University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 2

Date: July 18th, 2022

Group Number: 44

Name	Student Number	CS Alias (Userid)	Preferred E-mail Address
Chenwen Shen	13454772	m3d2b	imvanwendy@gmail.com
Sally Park	41475948	j8f0x	sallypark73@hotmail.com
Jasmine Mann	61798278	s3b2a	jasminem1449@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

ERD:
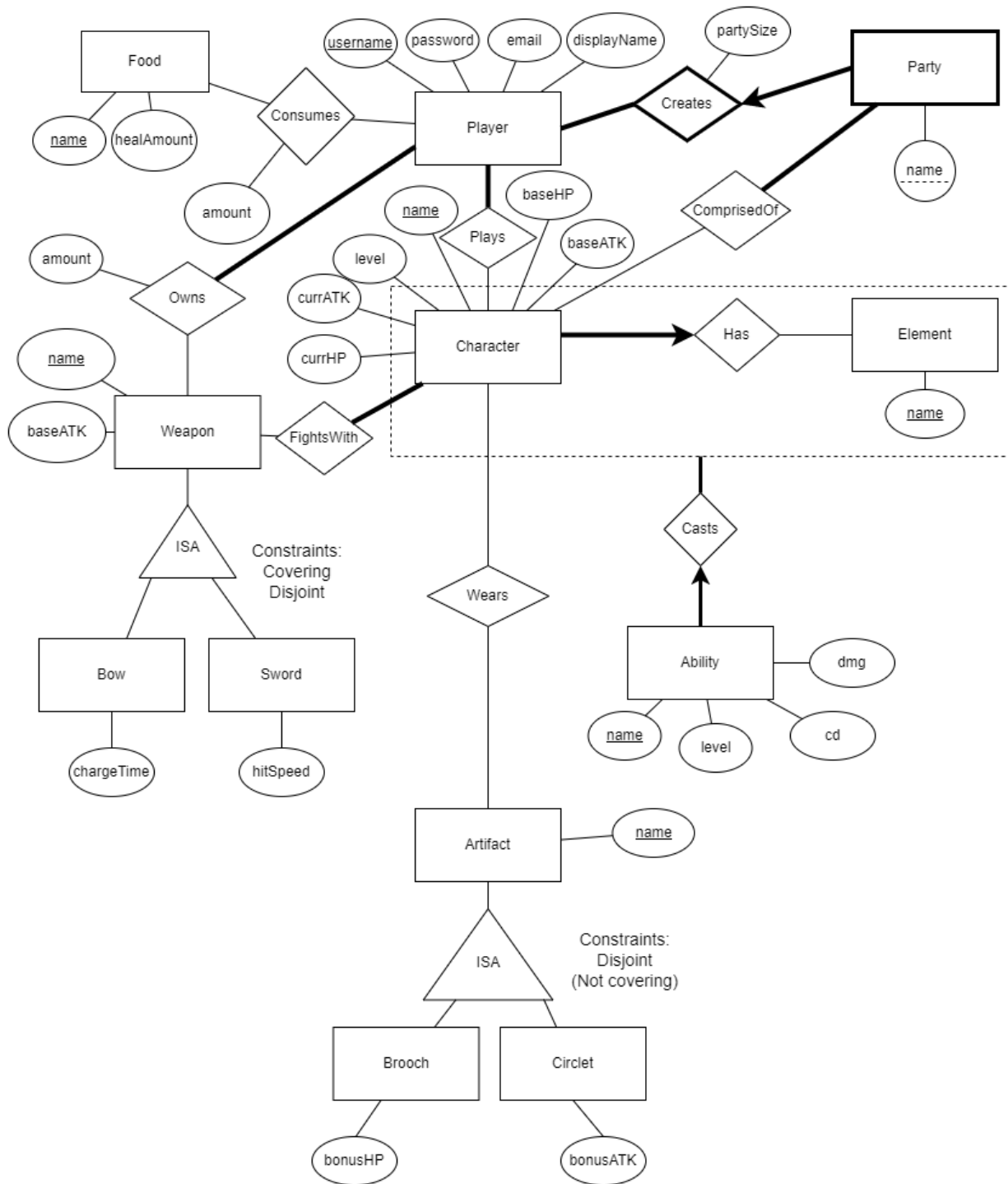
Changes to ERD:
- Party is now a Weak Entity of Player
- Ability is now an aggregation between Character and Element
  - thought these made more sense conceptually
- Changed a couple of relationship names
  - for clarity purposes
- Added/Deleted/Modified some attributes
  - add/delete to make FDs for normalization
  - changed names for clarity purposes
- Changed a few key constraints
  - fix some conceptual mistakes

Schema:

Player(<u>username</u>, password, email, displayName) (email unique - key) (all fields not null)
OwnsWeapon(**<u>username</u>**, **<u>wname,</u>** amount) (assertion needed for participation constraint)
Plays(**<u>username, cname</u>**) (assertion needed for participation constraint)
Consumes(**<u>username</u>**, **<u>fname</u>**, amount)
Food(<u>name</u>, healAmount)
PartyCreation(**<u>username</u>**,<u>pname,</u> partySize)
ComprisedOf(**<u>username</u>**, **<u>pname</u>**, **<u>cname</u>**) (assertion needed for participation constraint)
Character(<u>name</u>, level, baseHP, baseATK, currHP, currATK, **ename**) (ename cannot be null)
FightsWith(**<u>cname</u>**, **<u>wname</u>**) (assertion needed for participation constraint)
Wears(**<u>cname</u>**, **<u>aname</u>**)
AbilityCast(<u>aname</u>, **cname,** level, cd, dmg) (cname cannot be null, cname unique - key)
Element(<u>name</u>)
Weapon(<u>name</u>, baseATK)
Sword(**<u>wname,</u>** hitSpeed)
Bow(**<u>wname,</u>** chargeTime)
Artifact(<u>name</u>)
Brooch(**<u>aname,</u>** bonusATK)
Circlet(**<u>aname,</u>** bonusHP)

Functional Dependencies:

Player(<u>username</u>, password, email, displayName)
U -> E, P, D
E -> U, P, D (email is a key)
OwnsWeapon(**<u>username</u>**, **<u>wname,</u>** amount)
U,W -> A
Plays(**<u>username, cname)</u>**
Consumes(**<u>username</u>**, **<u>fname</u>**, amount)
U, F -> A
Food(<u>name</u>, healAmount)

N -> H
PartyCreation(**username**, pname, partySize)
ComprisedOf(**pname**, **cname**)
P, C -> N
Character(name, level, baseHP, baseATK, currHP, currATK, **ename**) (2NF)
N -> L, BHP, BATK, CHP, CATK, E
L, BHP -> CHP
L, BATK -> CATK
FightsWith(**cname**, **wname**)
Wears(**cname**, **aname**)
AbilityCast(aname, **cname,** level, cd, dmg) (2NF)
A -> C, L, CD, DMG
C -> A, L, CD, DMG (cname is a key)
L -> DMG
Element(name)
Sword(**wname,** hitSpeed)
W -> HS
Bow(**wname,** chargeTime)
W -> CT
Artifact(name)
Brooch(**aname,** bonusATK)
A -> ATK
Circlet(**aname,** bonusHP)
A -> HP

Normalization:

Player(username, password, email, displayName)
OwnsWeapon(**username**, **wname,** amount)
Plays(**username, cname**)
Consumes(**username**, **fname**, amount)
Food(name, healAmount)
PartyCreation(**username,**pname, partySize)
ComprisedOf(**username**, **pname**, **cname**)
Character(name, level, baseHP, baseATK, currHP, currATK, **ename**)

      Work:
      L, BHP -> CHP:
      CharacterHP(**L, BHP**, CHP)
      Character(N, L, BHP, BATK, CATK, **E**)
      L, BATK -> CATK:
      CharacterATK(**L, BATK**, CATK)
      Character(N, L, BHP, BATK, **E**)

Decomposition:
Character(<u>N</u>, L, BHP, BATK, **E**)
CharacterHP(**<u>L</u>**, **<u>BHP</u>**, CHP)
CharacterATK(**<u>L</u>**, **<u>BATK</u>**, CATK)

FightsWith(**<u>cname</u>**, **<u>wname</u>**) (assertion needed for participation constraint)
Wears(**<u>cname</u>**, **<u>aname</u>**)
AbilityCast(<u>aname</u>, **cname,** level, cd, dmg) (cname cannot be null, cname unique)

L -> DMG
AbilityDMG(**<u>L</u>**, DMG)
AbilityCast(<u>A,</u> **C**, L, CD)

Element(<u>name</u>)
Weapon(<u>name</u>, baseATK)
Sword(**<u>wname</u>,** hitSpeed)
Bow(**<u>wname</u>,** chargeTime)
Artifact(<u>name</u>)
Brooch(**<u>aname,</u>** bonusATK)
Circlet(**<u>aname,</u>** bonusHP)

SQL DDL:

```
CREATE TABLE Player(
    username    char(60)    PRIMARY KEY,
    password    char(80)    NOT NULL,
    email       char(80)    NOT NULL,
    displayName char(80)    NOT NULL,
    UNIQUE (email)
);

CREATE TABLE OwnsWeapon(
    username    char(80),
    wname       char(80),
    amount      int,
    PRIMARY KEY(username, wname),
    FOREIGN KEY(username) REFERENCES Player
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(wname) REFERENCES Weapon
    ON DELETE CASCADE
    ON UPDATE CASCADE
```

```sql
);

CREATE TABLE Plays(
    username    char(80),
    cname       char(80),
    PRIMARY KEY(username, cname),
    FOREIGN KEY(username) REFERENCES Player
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(cname) REFERENCES CharacterHas
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Consumes(
    username    char(80),
    fname       char(80),
    amount      int,
    PRIMARY KEY(username, cname),
    FOREIGN KEY(username) REFERENCES Player
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(fname) REFERENCES Food
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Food(
    name        char(80)    PRIMARY KEY,
    healAmount  int     DEFAULT 0
);

CREATE TABLE PartyCreation(
    username    char(80),
    pname       char(80),
    partySize   int,
    PRIMARY KEY(username, pname),
    FOREIGN KEY(username) REFERENCES Player
    ON DELETE CASCADE
    ON UPDATE CASCADE
);
```

```sql
CREATE TABLE ComprisedOf(
    username    char(80),
    pname       char(80),
    cname       char(80),
    PRIMARY KEY(username, pname, cname),
    FOREIGN KEY(username) REFERENCES Player
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(pname) REFERENCES PartyCreation
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(cname) REFERENCES CharacterHas
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE CharacterHas(
    name        char(80)    PRIMARY KEY,
    level       int,
    baseHP      int,
    baseATK     int,
    ename       char(80)    NOT NULL,
    FOREIGN KEY(ename) REFERENCES Element
    ON UPDATE CASCADE
);

CREATE TABLE CharacterHP(
    level       int,
    baseHP      int,
    currHP      int,
    PRIMARY KEY (level, baseHP),
    FOREIGN KEY (level) REFERENCES CharacterHas (level) ON DELETE CASCADE ON UPDATE
CASCADE,
    FOREIGN KEY (baseHP) REFERENCES CharacterHas (baseHP) ON DELETE CASCADE ON UPDATE
CASCADE,
);

CREATE TABLE CharacterATK(
    level       int,
    baseATK     int,
    currATK     int,
    PRIMARY KEY (level, baseATK),
```

```sql
    FOREIGN KEY(level) REFERENCES CharacterHas (level) ON DELETE CASCADE ON UPDATE
CASCADE,
    FOREIGN KEY (baseATK) REFERENCES CharacterHas (baseATK)ON DELETE CASCADE ON UPDATE
CASCADE

);

CREATE TABLE FightsWith(
    cname        char(80),
    wname        char(80),
    PRIMARY KEY(cname, wname),
    FOREIGN KEY(cname) REFERENCES CharacterHas
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(wname) REFERENCES Weapon
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Wears(
    cname        char(80),
    aname        char(80),
    PRIMARY KEY(cname, aname),
    FOREIGN KEY(cname) REFERENCES CharacterHas
    ON DELETE CASCADE
    ON UPDATE CASCADE,
    FOREIGN KEY(aname) REFERENCES Artifact
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

-- Ability
CREATE TABLE AbilityCast(
  aname        char(80)    PRIMARY KEY,
  cname        char(80)    NOT NULL,
  level        int,
  cd           float,
  dmg          int,
  FOREIGN KEY(cname) REFERENCES CharacterHas
   ON DELETE CASCADE
   ON UPDATE CASCADE,
);
```

```sql
CREATE TABLE AbilityDMG(
    level       int     PRIMARY KEY,
    dmg         int,
    FOREIGN KEY(level) REFERENCES AbilityCast
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Element(
    name        char(80)    PRIMARY KEY
);

CREATE TABLE Weapon(
    name    char(80)    PRIMARY KEY,
    baseATK     int
);

CREATE TABLE Sword(
    wname       char(80)    PRIMARY KEY,
    hitSpeed    int,
    FOREIGN KEY (wname) REFERENCES Weapon
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Bow(
    wname       char(80)    PRIMARY KEY,
    chargeTime  int,
    FOREIGN KEY (wname) REFERENCES Weapon
    ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Artifact(
    name        char(80)    PRIMARY KEY
);

CREATE TABLE Brooch(
    aname       char(80)    PRIMARY KEY,
    bonusHP     int,
    FOREIGN KEY(aname) REFERENCES Artifact
```

```sql
        ON DELETE CASCADE
    ON UPDATE CASCADE
);

CREATE TABLE Circlet(
    aname         char(80)    PRIMARY KEY,
    bonusATK      int,
    FOREIGN KEY(aname) REFERENCES Artifact
    ON DELETE CASCADE
    ON UPDATE CASCADE
);
```

```sql
/* Tuples in Player table */
INSERT
INTO    Player   (username, password, email, displayName)
VALUES  ('player1', 'password123', 'player1@gmail.com', 'Tiger123')

INSERT
INTO    Player   ('player2', 'donut456', 'donut@gmail.com',
'DonutLover')

INSERT
INTO    Player ('player3', 'animalgirl', 'ilikeanimals@gmail.com',
'AnAnimal')

INSERT
INTO    Player ('player4', 'BlueWhale', 'fish4lyfe@gmail.com',
'Bigbluewhale')

INSERT
INTO    Player ('player5', 'plants', 'cactus223@gmail.com',
'Cactusplayer')


/* Tuples in OwnsWeapon table */
INSERT
INTO    OwnsWeapon  (username, wname, amount)
VALUES  ('player2', 'Dull Blade', 2)

INSERT
INTO  OwnsWeapon    ('player2', 'Alley Hunter', 6)

INSERT
INTO  OwnsWeapon    ('player3', 'Alley Hunter', 3)

INSERT
INTO  OwnsWeapon    ('player4', 'Jade Cutter' , 1)

INSERT
INTO  OwnsWeapon    ('player5', 'Stringless', 2)


/* Tuples in Plays table */
INSERT
INTO    Plays   (username, cname)
VALUES  ('player1', 'Klee')
```

```
INSERT
INTO    Plays   ('player2', 'Qiqi')


INSERT
INTO    Plays   ('player3', 'Klee')


INSERT
INTO    Plays   ('player4', 'Xinyan')


INSERT
INTO    Plays   ('player5', 'Xiao')



/* Tuples in Consumes table */
INSERT
INTO    Consumes    (username, fname, amount)
VALUES  ('player1', 'Mushroom Pizza', 2)


INSERT
INTO    Consumes    ('player2', 'Jade Parcels', 5)


INSERT
INTO    Consumes    ('player2', 'Fullmoon Egg', 1)


INSERT
INTO    Consumes    ('player3', 'Teyvat Fried Egg', 1)


INSERT
INTO    Consumes    ('player4', 'Butter Crab', 3)


INSERT
INTO    Consumes    ('player5', 'Crystal Shrimp', 7)



/* Tuples in Food table */
INSERT
INTO    Food    (name, healAmount)
VALUES  ('Mushroom Pizza', 450)


INSERT
INTO    Food    ('Jade Parcels', 500)


INSERT
INTO    Food    ('Fullmoon Egg', 300)
```

```
INSERT
INTO     Food     ('Teyvat Fried Egg', 750)


INSERT
INTO     Food     ('Butter Crab', 150)


INSERT
INTO     Food     ('Crystal Shrimp', 900)


INSERT
INTO     Food     ('Five Pickled Treasures', 500)


INSERT
INTO     Food     ('Grilled Tiger Fish', 75)


INSERT
INTO     Food     ('Lotus Flower Crisp', 975)



/* Tuples in PartyCreation table */
INSERT
INTO     PartyCreation     (username, pname, partySize)
VALUES  ('player1', 'partyepic', 1)


INSERT
INTO     PartyCreation     ('player2', 'animalParty', 2)


INSERT
INTO     PartyCreation     ('player3', 'coolKidsonly', 1)


INSERT
INTO     PartyCreation     ('player4', 'genshinpartyppl', 3)


INSERT
INTO     PartyCreation     ('player5', 'lonerclub', 1)



/* Tuples in ComprisedOf table */
INSERT
INTO     ComprisedOf     (username, pname, cname)
VALUES  ('player1', 'partyepic', 'Klee')


INSERT
INTO     ComprisedOf     ('player2', 'animalParty', 'Qiqi')
```

```
INSERT
INTO    ComprisedOf     ('player2', 'animalParty', 'Klee')


INSERT
INTO    ComprisedOf     ('player3', 'coolKidsonly', 'Klee')


INSERT
INTO    ComprisedOf     ('player4', 'genshinpartyppl', 'Xinyan')


INSERT
INTO    ComprisedOf     ('player4', 'genshinpartyppl', 'Xiao')


INSERT
INTO    ComprisedOf     ('player4', 'genshinpartyppl', 'Qiqi')


INSERT
INTO    ComprisedOf     ('player5', 'lonerclub', 'Xiao')



/* Tuples in CharacterHas table */
INSERT
INTO    CharacterHas    (name, level, baseHP, baseATK, ename)
VALUES  ('Klee', 10, 801, 24, 'Pyro')


INSERT
INTO    CharacterHas    ('Qiqi', 12, 963, 22, 'Cryo')


INSERT
INTO    CharacterHas    ('Xinyan', 3, 939, 21, 'Pyro')


INSERT
INTO    CharacterHas    ('Xiao', 22, 991, 27, 'Anemo')


INSERT
INTO    CharacterHas    ('Mona', 17, 810, 22, 'Hydro')



/* Tuples in CharacterHP table */
INSERT
INTO    CharacterHP     (level, baseHP, currHP)
VALUES  (10, 801, 1021)


INSERT
INTO    CharacterHP     (12, 963, 1567)
```

```
INSERT
INTO    CharacterHP    (3, 939, 2001)

INSERT
INTO    CharacterHP    (22, 991, 1347)

INSERT
INTO    CharacterHP    (17, 810, 998)


/* Tuples in CharacterATK table */
INSERT
INTO    CharacterATK    (level, baseATK, currATK)
VALUES  (10, 24, 27)

INSERT
INTO    CharacterATK    (12, 22, 30)

INSERT
INTO    CharacterATK    (3, 21, 21)

INSERT
INTO    CharacterATK    (22, 27, 33)

INSERT
INTO    CharacterATK    (17, 22, 31)


/* Tuples in FightsWith table */
INSERT
INTO    FightsWith    (cname, wname)
VALUES  ('Klee', 'Jade Cutter')

INSERT
INTO    FightsWith    ('Qiqi', 'Dull Blade')

INSERT
INTO    FightsWith    ('Xinyan', 'Dull Blade')

INSERT
INTO    FightsWith    ('Xiao', 'Stringless')

INSERT
INTO    FightsWith    ('Mona', 'Alley Hunter')
```

```
/* Tuples in Wears table */
INSERT
INTO    Wears    (cname, aname)
VALUES  ('Klee', 'Silver Crown')

INSERT
INTO    Wears    ('Qiqi', 'Heart Pin')

INSERT
INTO    Wears    ('Xinyan', 'Turtle Talisman')

INSERT
INTO    Wears    ('Xiao', 'Pearl Necklace')

INSERT
INTO    Wears    ('Mona', 'Heart Pin')




/* Tuples in AbilityCast table */
INSERT
INTO    AbilityCast    (aname, cname, level, cd, dmg)
VALUES  ('Circlet', 'Klee', 10, 38.0, 89)

INSERT
INTO    AbilityCast    ('Preserver of Fortune', 'Qiqi', 12, 25.5,
105)

INSERT
INTO    AbilityCast    ('Riff Revolution', 'Xinyan', 3, 47.0, 54)

INSERT
INTO    AbilityCast    ('Bane of All Evil', 'Xiao', 22, 20.0, 201)

INSERT
INTO    AbilityCast    ('Fate', 'Mona' 17, 12.0, 133)




/* Tuples in AbilityDMG table */
INSERT
INTO    AbilityDMG    (level, dmg)
```

```
VALUES   (10, 89)

INSERT
INTO     AbilityDMG     (12, 105)

INSERT
INTO     AbilityDMG     (3, 54)

INSERT
INTO     AbilityDMG     (22, 201)

INSERT
INTO     AbilityDMG     (17, 133)


/* Tuples in Element table */
INSERT
INTO     Element     (name)
VALUES   ('Cryo')

INSERT
INTO     Element     ('Pyro')

INSERT
INTO     Element     ('Anemo')

INSERT
INTO     Element     ('Hydro')

INSERT
INTO     Element     ('Geo')

INSERT
INTO     Element     ('Electro')

INSERT
INTO     Element     ('Dendro')


/* Tuples in Weapon table */
INSERT
INTO     Weapon     (name, baseATK)
VALUES   ('Jade Cutter', 110)
```

```
INSERT
INTO    Weapon    ('Iron Sting', 109)

INSERT
INTO    Weapon    ('Dull Blade',  56)

INSERT INTO Weapon ("Skyward Blade", 122)

INSERT INTO Weapon ("Mistsplitter", 133)

INSERT INTO Weapon ('Alley Hunter', 65)

INSERT INTO Weapon ('Stringless', 62)

INSERT INTO Weapon ("Raven Bow", 46)

INSERT INTO Weapon ("Rust", 70)

INSERT INTO Weapon ("Skyward Harp", 125)



/* Tuples in Sword table */
INSERT
INTO    Sword    (wname, hitSpeed)
VALUES  ('Jade Cutter', 5)

INSERT
INTO    Sword    ('Dull Blade', 20)

INSERT
INTO    Sword    ('Iron Sting', 25)

INSERT INTO Sword ("Skyward Blade", 5)

INSERT INTO Sword ("Mistsplitter", 5)


/* Tuples in Bow table */
INSERT
INTO    Bow     (wname, chargeTime)
VALUES          ('Alley Hunter', 20)

INSERT
INTO    Bow     ('Stringless', 15)
```

```
INSERT INTO Bow ("Raven Bow", 10)

INSERT INTO Bow ("Rust", 5)

INSERT INTO Bow ("Skyward Harp", 10)



/* Tuples in Artifact table */
INSERT
INTO     Artifact     (name)
VALUES   ("Adventurer's Flower")

INSERT
INTO     Artifact     ('Pearl Necklace')

INSERT
INTO     Artifact     ('Turtle Talisman')

INSERT
INTO     Artifact     ('Silver Crown')

INSERT INTO Artifact ('Gold Crown')

INSERT INTO Artifact ("Copper Crown")

INSERT INTO Artifact ('Emerald Crown')

INSERT INTO Artifact ("Ruby Crown")

INSERT
INTO     Artifact     ('Heart Pin')

INSERT INTO Artifact ("Gold Pin")

INSERT INTO Artifact ("Ruby Pin")

INSERT INTO Artifact ("Emerald Pin")

INSERT INTO Artifact ("Copper Pin")



/* Tuples in Brooch table */
```

```
INSERT
INTO    Brooch    (aname, bonusHP)
VALUES  ('Heart Pin', 100)

INSERT INTO Brooch ("Gold Pin", 50)

INSERT INTO Brooch ("Ruby Pin", 120)

INSERT INTO Brooch ("Emerald Pin", 66)

INSERT INTO Brooch ("Copper Pin", 12)



/* Tuples in Circlet table */
INSERT
INTO    Circlet    (aname, bonusATK)
VALUES  ('Silver Crown', 5)

INSERT INTO Circlet ('Gold Crown', 10)

INSERT INTO Circlet ("Copper Crown", 2)

INSERT INTO Circlet ('Emerald Crown', 25)

INSERT INTO Circlet ('Ruby Crown', 50)
```