

# CPSC 304 Project Cover Page

Milestone #: 2

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Group Number: 39

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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 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.)

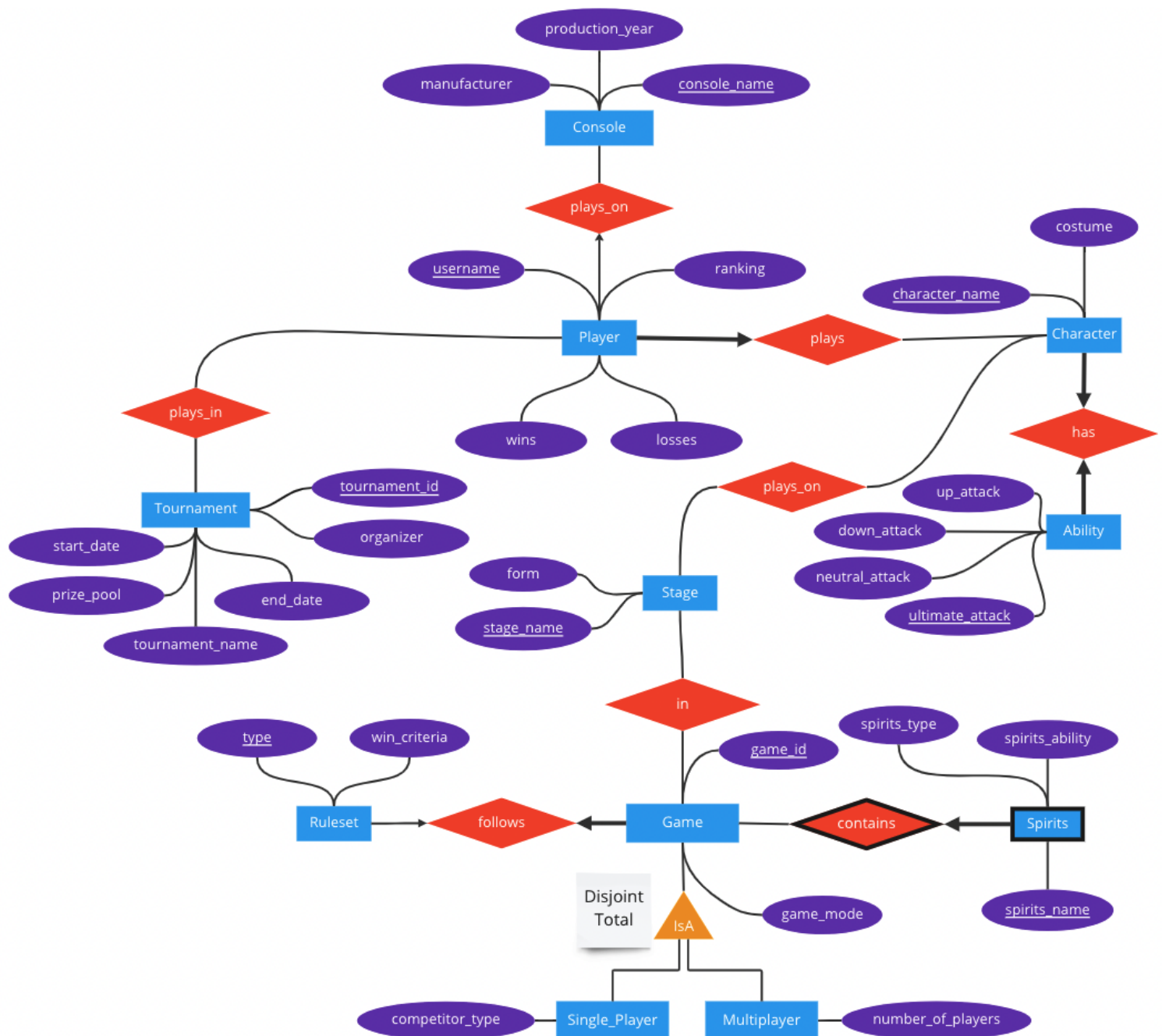
In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

## Project Summary

Our project depicts data from Nintendo's popular video game, Super Smash Bros. The project stores information about players (e.g., ranking, wins, losses) playing in a tournament, storing information on the character they play, the stages played on, and the game modes they use. Please note the project idea is different from what we have submitted in Milestone 1.

## ER Diagram

Please note the ER diagram submitted here differs from Milestone 1 as we switched project ideas based on our TA's feedback. Previously, we based our project on the concept of a food inventory and recipe tracker. However, based on our TA's feedback, we felt like the idea had a lot of uncertainties as many entities and relationships felt forced. Therefore, we switched concepts and we believe that our current Super Smash Bros idea is more appropriate for our project. We emailed our TA for some preliminary feedback on our ER Diagram and based on their feedback, we adjusted our weak entity and ensured the cardinalities used in the ER Diagram matched the assumptions we made, and adjusted the placements of a few entities.



## Schema

Please note: **foreign keys are bolded** and primary keys are underlined

Player (username: CHAR(20), ranking: INTEGER, wins: INTEGER, losses: INTEGER, **character\_name**: CHAR(20), **console\_name**: CHAR(20)), character\_name and console\_name NOT NULL

Plays\_On\_Console (console\_name: CHAR(20), manufacturer: CHAR(20), production\_year: INTEGER)

Plays\_In (username: CHAR(20), **tournament\_id**: CHAR(20)), username and tournament\_id NOT NULL

Tournament (tournament\_id: CHAR(20), tournament\_name: CHAR(20), organizer: CHAR(20), start\_date: DATE, end\_date: DATE, prize\_pool: INTEGER)

Character (character\_name: CHAR(20), costume: CHAR(20), **ultimate\_attack**: CHAR(20), **stage\_name**: CHAR(20), PRIMARY KEY(name)), ultimate\_attack UNIQUE, ultimate\_attack NOT NULL

Ability (ultimate\_attack: CHAR(20), up\_attack: CHAR(20), neutral\_attack: CHAR(20), down\_attack: CHAR(20), **character\_name**: CHAR(20)) character\_name UNIQUE, character\_name NOT NULL

Stage (stage\_name: CHAR(20), form: CHAR(20))

Stage\_In\_Game (**stage\_name**: CHAR(20), **game\_id**: CHAR(20)), stage\_name and game\_id NOT NULL

Game (game\_id: CHAR(20), game\_mode: CHAR(20), **type**: CHAR(20))

Contains\_Spirits (spirits\_name: CHAR(20), spirits\_ability: CHAR(20), spirits\_type: CHAR(20), **game\_id**: CHAR(20))

Single\_Player (game\_id: CHAR(20), competitor\_type: CHAR(20))

Multiplayer (game\_id: CHAR(20), number\_of\_players: INTEGER)

Ruleset (type: CHAR(20), win\_criteria: CHAR(20), **game\_id**: CHAR(20))

## Functional Dependencies (FDs)

### Plays

Wins, Losses  $\rightarrow$  Ranking

### Stage

Stage\_Name  $\rightarrow$  Form

Character\_Name  $\rightarrow$  Stage\_Name

### Console

Console\_name  $\rightarrow$  Manufacturer

### Ability

Neutral\_Attack, Up\_Attack, Down\_Attack  $\rightarrow$  Ultimate\_Attack

## Normalization

Plays\_On(Character\_Name, Costume, Stage\_Name, Form)

### Functional Dependencies

Stage\_Name  $\rightarrow$  Form

Character\_Name  $\rightarrow$  Stage\_Name

Plays\_On is not in BCNF, therefore we must decompose.

Enclosures:

- Stage\_Name<sup>+</sup> = {Stage\_Name, Form}
- Character\_Name<sup>+</sup> = {Character\_Name, Stage\_Name, Form}

Left	Middle	Right
Character_Name, Costume	Stage_Name	Form

Key:

- Character\_Name, Costume<sup>+</sup> = {Character\_Name, Costume, Stage\_Name, Form}

Decomposition:

1. Decompose: Stage\_Name  $\rightarrow$  Form
  - a. R1(Stage\_Name:CHAR(20), Form:CHAR(20))
  - b. R2(Stage\_Name:CHAR(20), Costume:CHAR(20), Character\_Name:CHAR(20))
2. Decompose: Character\_Name  $\rightarrow$  Stage\_Name

- a. R3(Character\_Name:CHAR(20), Stage\_Name:CHAR(20))
- b. R4(Character\_Name:CHAR(20), Costume:CHAR(20))

Final Answer:

- R1(Stage\_Name:CHAR(20), Form:CHAR(20))
- R3(Character\_Name:CHAR(20), Stage\_Name:CHAR(20))
- R4(Character\_Name:CHAR(20), Costume:CHAR(20))

Rest of the Tables:

Player (username: CHAR(20), ranking: INTEGER, wins: INTEGER, losses: INTEGER, **character\_name**: CHAR(20), **console\_name**: CHAR(20)), character\_name and console\_name NOT NULL

Plays\_On\_Console (console\_name: CHAR(20), manufacturer: CHAR(20), production\_year: INTEGER)

Plays\_In (username: CHAR(20), tournament\_id: CHAR(20)), username and tournament\_id NOT NULL

Tournament (tournament\_id: CHAR(20), tournament\_name: CHAR(20), organizer: CHAR(20), start\_date: DATE, end\_date: DATE, prize\_pool: INTEGER)

Character (character\_name: CHAR(20), costume: CHAR(20), **ultimate\_attack**: CHAR(20), **stage\_name**: CHAR(20), PRIMARY KEY(name)), ultimate\_attack UNIQUE, ultimate\_attack NOT NULL

Ability (ultimate\_attack: CHAR(20), up\_attack: CHAR(20), neutral\_attack: CHAR(20), down\_attack: CHAR(20), **character\_name**: CHAR(20)) character\_name UNIQUE, character\_name NOT NULL

Stage (stage\_name: CHAR(20), form: CHAR(20))

Stage\_In\_Game (stage\_name: CHAR(20), game\_id: CHAR(20)), stage\_name and game\_id NOT NULL

Game (game\_id: CHAR(20), game\_mode: CHAR(20), **type**: CHAR(20))

Contains\_Spirits (spirits\_name: CHAR(20), spirits\_ability: CHAR(20), spirits\_type: CHAR(20), **game\_id**: CHAR(20))

Single\_Player (game\_id: CHAR(20), competitor\_type: CHAR(20))

Multiplayer (game\_id: CHAR(20), number\_of\_players: INTEGER)

Ruleset (type: CHAR(20), win\_criteria: CHAR(20), **game\_id**: CHAR(20))

## The SQL DDL Statements

```
CREATE TABLE Player (  
    username CHAR(20),  
    ranking INTEGER,  
    wins INTEGER,  
    losses INTEGER,  
    character_name CHAR(20) NOT NULL,  
    console_name CHAR(20) NOT NULL,  
    PRIMARY KEY (username),  
    FOREIGN KEY (character_name) REFERENCES Character (character_name),  
        ON DELETE NO ACTION  
        ON UPDATE NO ACTION,  
    FOREIGN KEY (console_name) REFERENCES Plays_On_Console(console_name),  
        ON DELETE CASCADE  
        ON UPDATE CASCADE)
```

```
CREATE TABLE Plays_On_Console (  
    console_name CHAR(20),  
    manufacturer CHAR(20),  
    production_year INTEGER,  
    PRIMARY KEY (console_name))
```

```
CREATE TABLE Plays_In (  
    username CHAR(20) NOT NULL,  
    tournament_id CHAR(20) NOT NULL,  
    PRIMARY KEY (username, tournament_id),  
    FOREIGN KEY (username) REFERENCES Player (username),  
        ON DELETE CASCADE  
        ON UPDATE CASCADE,  
    FOREIGN KEY (tournament_id) REFERENCES Tournament (tournament_id),  
        ON DELETE CASCADE  
        ON UPDATE CASCADE)
```

```
CREATE TABLE Tournament (  
    tournament_id CHAR(20),  
    tournament_name CHAR(20),  
    organizer CHAR(20),  
    start_date DATE,  
    end_date DATE,  
    prize_pool INTEGER,
```

PRIMARY KEY (tournament\_id))

```
CREATE TABLE Character (  
    character_name CHAR(20),  
    costume CHAR(20),  
    ultimate_attack CHAR(20) UNIQUE NOT NULL,  
    stage_name CHAR(20),  
    PRIMARY KEY (name),  
    FOREIGN KEY (ultimate_attack) REFERENCES Ability (ultimate_attack),  
        ON DELETE NO ACTION  
        ON UPDATE NO ACTION,  
    FOREIGN KEY (stage_name) REFERENCES Stage (stage_name),  
        ON DELETE CASCADE  
        ON UPDATE CASCADE)
```

```
CREATE TABLE Ability (  
    ultimate_attack CHAR(20),  
    up_attack CHAR(20),  
    neutral_attack CHAR(20),  
    down_attack CHAR(20),  
    character_name CHAR(20) UNIQUE NOT NULL,  
    PRIMARY KEY (ultimate_attack),  
    FOREIGN KEY (character_name) REFERENCES Character (character_name),  
        ON DELETE NO ACTION  
        ON UPDATE NO ACTION)
```

```
CREATE TABLE Stage (  
    stage_name CHAR(20),  
    form CHAR(20),  
    PRIMARY KEY (stage_name))
```

```
CREATE TABLE Stage_In_Game (  
    stage_name CHAR(20) NOT NULL,  
    game_id CHAR(20) NOT NULL,  
    PRIMARY KEY (stage_name, game_id),  
    FOREIGN KEY (stage_name) REFERENCES Stage (stage_name),  
        ON DELETE CASCADE  
        ON UPDATE CASCADE,  
    FOREIGN KEY (game_id) REFERENCES Game (game_id),  
        ON DELETE CASCADE  
        ON UPDATE CASCADE)
```

```
CREATE TABLE Game (  
    game_id INTEGER,
```

```

game_mode CHAR(20),
type CHAR(20),
PRIMARY KEY(game_id),
FOREIGN KEY (type) REFERENCES Ruleset (type),
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)

```

```

CREATE TABLE Contains_Spirits (
    spirits_name CHAR(20),
    spirits_ability CHAR(20),
    spirits_type CHAR(20),
    game_id CHAR(20),
    PRIMARY KEY (spirits_name, game_id),
    FOREIGN KEY (game_id) REFERENCES Game (game_id),
        ON DELETE CASCADE
        ON UPDATE CASCADE)

```

```

CREATE TABLE Single_Player (
    game_id INTEGER,
    competitor_type CHAR(20),
    PRIMARY KEY(game_id))

```

```

CREATE TABLE Multiplayer (
    game_id INTEGER,,
    number_of_players INTEGER,
    PRIMARY KEY(game_id))

```

```

CREATE TABLE Ruleset (
    type CHAR(20),
    win_criteria CHAR(20),
    game_id CHAR(20),
    PRIMARY KEY(type),
    FOREIGN KEY(game_id) REFERENCES Game (game_id),
        ON DELETE CASCADE
        ON UPDATE CASCADE)

```

## **INSERT Statements**

```

INSERT INTO Player
VALUES ("Overtaker", 1, 509, 5)
("Anywehe", 2, 634, 12)
("Sally", 234, 23, 6)
("Adam", 6, 498, 6)
("Zahgrd", 3266, 5, 86)
("Victory", 10, 345, 9)

```



("Christian", 8, 236, 5)  
("Hauntzer", 88, 145, 46)

```
INSERT INTO Plays_On_Console
VALUES ("Xbox", "Microsoft Studios", 2010)
("Nintendo 3DS", "Nintendo", 2022)
("Nintendo Switch", "Nintendo", 2009)
("PS5", "Sony", 2011)
("PS4", "Sony", 2015)
("Wii", "Nintendo", 2008)
("GameCube", "Nintendo", 2006)
("PS3", "Sony", 2006)
```

```
INSERT INTO PlaysIn
VALUES ("Overtaker", "aaa")
("Anywehe", "bbb")
("Sally", "bbb")
("Adam", "ccc")
("Zahgrd", "aaa")
("Victory", "ddd")
("Christian", "eee")
("Hauntzer", "fff")
```

```
INSERT INTO Tournament
VALUES ("aaa", "THE SMASHERS", "Taryn Wou", "2021-01-04", "2021-01-05", "2000")
("bbb", "MEOWZERS", "Vanessa Lee", "2022-08-09", "2022-08-11", "30000")
("ccc", "Ultra Tournament", "Isaac Chung", "2022-08-09", "2022-08-11", "30000")
("ddd", "Sentinals", "Kitty Liu", "2022-08-09", "2022-08-11", "30000")
("eee", "100 Thieves", "Angelina Hsu", "2022-08-09", "2022-08-11", "30000")
("fff", "Vancouver Smash Tournament", "Ellen Yang", "2022-08-09", "2022-08-11",
"30000")
("ggg", "Canadian Nationals", "Andrea Yeo", "2022-08-09", "2022-08-11", "30000")
("hhh", "BC Provincials", "Annie Wang", "2022-06-16", "2022-06-18", "30000")
```

```
INSERT INTO Character
VALUES ("Bowser", "orange")
("Mario", "red")
("Peach", "pink")
("Yoshi", "green")
("Wario", "purple")
("Daisy", "yellow")
("Pikachu", "green")
("Kirby", "pink")
```

```
INSERT INTO Ability
```

VALUES ("Super Jump Punch", "F.L.U.D.D", "Fireball")  
("Peach Parasol", "Vegetable", "Toad")  
("Egg Throw", "Yoshi Bomb", "Egg Lay")  
("Corkscrew", "Wario Waft", "Chomp")  
("Daisy Parasol", "Vegetable", "Toad")  
("Quick Attack", "Thunder", "Thunder Jolt")  
("Final Cutter", "Stone", "Inhale")

INSERT INTO Stage  
VALUES ("Battlefield", "Battlefield")  
("Super Happy Tree", "Omega")  
("Spring Stadium", "Omega")  
("Windy Hill Zone", "Battlefield")  
("Mario Galaxy", "Normal")  
("Mushroom Kingdom I", "Normal")  
("Big Blue", "Battlefield")

INSERT INTO Stage\_In\_GameMode  
VALUES ("Battlefield", "Smash")  
("Super Happy Tree", "Squad Strike")  
("Spring Stadium", "Smash")  
("Windy Hill Zone", "Tournament")  
("Mario Galaxy", "Smash")  
("Mushroom Kingdom I", "Squad Strike")  
("Big Blue", "Squad Strike")

INSERT INTO Game  
VALUES (40, "Battlefield", "Digby", "Neutral", "Primary")  
(5, "Omega", "Seliph", "Attack", "Primary")  
(263, "Battlefield", "Mr. Sandman", "Attack", "Primary")  
(2634, "Normal", "Winky", "Attack", "Support")  
(234, "Normal", "Rocky", "Instadrop", "Support")  
(2345, "Normal", "Party Phil", "Shield", "Support")  
(12873, "Battlefield", "Wind Fish", "Attack", "Support")

INSERT INTO Single\_Player  
VALUES (4, "Smash", "CPU")  
(193, "Smash", "Player")  
(98, "Smash", "CPU")  
(1521, "Smash", "CPU")  
(7, "Squad Strike", "CPU")  
(31, "Squad Strike", "Player")  
(110, "Squad Strike", "CPU")  
(90, "Tournament", "CPU")

```
INSERT INTO Multiplayer
VALUES (390, "Tournament", 4)
(17, "Squad Strike", 6)
(123, "Smash", 5)
(982, "Tournament", 8)
(153, "Smash", 5)
(1230, "Squad Strike", 2)
(263, "Tournament", 7)
```