NULL,

Item\_Disassemble BOOLEAN NOT NULL,

Item\_Description VARCHAR( 255 ),

Item\_StandPrice VARCHAR( 8 ),

Item\_Size CHAR( 1 ),

Item\_Code VARCHAR( 10 ) NOT NULL, -- can be weapon / amor / potion etc

Item\_Part VARCHAR( 10 ) NULL, -- can be Shoulder, hand, leg

CONSTRAINT PK\_Item PRIMARY KEY( Item\_ID )

);

CREATE TABLE Inventory\_T (

Inven\_ID CHAR( 8 ),

Item\_ID CHAR( 6 ) NOT NULL,

Inven\_Money INTEGER NOT NULL,

Inven\_Size CHAR( 2 ),

Inven\_Transactions BOOLEAN NOT NULL,

CONSTRAINT PK\_Inventory PRIMARY KEY( Inven\_ID ),

CONSTRAINT FK\_Inventory FOREIGN KEY( Item\_ID ) REFERENCES Item\_T( Item\_ID )

);

CREATE TABLE Character\_T (

Char\_ID CHAR( 8 ),

Char\_Name VARCHAR ( 64 ) NOT NULL,

Char\_Job CHAR( 3 ) NOT NULL,

Char\_Gender BOOLEAN NOT NULL,

User\_ID CHAR( 6 ) NOT NULL,

Level\_ID CHAR( 6 ) NOT NULL,

Inven\_ID CHAR( 8 ) NOT NULL,

CONSTRAINT PK\_Character PRIMARY KEY( Char\_ID ),

CONSTRAINT FK1\_Character FOREIGN KEY( User\_ID ) REFERENCES User\_T( User\_ID ),

CONSTRAINT FK2\_Character FOREIGN KEY( Level\_ID ) REFERENCES Level\_T( Level\_ID ),

CONSTRAINT FK3\_Character FOREIGN KEY( Inven\_ID ) REFERENCES Inventory\_T( Inven\_ID )

);

CREATE TABLE LogHistory\_T (

Log\_ID CHAR( 8 ),

Char\_ID CHAR( 8 ) NOT NULL,

Inven\_ID CHAR( 8 ) NOT NULL,

Log\_InTime TIMESTAMP,

Log\_OutTime TIMESTAMP,

CONSTRAINT PK1\_LogHistory PRIMARY KEY( Log\_ID ),

CONSTRAINT FK1\_LoginHistory FOREIGN KEY( Char\_ID ) REFERENCES Character\_T( Char\_ID ),

CONSTRAINT FK2\_LoginHistory FOREIGN KEY( Inven\_ID ) REFERENCES Inventory\_T( Inven\_ID )

);

**-- INDEX One for Level**

DROP INDEX IF EXISTS Level\_IDX;

CREATE INDEX Level\_IDX ON Level\_T (Level\_ID, Level\_Value);

**-- INDEX Two for Character**

DROP INDEX IF EXISTS Character\_IDX;

CREATE INDEX Character\_IDX ON Character\_T (Char\_ID, Char\_Gender);

**-- First VIEW; to figure out how much do users have money**

DROP VIEW IF EXISTS UserMoney\_V;

CREATE VIEW UserMoney\_V AS

SELECT Inventory\_T.Inven\_Money, Character\_T.Char\_Name

FROM Inventory\_T JOIN Character\_T

ON Character\_T.Inven\_ID = Inventory\_T.Inven\_ID

WHERE Inven\_Money <= (SELECT MAX(Inven\_Money) FROM Inventory\_T)

ORDER BY Inven\_Money DESC;

**-- Second VIEW; to figure out total money in game**

DROP VIEW IF EXISTS TotalMoney\_V;

CREATE VIEW TotalMoney\_V AS

SELECT SUM(Inven\_Money) AS SumMoney

FROM Inventory\_T

**DELETE STATEMENT**

DELETE FROM LogHistory\_T;

DELETE FROM Character\_T;

DELETE FROM Inventory\_T;

DELETE FROM Item\_T;

DELETE FROM User\_T;

DELETE FROM Level\_T;

**INSERT STATEMENT**

INSERT INTO User\_T VALUES ('UK0000', 'flower001', 'PassWorD@001');

INSERT INTO User\_T VALUES ('UK0001', 'weapon123', 'PassWorD@123');

INSERT INTO User\_T VALUES ('UK0002', 'armors456', 'PassWorD@45678');

INSERT INTO User\_T VALUES ('UK0003', 'prime01', 'PassWorD@4561010');

INSERT INTO User\_T VALUES ('UK0004', 'seongyeopjeong012345', 'PassWorD@456222334123');

INSERT INTO Level\_T VALUES ('LK0000', '101', '2011-02-15 15:00:00', '2011-02-18 17:00:00');

INSERT INTO Level\_T VALUES ('LK0001', '43', '2011-02-15 15:00:00', '2011-02-15 17:00:00');

INSERT INTO Level\_T VALUES ('LK0002', '12', '2011-02-15 15:00:00', '2011-02-15 20:13:57');

INSERT INTO Level\_T VALUES ('LK0003', '33', '2011-02-15 15:00:00', '2011-02-15 19:34:31');

INSERT INTO Level\_T VALUES ('LK0004', '170', '2011-02-15 15:00:00', '2011-02-15 16:50:11');

INSERT INTO Item\_T VALUES ('I00001', 'Healing Potion', 'FALSE', 'Red potion for healing user', '10', '1', 'portion', 'NULL');

INSERT INTO Item\_T VALUES ('I00002', 'Mana Potion', 'FALSE', 'Blue potion for fill up mana of user', '15', '1', 'potion', 'NULL');

INSERT INTO Item\_T VALUES ('I00003', 'Red wolf Katana Sword', 'TRUE', 'red potion for healing user', '100', '3', 'weapon', 'HAND');

INSERT INTO Item\_T VALUES ('I00004', 'Blood Lance', 'TRUE', 'This lance looks creepy due to the color of blood', '150', '3', 'weapon', 'HAND');

INSERT INTO Item\_T VALUES ('I00005', 'Armor for beginner', 'FALSE', 'It is armor for beginner', '0', '4', 'armor', 'BODY');

INSERT INTO Inventory\_T VALUES ('IN000000', 'I00001', '2500', '20', 'TRUE' ); -- '2011-02-16 13:00:00'

INSERT INTO Inventory\_T VALUES ('IN000001', 'I00001', '12500', '20', 'TRUE'); -- '2011-02-15 16:00:00'

INSERT INTO Inventory\_T VALUES ('IN000002', 'I00002', '455500', '20', 'FALSE'); -- '2011-02-16 12:00:00'

INSERT INTO Inventory\_T VALUES ('IN000003', 'I00002', '35200', '20', 'TRUE'); -- '2011-02-15 17:00:00'

INSERT INTO Inventory\_T VALUES ('IN000004', 'I00003', '224100', '20', 'FALSE'); -- '2011-02-15 16:00:00'

INSERT INTO Inventory\_T VALUES ('IN000005', 'I00004', '1344', '20', 'FALSE'); -- '2011-02-15 16:00:00'

INSERT INTO Inventory\_T VALUES ('IN000006', 'I00004', '167430', '20', 'FALSE'); -- '2011-02-15 16:00:00'

INSERT INTO Inventory\_T VALUES ('IN000007', 'I00005', '241563', '20', 'FALSE'); -- '2011-02-15 16:00:00'

INSERT INTO Inventory\_T VALUES ('IN000008', 'I00003', '21123', '20', 'FALSE'); -- '2011-02-15 16:00:00'

INSERT INTO Character\_T VALUES ('CK000000', 'Cseongyeop001', 'WAR', 'FALSE', 'UK0000', 'LK0000', 'IN000000');

INSERT INTO Character\_T VALUES ('CK000001', 'Cseongyeop002', 'KNI', 'TRUE', 'UK0001', 'LK0001', 'IN000001');

INSERT INTO Character\_T VALUES ('CK000002', 'Cjinsu001', 'MAG', 'FALSE', 'UK0002', 'LK0002', 'IN000002');

INSERT INTO Character\_T VALUES ('CK000003', 'Csamsung001', 'WAR', 'FALSE', 'UK0003', 'LK0003', 'IN000003');

INSERT INTO Character\_T VALUES ('CK000004', 'Clg001', 'ARC', 'TRUE', 'UK0004', 'LK0004', 'IN000004');

INSERT INTO LogHistory\_T VALUES ('LH000001', 'CK000000', 'IN000000', '2011-02-15 15:00:00', '2011-02-19 17:00:00');

INSERT INTO LogHistory\_T VALUES ('LH000002', 'CK000001', 'IN000001', '2011-02-15 15:00:00', '2011-02-15 17:50:11');

INSERT INTO LogHistory\_T VALUES ('LH000003', 'CK000002', 'IN000002', '2011-02-15 15:00:00', '2011-02-16 16:50:17');

INSERT INTO LogHistory\_T VALUES ('LH000004', 'CK000003', 'IN000003', '2011-02-15 15:00:00', '2011-02-15 19:50:13');

INSERT INTO LogHistory\_T VALUES ('LH000005', 'CK000004', 'IN000004', '2011-02-15 15:00:00', '2011-02-15 17:00:00');

**-- Simple statement Using SELECT and WHERE; What gender do users prefer to play as warrior?**

SELECT

Char\_Gender,

Char\_Job

FROM

Character\_T

WHERE

Character\_T.Char\_Job LIKE 'WAR'

**-- Simple statement Using SELECT and WHERE; Time of activity with each level of user**

SELECT

Level\_Value,

Level\_DateStart,

Level\_DateEnd,

(Level\_DateEnd - Level\_DateStart) AS TotalTime

FROM

Level\_T

WHERE

Level\_T.Level\_DateEnd BETWEEN '2011-02-15 18:00:00' AND '2011-02-15 23:59:59'

**-- Simple statement Using SELECT and WHERE; How many items can it be disasemble?**

SELECT

Item\_Name, Item\_Disassemble

FROM

Item\_T

WHERE

Item\_Disassemble = true;

**-- SUB QUERY 1: LEFT**

SELECT

Character\_T.Char\_Name, Inventory\_T.Inven\_Money

FROM

Character\_T LEFT OUTER JOIN Inventory\_T

ON

Character\_T.Inven\_ID = Inventory\_T.Inven\_ID

WHERE Inventory\_T.Inven\_Money BETWEEN 10000 AND 120000

**-- SUB QUERY 2 RIGHT JOINS;** What kind of items do users have? with level.

SELECT

Character\_T.Char\_Name, Item\_T.Item\_Name

FROM

Character\_T

RIGHT OUTER JOIN Inventory\_T

ON

Character\_T.Inven\_ID = Inventory\_T.Inven\_ID

RIGHT OUTER JOIN Item\_T

ON

Inventory\_T.Item\_ID = Item\_T.Item\_ID WHERE Char\_Name IS NOT NULL

**-- UNION STATEMENT**

SELECT User\_ID, User\_Name

FROM User\_T

UNION

SELECT Char\_ID, Char\_Name

FROM Character\_T;