DBWS 3

Mohamed Reda Arsalane,Hamza Bouhelal,Badr Essefiany,Said jadouriat

October 2021

1 Mapping approach

1.1 Game_contains_Pieces

We map the *Game* and *Pieces* Entity Sets, the relation *contains* into a relational schema $Game\_contains\_pieces$ with attributes: $Piece\_ID, Position, Game\_ID$; with $Piece\_ID$ and $Position$ as primary keys, and two foreign keys: $Piece\_ID$ referencing $Piece\_ID$ in $Pieces$, and $Game\_ID$ referencing $Game\_ID$ in $Games$.

1.2 Moves_simulate_simulated_game

We map the *Game* and $Moves$ Entity Sets, the relation *simulate* into a relational schema $Moves\_simulate\_simulated\_game$ with attributes: $Name, Game\_ID$; with $Name$ and $Game\_ID$ as primary keys, and two foreign keys: $Name$ referencing $Name$ in $Players$, and $Game\_ID$ referencing $Game\_ID$ in $Games$.

1.3 Player_play_full_game

We map the $Players$ and $FullGame$ Entity Sets, the relation $Play$ into a relational schema $Player\_play\_full\_game$ with attributes: $Game\_ID, Username$; with $Game\_ID$ and $Username$ as primary keys, and two foreign keys: $Username$ referencing $Username$ in $Players$, and $Game\_ID$ referencing $Game\_ID$ in $Games$.

1.4 Players

We map ISA Hierarchy: *Bot* using the first alternative with a relational schema with primary key and foreign key $Username$ which references $Players$ it also has an attribute $Difficulty$. The second alternative is *Player* with primary key and foreign key $Username$ which references $Players$ it also has an attribute $Password$.

1.5 Games

We map ISA Hierarchy: $Full\_game$ using the first alternative with a relational schema with primary key and foreign key $Game\_ID$ which references *Games*

, and the second alternative *Simulated_game* with a relational schema with primary key and foreign key $Game\_ID$ which references *Games*

1.6 Moves

We map ISA Hierarchy: *End_Game* using the first alternative with a relational schema with primary key and foreign key $Game\_ID$ which references *Games* , it also has an additional attribute *board_state* which represents the initial state of the board at the star of the simulation, and the second alternative *Openings* with a relational schema with primary key and foreign key $Names$ which references $Moves$.

1.7 ER Diagram: