University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: __2_____

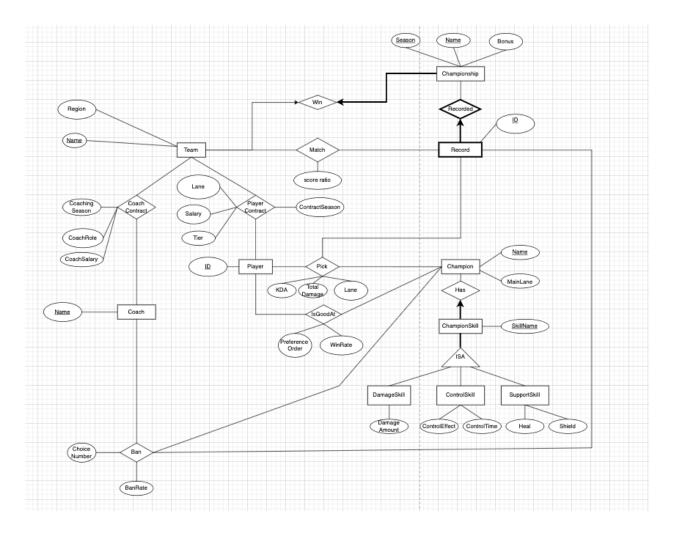Date: ___2022. Oct.21_____

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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

Milestone2

Updated ER Diagram and notes for update

Update note:

1. remove entity "region" and make it to be an attribute of Team

2. add more attributes to relation "coach contract"; "player contract"; "ban"; "pick" for normalization and keep more information

3. add more attributes to entities "Championship"; "record"

4. remove attribute "season" from team, "season" is now recorded within two contracts, and corresponding championship

5. change relation between team and match to many to many

Schema

Entities

Team(<u>Team_name</u>, region) (region can not be null)

Coach(<u>Coach_name</u>)

Player(<u>Player_id</u>)

Championship(<u>Championship_Season, championship_name</u>, **Team_name,** Bonus) (bonus must be unique)

Record(<u>Record_id</u>, **Championship_season, Championship_name**)

Champion(<u>Name</u>, main lane)

ChampionSkill(<u>skill name,</u> **Champion_name**)

DamageSkill(**<u>skill name</u>**, **Champion_name,** damage amount)

ControlSkill(**<u>skill name</u>**, **Champion_name,** control effect, control time)

SupportSkill(**<u>skill name</u>**, **Champion_name,** heal, shield)

Relations

Coach Contract(**Team_name, Coach_Name**, Coaching_season, role, coach_salary)

Player Contract(**Team_name, Player_ID**, Contract_season, Lane, tier, Contract_Fee) (tier can not be null)

Pick(**Player_ID, Champion_name, record_id**,**Championship_season, Championship_name,** KDA, total_damage, lane)

Ban(**Coach_name, Champion_name, record_id**,**Championship_season, Championship_name,** choice_number, ban_rate) (choice_number can not be null)

IsGoodAt(**Player_ID, Champion_name**, preference order, win_rate)

Match(**Team_name_win, Team_name_lose, record_id, Championship_name, championship_season**, score_ratio) (two teams must be different)

Functional Dependencies

Coach Contract:

Coaching _season, Coach_Name → Team_Name, role, coach_salary

Team_Name, Coaching_season, role → Coach_name, coach_salary

role → coach_salary

Player contract

Contract _Season, Player_ID → Team_Name, lane, salary, tier

tier → Contract_Fee

Contract_Fee → tier

Ban

Record_id, choice_number,Champion_name, record_id,Championship_season →
Champion_name, coach_name, ban_rate

Record_id, Champion_name → choice_number, ban_rate

Pick

Record_id, Player_id, Champion_name, record_id,Championship_season → Champion_name,
KDA, total_damage, lane

Record_id, lane→ Player_id, Champion_name, KDA, total_damage, lane

record_id, Champion_name → Player_id, KDA, total_damage, lane

IsGoodAt

Player_id, Preference Order → Champion_name, win_rate

Player_id, Champion_name→ Preference_order, win_rate

Match

record_id, Championship_name, championship_season →Team_name_win, Team_name_lose,
score_ratio

Normalization

Coach Contract:

$R_{CoachContract1} = \{TeamName, CoachName, CoachingSeason, Role, coachSalary\}$

Decompose with FD: role → coachSalary

$R_{CoachContract2} = \{TeamName, CoachName, CoachingSeason, Role, \}$

$R_{CoachContract3} = \{Role, CoachSalary\}$

Player contract:

$R_{PlayerContract1} = \{TeamName, PlayerID, ContractSeason, Lane, tier, ContractFee\}$

$R_{PlayerContract1} = \{TeamName, PlayerID, ContractSeason, Lane, tier, salary\}$

Decompose with FD: tier → coachSalary

$$R_{PlayerContract2} = \{TeamName, PlayerID, ContractSeason, Lane, tier\}$$
$$R_{PlayerContract1} = \{tier, ContractFee\}$$

Ban, Pick, Match and IsGoodAt do not need decomposition

SQL DDL and INSERT

```
CREATE TABLE Team (
    teamName char(10) PRIMARY KEY,
    region char(3)
);

CREATE TABLE Coach (
    coachName char(50) PRIMARY KEY
);

CREATE TABLE Player (
    playerID char(50) PRIMARY KEY
);

CREATE TABLE Championship(
    championshipSeason char(50),
    championshipName char(50),
    teamName char(10) DEFAULT 'UNKNOWN',
    bonus INT UNIQUE,
    PRIMARY KEY(championshipName, championshipSeason),
    FOREIGN KEY(teamName) REFERENCES Team(teamName) ON DELETE SET DEFAULT
);

CREATE TABLE Record(
    recordID int,
    championshipSeason char(50),
    championshipName char(50),
    PRIMARY KEY(recordID, championshipName, championshipSeason),
    FOREIGN KEY(championshipName) REFERENCES Championship(championshipName) ON DELETE CASC
ADE,
    FOREIGN KEY(championshipSeason) REFERENCES Championship(championshipSeason) ON DELETE
 CASCADE
);

CREATE TABLE Champion(
    championName char(20) PRIMARY KEY,
    mainLane char(20)
);

CREATE TABLE ChampionSkill(
```

```
    skillName char(50) PRIMARY KEY,
    championName char(20),
    FOREIGN KEY (championName) REFERENCES Champion(championName) ON DELETE CASCADE
);

CREATE TABLE DamageSkill(
    skillName char(50) PRIMARY KEY,
    championName char(20),
    damageAmount int,
    FOREIGN KEY(skillName) REFERENCES ChampionSkill(skillName) ON DELETE CASCADE,
    FOREIGN KEY (championName) REFERENCES ChampionSkill(championName) ON DELETE CASCADE
);

CREATE TABLE ControlSkill(
    skillName char(50) PRIMARY KEY,
    championName char(20),
    controlEffect char(50),
    controlTime float,
    FOREIGN KEY(skillName) REFERENCES ChampionSkill(skillName) ON DELETE CASCADE,
    FOREIGN KEY(championName) REFERENCES ChampionSkill(championName) ON DELETE CASCADE
);

CREATE TABLE SupportSkill(
    skillName char(50) PRIMARY KEY,
    championName char(20),
    heal int,
    shield INT,
    FOREIGN KEY(skillName) REFERENCES ChampionSkill(skillName) ON DELETE CASCADE,
    FOREIGN KEY(championName) REFERENCES ChampionSkill(championName) ON DELETE CASCADE
);

CREATE TABLE CoachContract1(
    teamName char(10),
    coachName char(50),
    coachingSeason char(20),
    coachRole char(50),
    PRIMARY KEY(teamName, coachName),
    FOREIGN KEY(teamName) REFERENCES Team(teamName) ON DELETE CASCADE,
    FOREIGN KEY(coachName) REFERENCES Coach(coachName) ON DELETE CASCADE
);

CREATE TABLE CoachContract2(
    coachRole char(50) PRIMARY KEY,
    coachSalary int,
    FOREIGN KEY(coachRole) REFERENCES CoachContract1(coachRole) ON DELETE CASCADE
);

CREATE TABLE PlayerContract1(
    playerID char(50),
    teamName char(10),
    contractSeason char(50),
    lane char(3),
    tier int,
    PRIMARY KEY(playerID, teamName),
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```
    FOREIGN KEY(playerID) REFERENCES Player(playerID) ON DELETE CASCADE,
    FOREIGN KEY(teamName) REFERENCES Team(teamName) ON DELETE CASCADE
)

CREATE TABLE PlayerContract2(
    tier int PRIMARY KEY,
    contractFee int,
    FOREIGN KEY(tier) REFERENCES PlayerContract1(tier) ON DELETE CASCADE
);

CREATE TABLE Pick (
    playerID char(50)DEFAULT 'UNKNOWN',
    championName char(20)DEFAULT 'UNKNOWN',
    recordID int,
    championshipSeason char(50),
    championshipName char(50),
    kda char(20),
    totalDamage int,
    lane char(3),
    PRIMARY KEY(playerID, championName, recordID, championshipSeason,championshipName),
    FOREIGN KEY(playerID) REFERENCES Player(playerID) ON DELETE SET DEFAULT,
    FOREIGN KEY(championName) REFERENCES Champion(championName) ON DELETE SET DEFAULT,
    FOREIGN KEY(championshipName) REFERENCES Record(championshipName) ON DELETE CASCADE,
    FOREIGN KEY(championshipSeason) REFERENCES Record(championshipSeason) ON DELETE CASCAD
E,
    FOREIGN KEY(recordID) REFERENCES Record(recordID) ON DELETE CASCADE
);

CREATE TABLE Ban(
    coachName char(50) DEFAULT 'UNKNOWN',
    championName char(20) DEFAULT 'UNKNOWN',
    recordID int,
    championshipSeason char(50),
    championshipName char(50),
    choiceNumber int,
    banRate float,
    PRIMARY KEY(coachName, championName,recordID,championshipSeason,championshipName),
    FOREIGN KEY(coachName) REFERENCES Coach(coachName) ON DELETE SET DEFAULT,
    FOREIGN KEY(championName) REFERENCES Champion(championName) ON DELETE SET DEFAULT,
    FOREIGN KEY(championshipName) REFERENCES Record(championshipName) ON DELETE CASCADE,
    FOREIGN KEY(championshipSeason) REFERENCES Record(championshipSeason) ON DELETE CASCAD
E,
    FOREIGN KEY(recordID) REFERENCES Record(recordID) ON DELETE CASCADE
);

CREATE TABLE IsGoodAt(
    playerID char(50),
    championName char(20) DEFAULT 'UNKNOWN',
    preferenceOrder int,
    winRate float,
    PRIMARY KEY(playerID,championName),
    FOREIGN KEY(playerID) REFERENCES Player(playerID) ON DELETE CASCADE,
    FOREIGN KEY(championName) REFERENCES Champion(championName) ON DELETE SET DEFAULT
);
```

```
CREATE TABLE Match(
    teamNameWin char(10),
    teamNameLose char(10),
    championshipName char(50),
    championshipSeason char(50),
    scoreRatio float,
    PRIMARY KEY(teamNameWin, teamNameLose, championshipName, championshipSeason),
    FOREIGN KEY(teamNameWin) REFERENCES Team(teamName) ON DELETE SET NULL,
    FOREIGN KEY(teamNameLose) REFERENCES Team(teamName) ON DELETE SET NULL,
    FOREIGN KEY(championshipName) REFERENCES Championship(championshipName) ON DELETE CASC
ADE,
    FOREIGN KEY(championshipSeason) REFERENCES Championship(championshipSeason) ON DELETE
 CASCADE
);


insert into Team values('RNG','LPL');
insert into Team values('GENG','LCK');
insert into Team values('CFO','PCS');
insert into Team values('100T','LCS');
insert into Team values('DRX','LCK');

insert into Coach values('KENZHU');
insert into Coach values('Dong-bin');
insert into Coach values('Achie');
insert into Coach values('Han-gyu');
insert into Coach values('Anaks');


insert into Player values('Breathe');
insert into Player values('Peanut');
insert into Player values('Mission');
insert into Player values('FBI');
insert into Player values('BeryL');

insert into Championship values('S12','World Championship','RNG',1);
insert into Championship values('S12','Mid-Season Invitational','RNG',2);
insert into Championship values('S11','World Championship','DRX',3);
insert into Championship values('S11','Mid-Season Invitational','DRX',4);
insert into Championship values('S11','LPL summer','RNG',5);

insert into Record values(1,'S12','World Championship');
insert into Record values(2,'S12','Mid-Season Invitational');
insert into Record values(3,'S11','World Championship');
insert into Record values(4,'S11','Mid-Season Invitational');
insert into Record values(5,'S11','LPL summer');

insert into Champion values('Aatrox','top');
insert into Champion values('Graves','jungle');
insert into Champion values('Victor','mid');
insert into Champion values('Miss Fortune','bot');
insert into Champion values('Blitzcrank','sup');
```

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insert into Champion values('Zed', 'mid');
insert into Champion values('Thresh', 'sup');
insert into Champion values('Nami', 'sup');
insert into Champion values('Janna', 'sup');

insert into ChampionSkill values('the darkin blade','Aatrox');
insert into ChampionSkill values('smoke screen','Graves');
insert into ChampionSkill values('death ray','Victor');
insert into ChampionSkill values('make it rain','Miss Fortune');
insert into ChampionSkill values('power fist','Blitzcrank');
insert into ChampionSkill values('Razor Shuriken','Zed');
insert into ChampionSkill values('Gravity field','Victor');
insert into ChampionSkill values('Mistral Bolt','Vex');
insert into ChampionSkill values('Looming Darkness','Vex');
insert into ChampionSkill values('Death Sentence','Thresh');
insert into ChampionSkill values('Dark passage','Thresh');
insert into ChampionSkill values('Tidecaller Blessing','Nami');
insert into ChampionSkill values('Ebb and Flow','Nami');
insert into ChampionSkill values('Eye Of The Storm','Janna');
insert into ChampionSkill values('Zephyr','Janna');

insert into DamageSkill values('the darkin blade','Aatrox',100);
insert into DamageSkill values('Razor Shuriken','Zed',200);
insert into DamageSkill values('Shadow Slash','Zed',111);
insert into DamageSkill values('Mistral Bolt','Vex',150);
insert into DamageSkill values('death ray','Victor',300);

insert into ControlSkill values('Gravity field','Victor','stun',1);
insert into ControlSkill values('Looming Darkness','Vex','fear',1);
insert into ControlSkill values('smoke screen','Graves','blind',1.5);
insert into ControlSkill values('power fist','Blitzcrank','scilence', 1);
insert into ControlSkill values('Death Sentence','Thresh','air bone', 0.5);

insert into SupportSkill values('Dark passage','Thresh',0, 100);
insert into SupportSkill values('Tidecaller Blessing','Nami',150,150);
insert into SupportSkill values('Ebb and Flow','Nami',100,0);
insert into SupportSkill values('Eye Of The Storm','Janna',0,200);
insert into SupportSkill values('Zephyr','Janna',500,0);

insert into CoachContract1 values('RNG','KENZHU','S12','head coach');
insert into CoachContract1 values('GENG','Dong-bin','S12','head coach');
insert into CoachContract1 values('CFO','Achie','S12','head coach');
insert into CoachContract1 values('100T','Han-gyu','S12','head coach');
insert into CoachContract1 values('DRX','Anaks','S12','head coach');

insert into CoachContract2 values('head coach',1000000);
insert into CoachContract2 values('assistant coach',200000);
insert into CoachContract2 values('leader',500000);
insert into CoachContract2 values('manager',1200000);
insert into CoachContract2 values('analyst',600000);

insert into PlayerContract1 values('Breathe','RNG','S12','top',1);
insert into PlayerContract1 values('Peanut','GENG','S12','jungle',1);
insert into PlayerContract1 values('Mission','CFO','S12','mid',3);
```

```
insert into PlayerContract1 values('FBI','100T','S12','bot',2);
insert into PlayerContract1 values('BeryL','DRX','S12','sup',1);

insert into PlayerContract2 values(1,5000000);
insert into PlayerContract2 values(2,1000000);
insert into PlayerContract2 values(3,500000);
insert into PlayerContract2 values(4,200000);
insert into PlayerContract2 values(5,100000);

insert into Pick values('Breathe','Aatrox',1,'S12','World Championship','3.0',25000,'to
p');
insert into Pick values('Peanut','Graves',2,'S12','Mid-Season Invitational','2.0',13000,'j
ungle');
insert into Pick values('Mission','Victor',3,'S11','World Championship','6.0',35000,'mi
d');
insert into Pick values('FBI','Miss Fortune',4,'S11','Mid-Season Invitational','12.0',5500
0,'bot');
insert into Pick values('BeryL','Blitzcrank',5,'S11','LPL summer','8.0',4000,'sup');

insert into Ban values('KENZHU','Aatrox',1,'S12','World Championship',1,0.5);
insert into Ban values('Dong-bin','Graves',2,'S12','Mid-Season Invitational',2,0.3);
insert into Ban values('Achie','Victor',3,'S11','World Championship',3,0.4);
insert into Ban values('Han-gyu','Miss Fortune',4,'S11','Mid-Season Invitational',4,0.8);
insert into Ban values('Anaks','Blitzcrank',5,'S11','LPL summer',5,0.7);

insert into IsGoodAt values('Breathe','Aatrox',1,0.6);
insert into IsGoodAt values('Peanut','Graves',2,0.4);
insert into IsGoodAt values('Mission','Victor',3,0.7);
insert into IsGoodAt values('FBI','Miss Fortune',4,0.3);
insert into IsGoodAt values('BeryL','DRX',5,0.8);

insert into Match('RNG','GenG','S12','World Championship', 1.5);
insert into Match('RNG','CFO','S12','Mid-Season Invitational',2.2);
insert into Match('DRX','100T','S11','World Championship','DRX',1.7);
insert into Match('DRX','RNG','S11','Mid-Season Invitational',4)
insert into Match('RNG','CFO','S11','LPL summer',0.75);
```