University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Milestone 4

Milestone #: 4

Date: Apr 2, 2024

Group Number: 54

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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.

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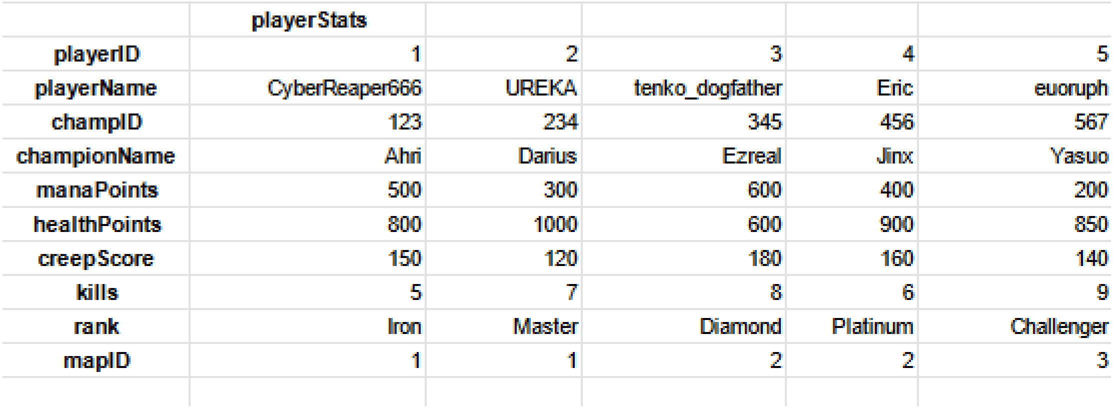
Project Description

We aim to create a database application that displays match information for League Of Legends, an online video game where two teams of players fight to destroy the other team's home base. Users may query information about the live state of an online match such as player strength statistics and the progress of destroyed structures.
The user will login to their oracle account and then can insert, delete, and update a playerStat, select a playerStat, project on a playerStat, see all the players that have destroyed a turret on a given mapID, find the count of ownItems in all games, find the ownItems where 2 or more players own, find the items that are owned by everyone, showing all the ownItems, and showing all the playerStats.

Schema

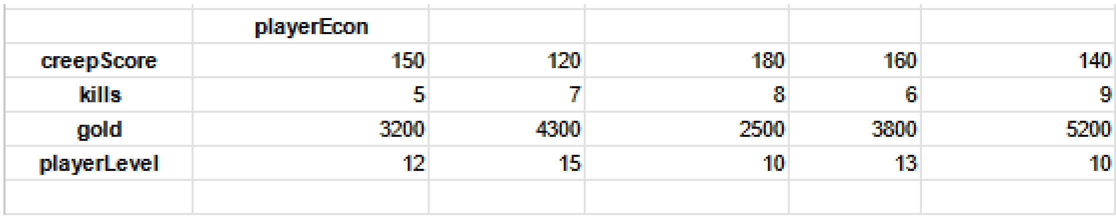
One change in our schema was adding the playerName to playerStats so that we can accurately represent the player's username instead of just displaying them by their key which would be unknown to the user at that time. Other minor changes are the renaming of "location" in all structures to "structureLocation", and "type" in the dragon tables to "dragonType", this was to make the attributes more clear.

playerStats(<u>playerID</u>, playerName, champID, championName, manaPoints,
healthPoints, creepScore, **kills**, **rank**, **mapID**),



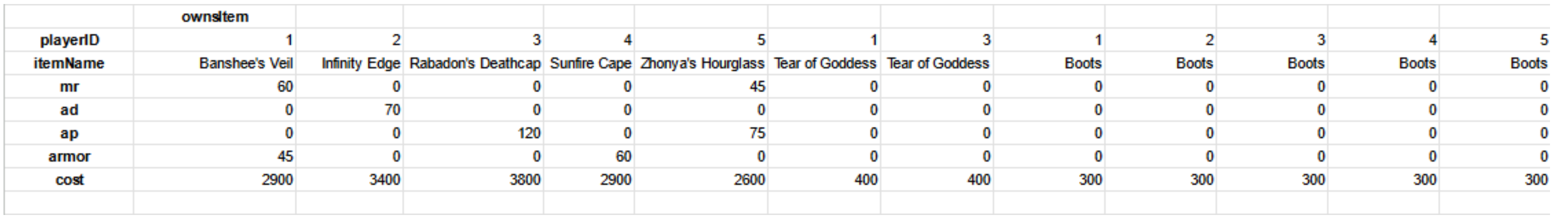
	playerStats				
playerID	1	2	3	4	5
playerName	CyberReaper666	UREKA	tenko_dogfather	Eric	euoruph
champID	123	234	345	456	567
championName	Ahri	Darius	Ezreal	Jinx	Yasuo
manaPoints	500	300	600	400	200
healthPoints	800	1000	600	900	850
creepScore	150	120	180	160	140
kills	5	7	8	6	9
rank	Iron	Master	Diamond	Platinum	Challenger
mapID	1	1	2	2	3

playerEcon(creepScore**,** kills, gold, level)



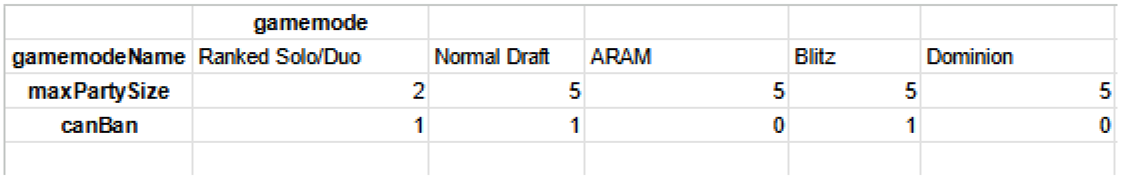
	playerEcon				
creepScore	150	120	180	160	140
kills	5	7	8	6	9
gold	3200	4300	2500	3800	5200
playerLevel	12	15	10	13	10

ownsItem(**playerID**, itemName, mr, ad, ap, armor, cost)



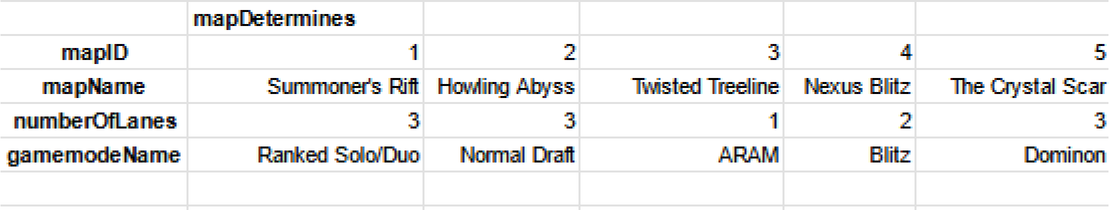
	ownsItem											
playerID	1	2	3	4	5	1	3	1	2	3	4	5
itemName	Banshee's Veil	Infinity Edge	Rabadon's Deathcap	Sunfire Cape	Zhonya's Hourglass	Tear of Goddess	Tear of Goddess	Boots	Boots	Boots	Boots	Boots
mr	60	0	0	0	45	0	0	0	0	0	0	0
ad	0	70	0	0	0	0	0	0	0	0	0	0
ap	0	0	120	0	75	0	0	0	0	0	0	0
armor	45	0	0	60	0	0	0	0	0	0	0	0
cost	2900	3400	3800	2900	2600	400	400	300	300	300	300	300

gameMode(gamemodeName, maxPartySize, canBan)



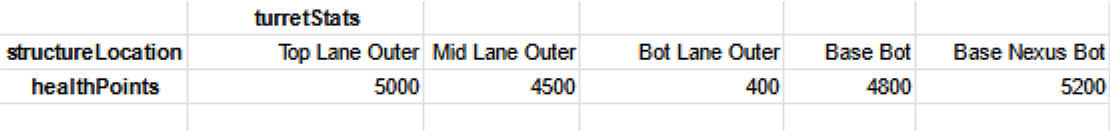
	gamemode				
gamemodeName	Ranked Solo/Duo	Normal Draft	ARAM	Blitz	Dominion
maxPartySize	2	5	5	5	5
canBan	1	1	0	1	0

mapDetermines(mapID, numberOfLanes, **gamemodeName**)



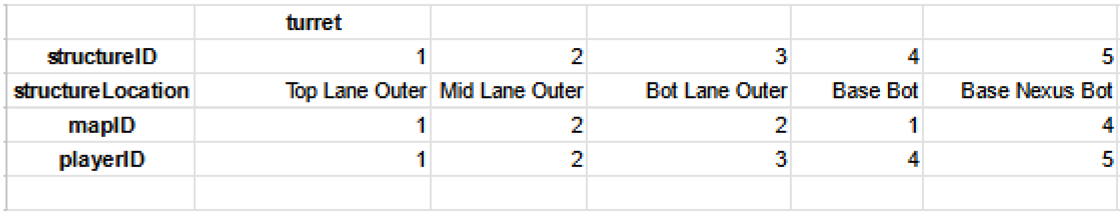
	mapDetermines				
mapID	1	2	3	4	5
mapName	Summoner's Rift	Howling Abyss	Twisted Treeline	Nexus Blitz	The Crystal Scar
numberOfLanes	3	3	1	2	3
gamemodeName	Ranked Solo/Duo	Normal Draft	ARAM	Blitz	Dominon

turretStats(structureLocation, healthPoints)



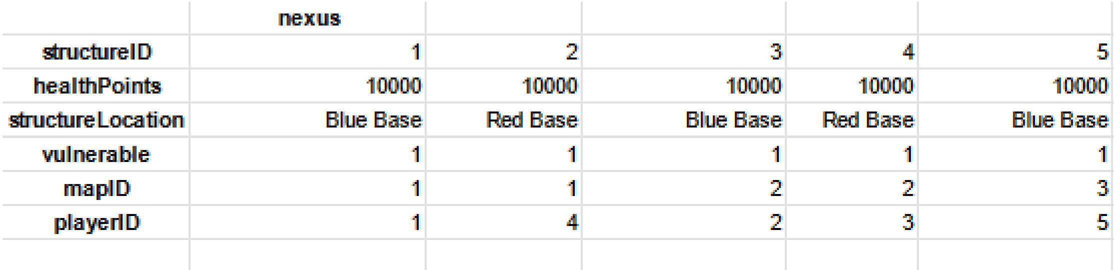
	turretStats				
structureLocation	Top Lane Outer	Mid Lane Outer	Bot Lane Outer	Base Bot	Base Nexus Bot
healthPoints	5000	4500	400	4800	5200

turretDamage(**structureLocation**, damage) turret(structureID, **structureLocation**, **mapID**, **playerID**)



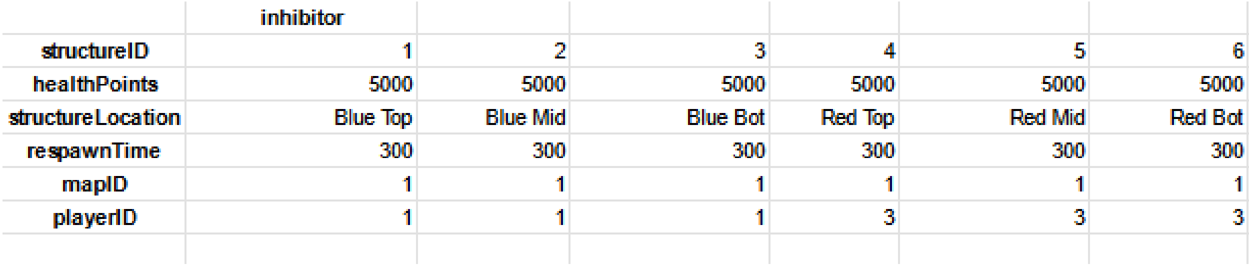
	turret				
structureID	1	2	3	4	5
structureLocation	Top Lane Outer	Mid Lane Outer	Bot Lane Outer	Base Bot	Base Nexus Bot
mapID	1	2	2	1	4
playerID	1	2	3	4	5

nexus(structureID, healthPoints, structureLocation, vulnerable, integer, **mapID**, **playerID**)



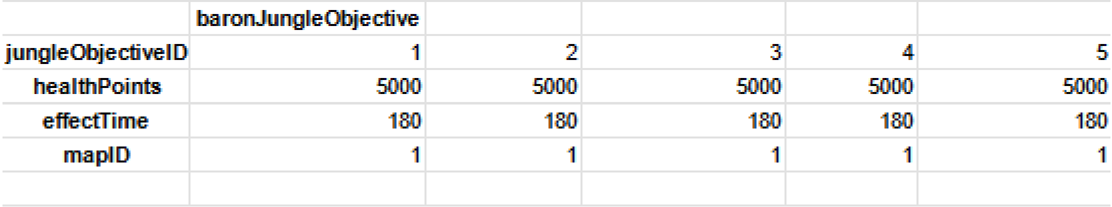
	nexus				
structureID	1	2	3	4	5
healthPoints	10000	10000	10000	10000	10000
structureLocation	Blue Base	Red Base	Blue Base	Red Base	Blue Base
vulnerable	1	1	1	1	1
mapID	1	1	2	2	3
playerID	1	4	2	3	5

inhibitor(structureID, healthPoints, structureLocation, respawnTime, integer, **mapID**, **playerID**)



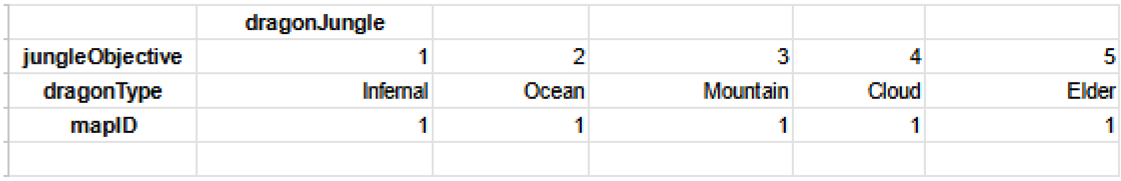
	inhibitor					
structureID	1	2	3	4	5	6
healthPoints	5000	5000	5000	5000	5000	5000
structureLocation	Blue Top	Blue Mid	Blue Bot	Red Top	Red Mid	Red Bot
respawnTime	300	300	300	300	300	300
mapID	1	1	1	1	1	1
playerID	1	1	1	3	3	3

baronJungleObjective(jungleObjectiveID, healthPoints, effectTime, **mapID**)



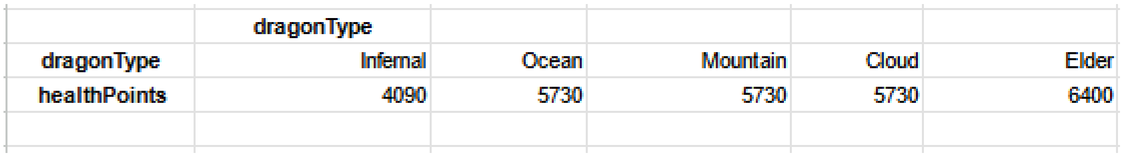
	baronJungleObjective				
jungleObjectiveID	1	2	3	4	5
healthPoints	5000	5000	5000	5000	5000
effectTime	180	180	180	180	180
mapID	1	1	1	1	1

dragonJungle(jungleObjectiveID, **dragonType**, **mapID**)



	dragonJungle				
jungleObjective	1	2	3	4	5
dragonType	Infernal	Ocean	Mountain	Cloud	Elder
mapID	1	1	1	1	1

dragonType(dragonType, healthpoints)



	dragonType				
dragonType	Infernal	Ocean	Mountain	Cloud	Elder
healthPoints	4090	5730	5730	5730	6400

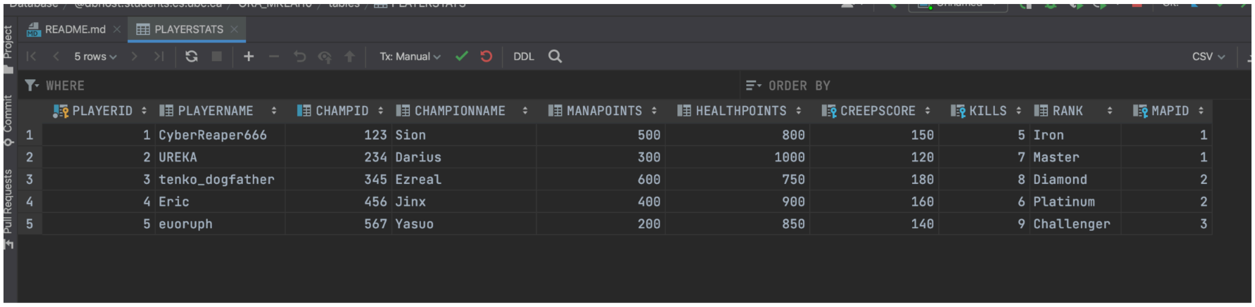
Query List and Locations

All queries are located in `src/database/DatabaseConnectionHandler.java`

Query	Line Number
Insert	267
Delete	240
Update	481
Selection	387
Projection	607 (show all tables), 632 (show selected playerStats attributes)
Join	339
Aggregation with Group By	139
Aggregation with Group By and Having	166
Nested Aggregation with Group By	197
Division	777

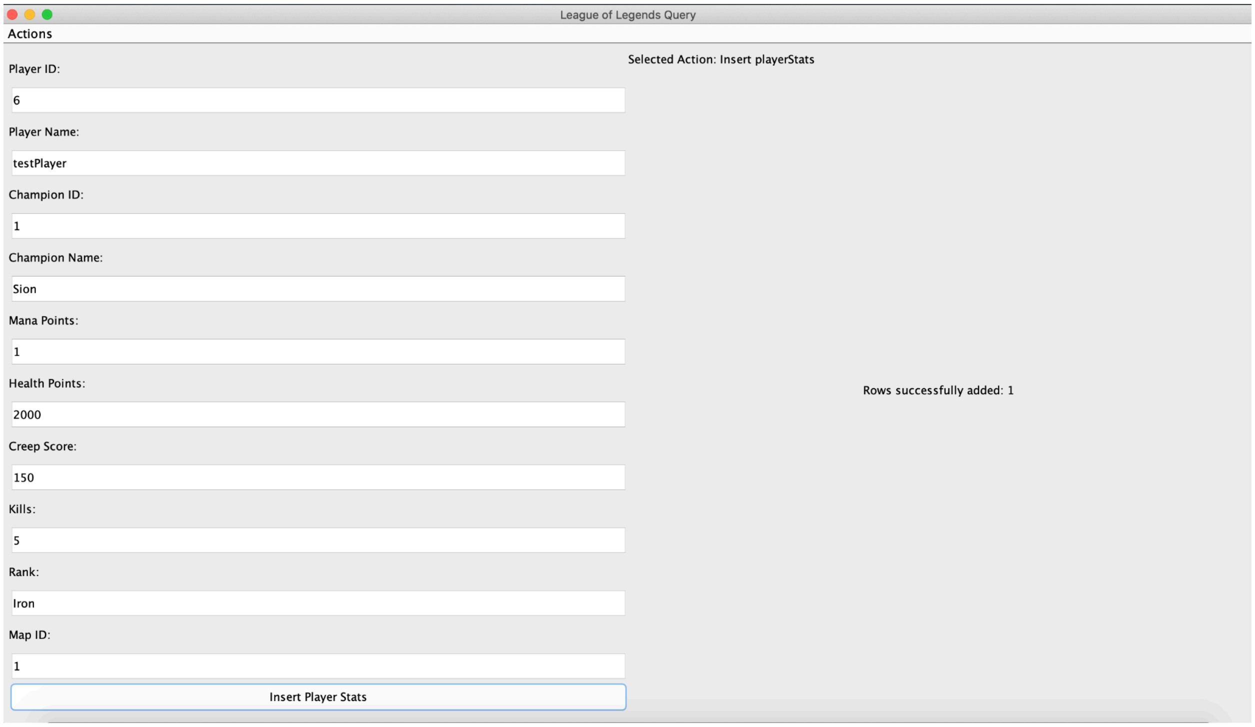
Database and GUI Screenshots

Insert



	PLAYERID	PLAYERNAME	CHAMPID	CHAMPIONNAME	MANAPOINTS	HEALTHPOINTS	CREEPSCORE	KILLS	RANK	MAPID
1	1	CyberReaper666	123	Sion	500	800	150	5	Iron	1
2	2	UREKA	234	Darius	300	1000	120	7	Master	1
3	3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

- playerStats before insert



Selected Action: Insert playerStats

Player ID: 6

Player Name: testPlayer

Champion ID: 1

Champion Name: Sion

Mana Points: 1

Health Points: 2000

Creep Score: 150

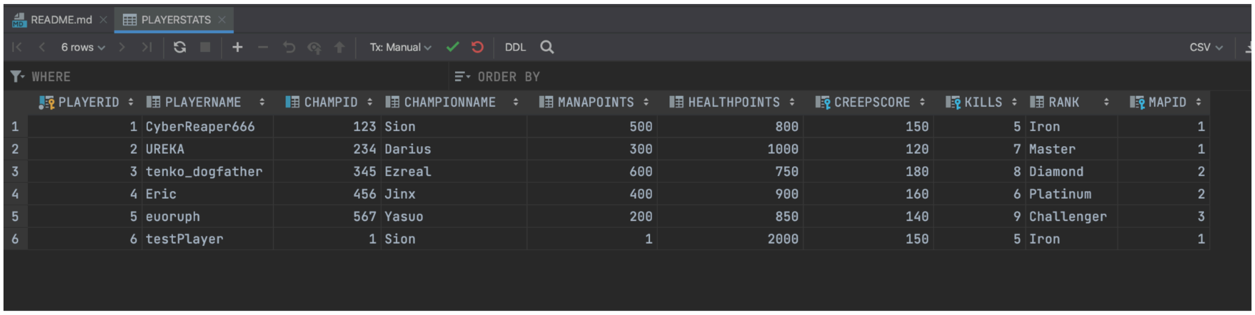
Kills: 5

Rank: Iron

Map ID: 1

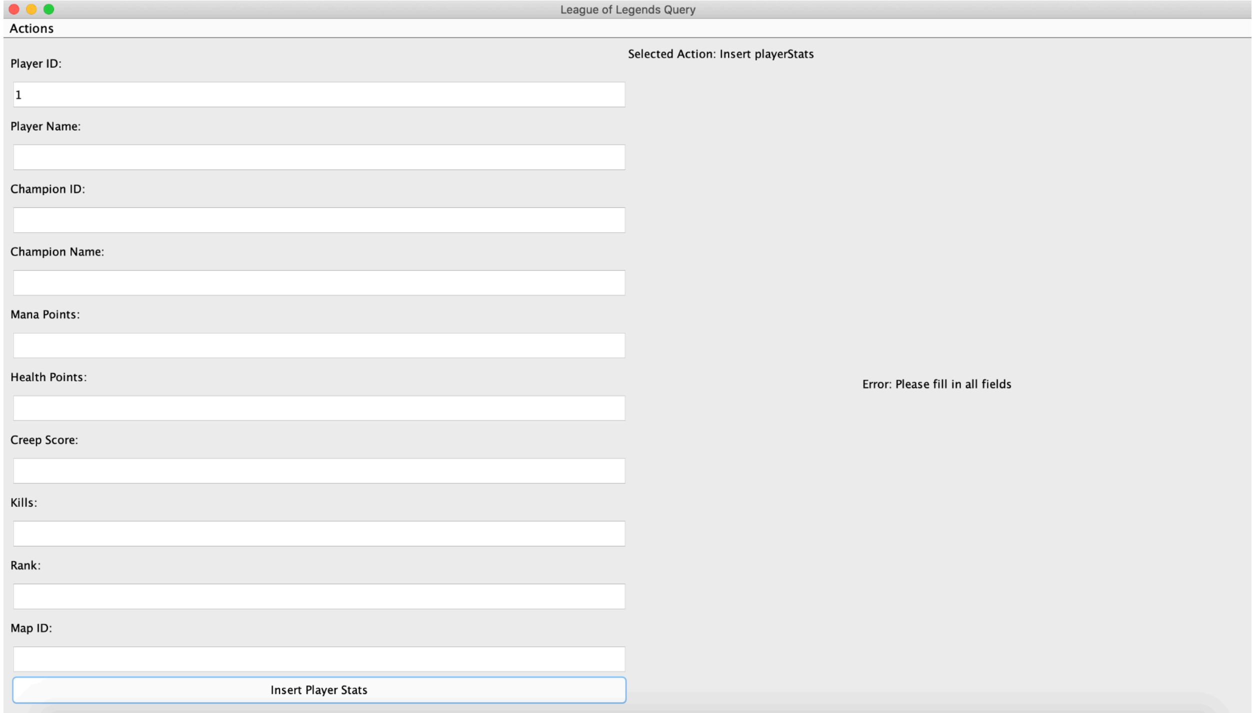
Rows successfully added: 1

- GUI for insert PlayerStats with valid insert details



	PLAYERID	PLAYERNAME	CHAMPID	CHAMPIONNAME	MANAPOINTS	HEALTHPOINTS	CREEPSCORE	KILLS	RANK	MAPID
1	1	CyberReaper666	123	Sion	500	800	150	5	Iron	1
2	2	UREKA	234	Darius	300	1000	120	7	Master	1
3	3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	5	euoruph	567	Yasuo	200	850	140	9	Challenger	3
6	6	testPlayer	1	Sion	1	2000	150	5	Iron	1

- playerStats after valid insert



Selected Action: Insert playerStats

Player ID: 1

Player Name:

Champion ID:

Champion Name:

Mana Points:

Health Points:

Creep Score:

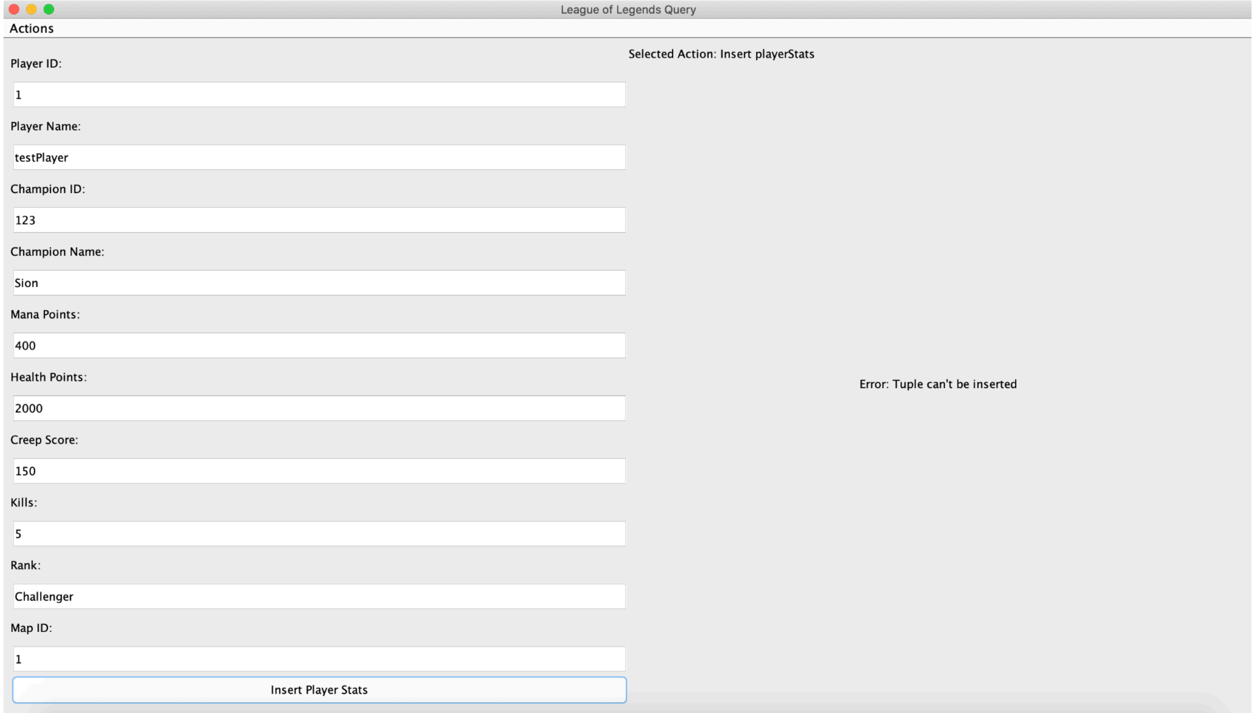
Kills:

Rank:

Map ID:

Error: Please fill in all fields

- Error message when not all fields are filled



Selected Action: Insert playerStats

Player ID: 1

Player Name: testPlayer

Champion ID: 123

Champion Name: Sion

Mana Points: 400

Health Points: 2000

Creep Score: 150

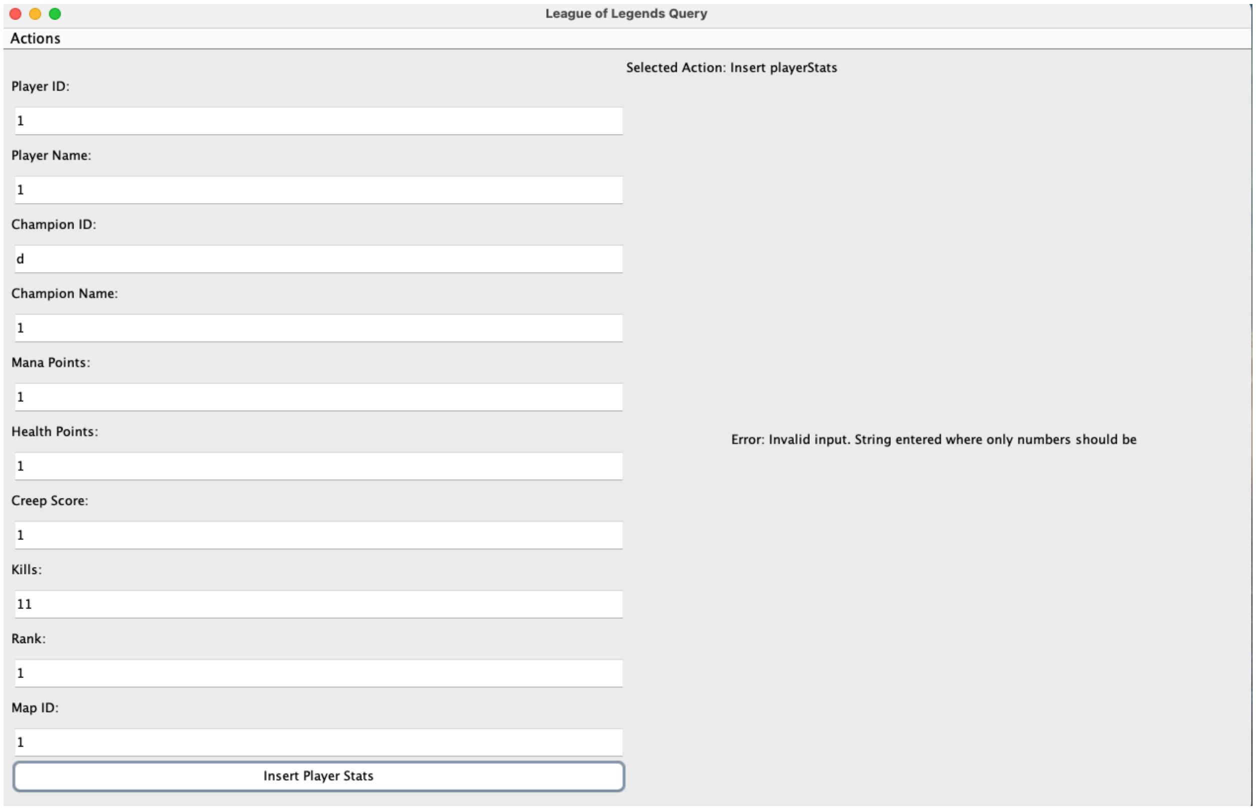
Kills: 5

Rank: Challenger

Map ID: 1

Error: Tuple can't be inserted

- Error message when unique constraint is violated



Selected Action: Insert playerStats

Player ID: 1

Player Name: 1

Champion ID: d

Champion Name: 1

Mana Points: 1

Health Points: 1

Creep Score: 1

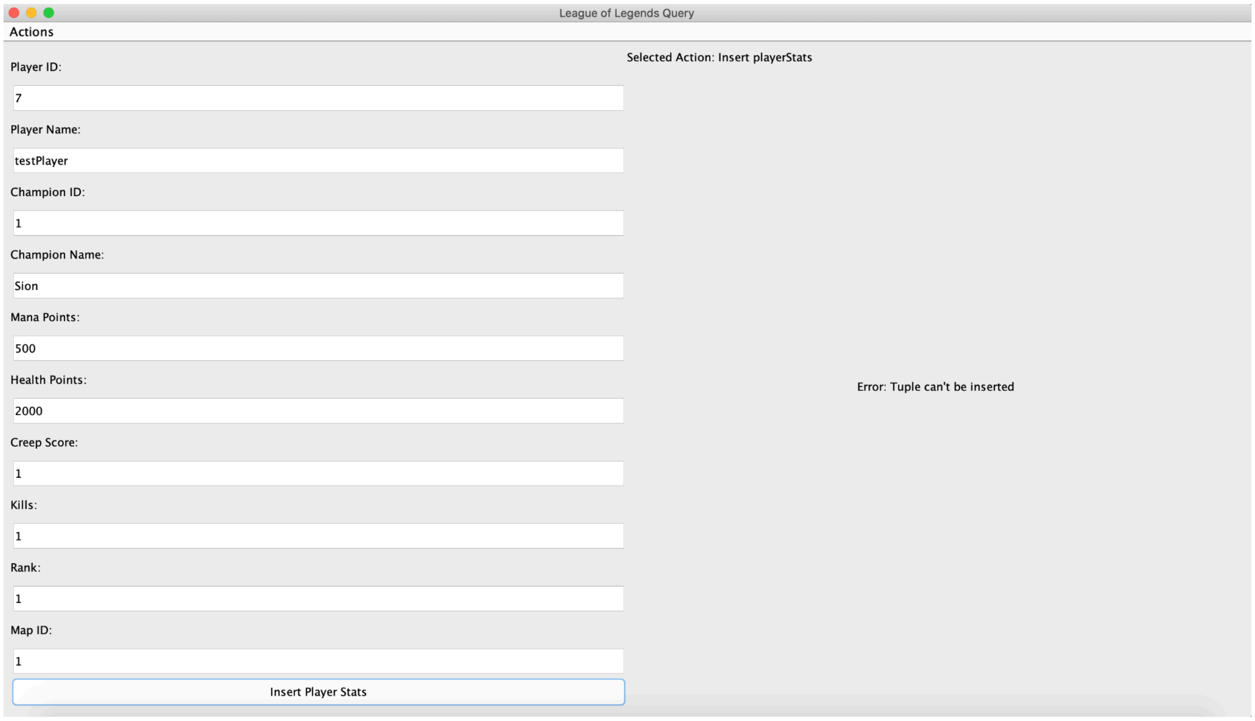
Kills: 11

Rank: 1

Map ID: 1

Error: Invalid input. String entered where only numbers should be

- Error message when string entered where only numbers should go



Selected Action: Insert playerStats

Player ID: 7

Player Name: testPlayer

Champion ID: 1

Champion Name: Sion

Mana Points: 500

Health Points: 2000

Creep Score: 1

Kills: 1

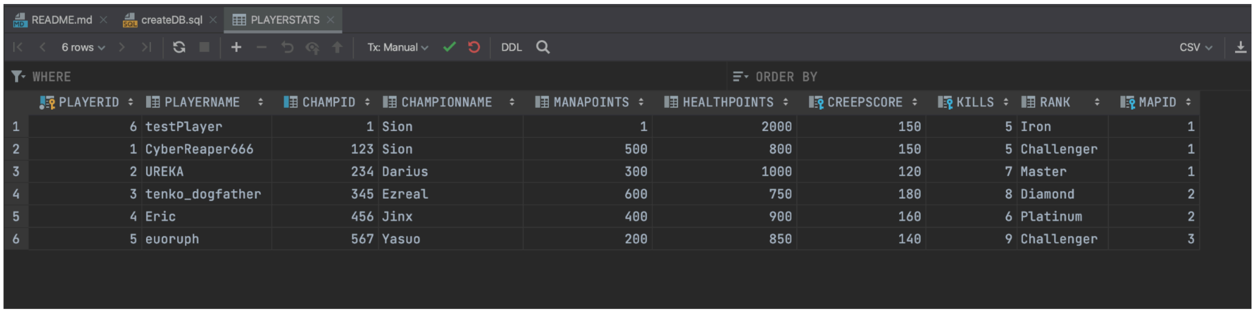
Rank: 1

Map ID: 1

Error: Tuple can't be inserted

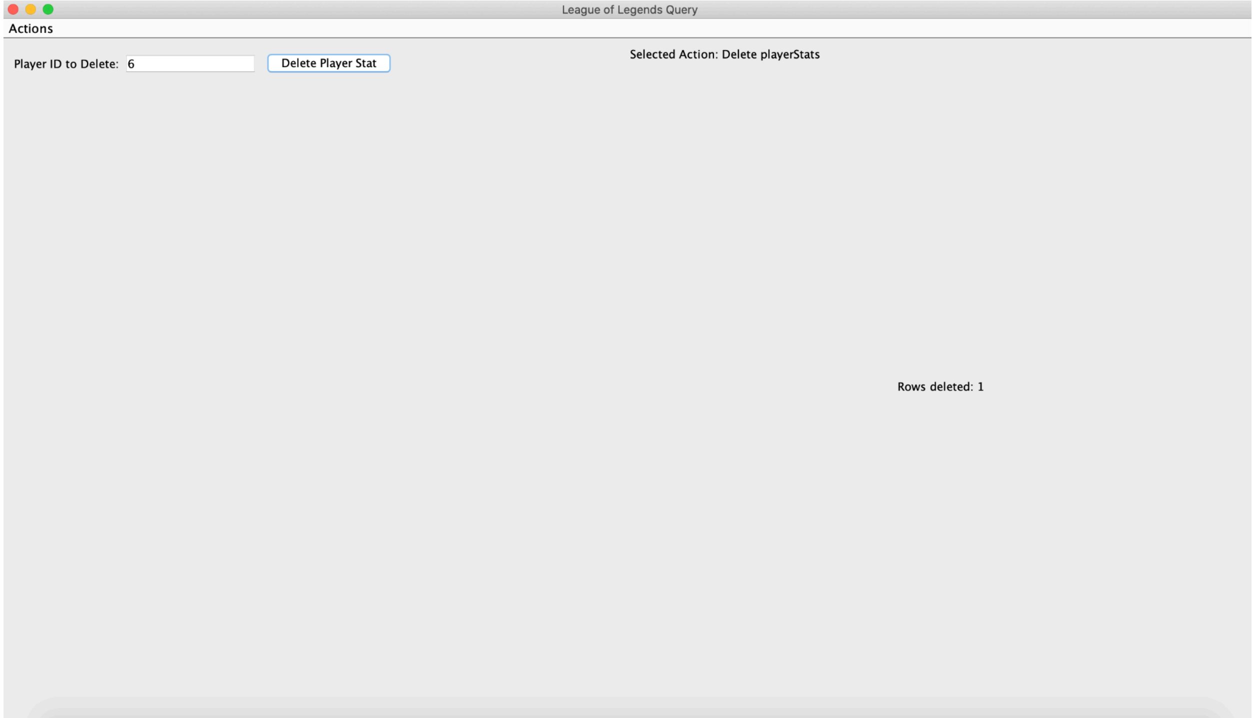
- Error message when the foreign keys do not exist in the other table

Delete



	PLAYERID	PLAYERNAME	CHAMPID	CHAMPIONNAME	MANAPOINTS	HEALTHPOINTS	CREEPSCORE	KILLS	RANK	MAPID
1	6	testPlayer	1	Sion	1	2000	150	5	Iron	1
2	1	CyberReaper666	123	Sion	500	800	150	5	Challenger	1
3	2	UREKA	234	Darius	300	1000	120	7	Master	1
4	3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
5	4	Eric	456	Jinx	400	900	160	6	Platinum	2
6	5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

- playerStats before delete

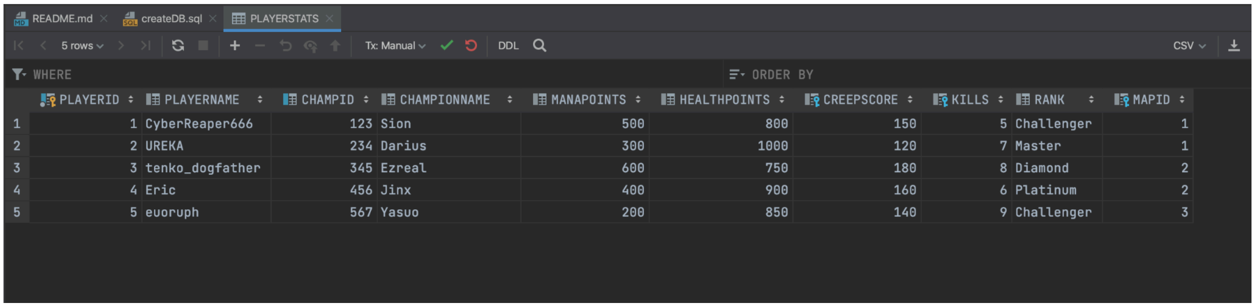


Player ID to Delete: 6

Selected Action: Delete playerStats

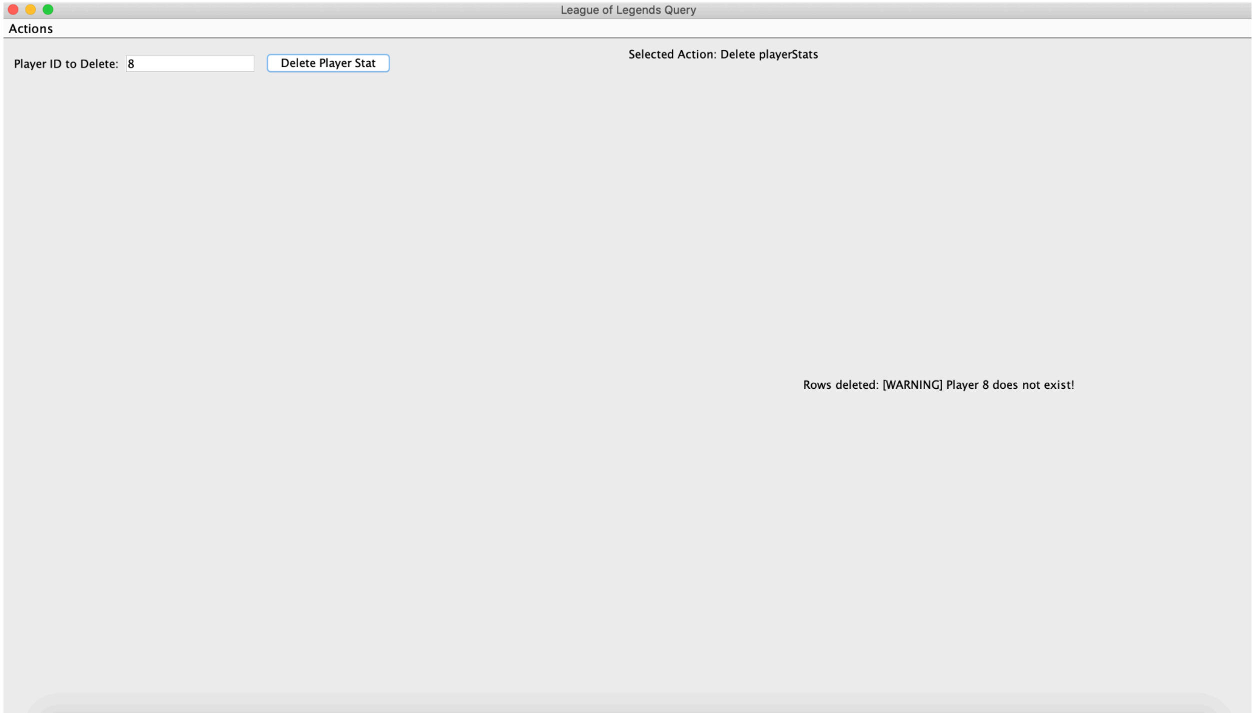
Rows deleted: 1

- Gui with deleting player with playerID = 6



	PLAYERID	PLAYERNAME	CHAMPID	CHAMPIONNAME	MANAPOINTS	HEALTHPOINTS	CREEPSCORE	KILLS	RANK	MAPID
1	1	CyberReaper666	123	Sion	500	800	150	5	Challenger	1
2	2	UREKA	234	Darius	300	1000	120	7	Master	1
3	3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

- playerStats after delete

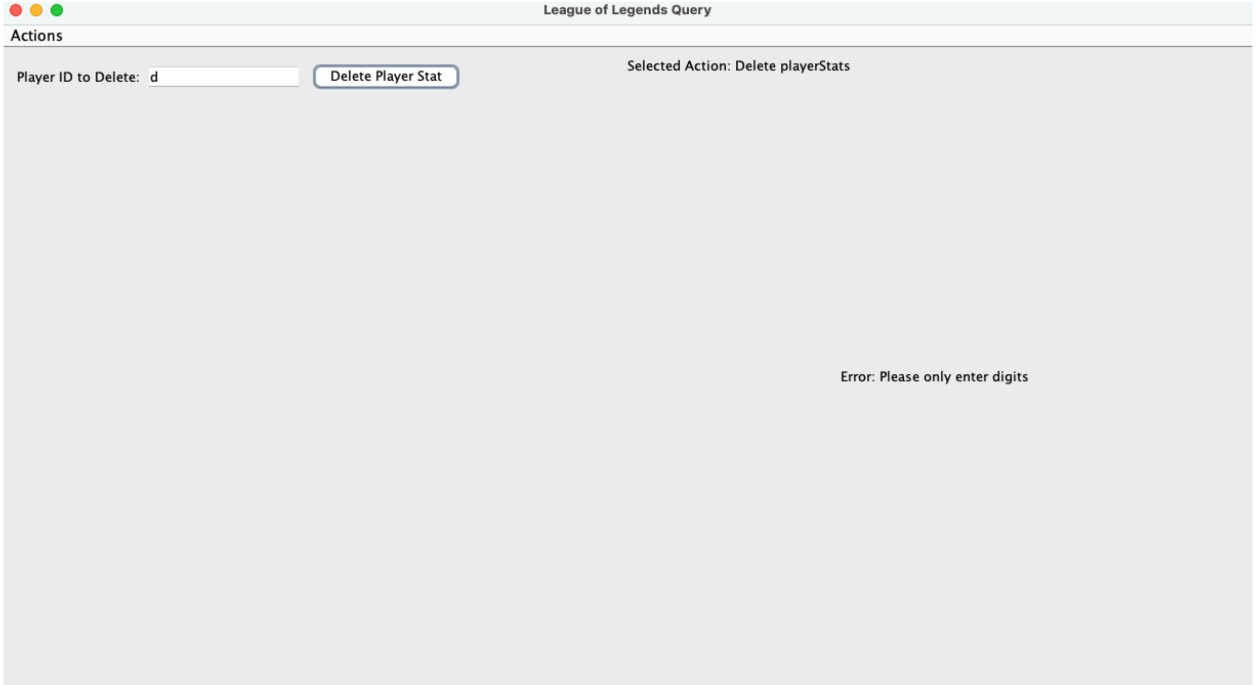


Player ID to Delete: 8

Selected Action: Delete playerStats

Rows deleted: [WARNING] Player 8 does not exist!

- Error message when playerID inputted doesn’t exist

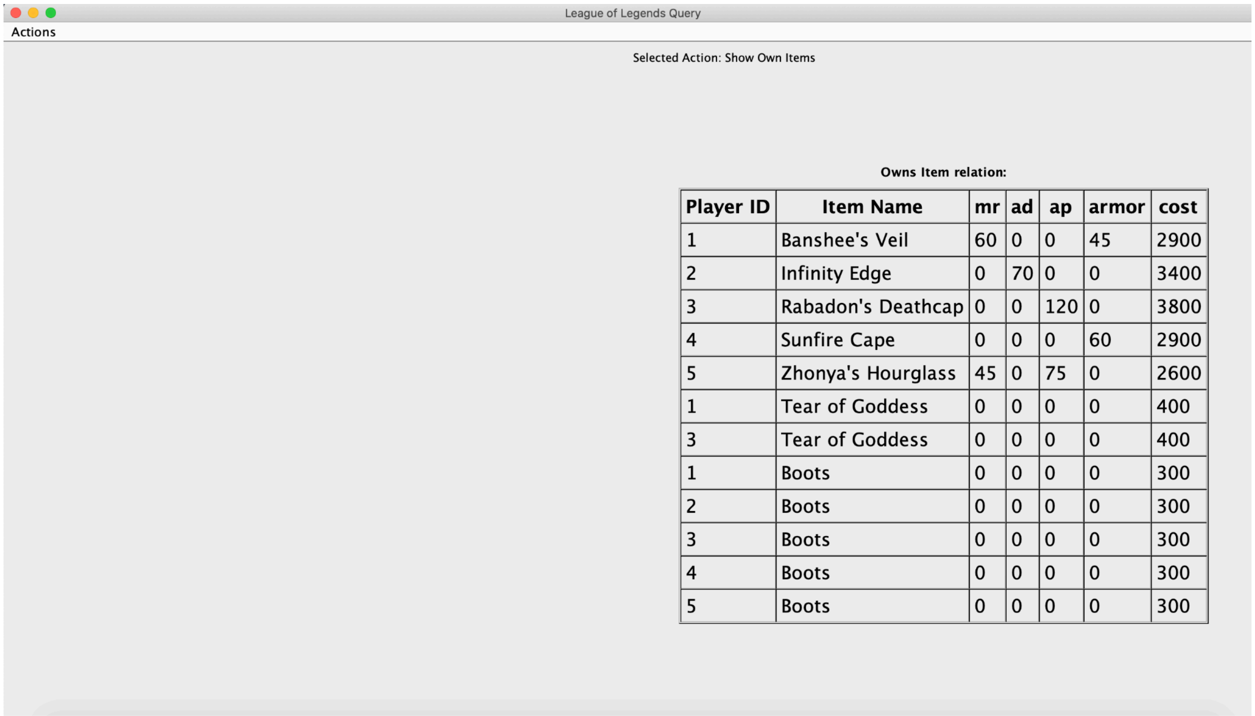


Player ID to Delete: d

Selected Action: Delete playerStats

Error: Please only enter digits

- Error message when user tries to enter an input containing non-numbers

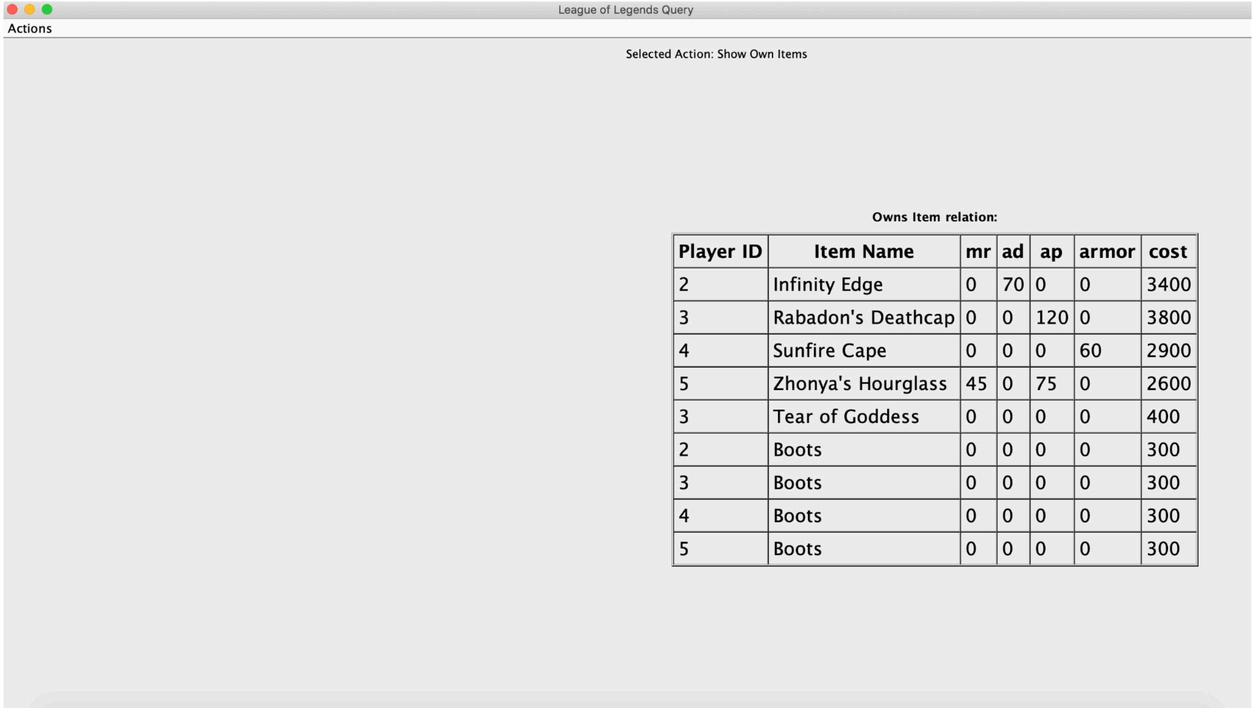


Selected Action: Show Own Items

Owns Item relation:

Player ID	Item Name	mr	ad	ap	armor	cost
1	Banshee's Veil	60	0	0	45	2900
2	Infinity Edge	0	70	0	0	3400
3	Rabadon's Deathcap	0	0	120	0	3800
4	Sunfire Cape	0	0	0	60	2900
5	Zhonya's Hourglass	45	0	75	0	2600
1	Tear of Goddess	0	0	0	0	400
3	Tear of Goddess	0	0	0	0	400
1	Boots	0	0	0	0	300
2	Boots	0	0	0	0	300
3	Boots	0	0	0	0	300
4	Boots	0	0	0	0	300
5	Boots	0	0	0	0	300

- ownsItem table before deleting player with playerID = 1 from playerStats



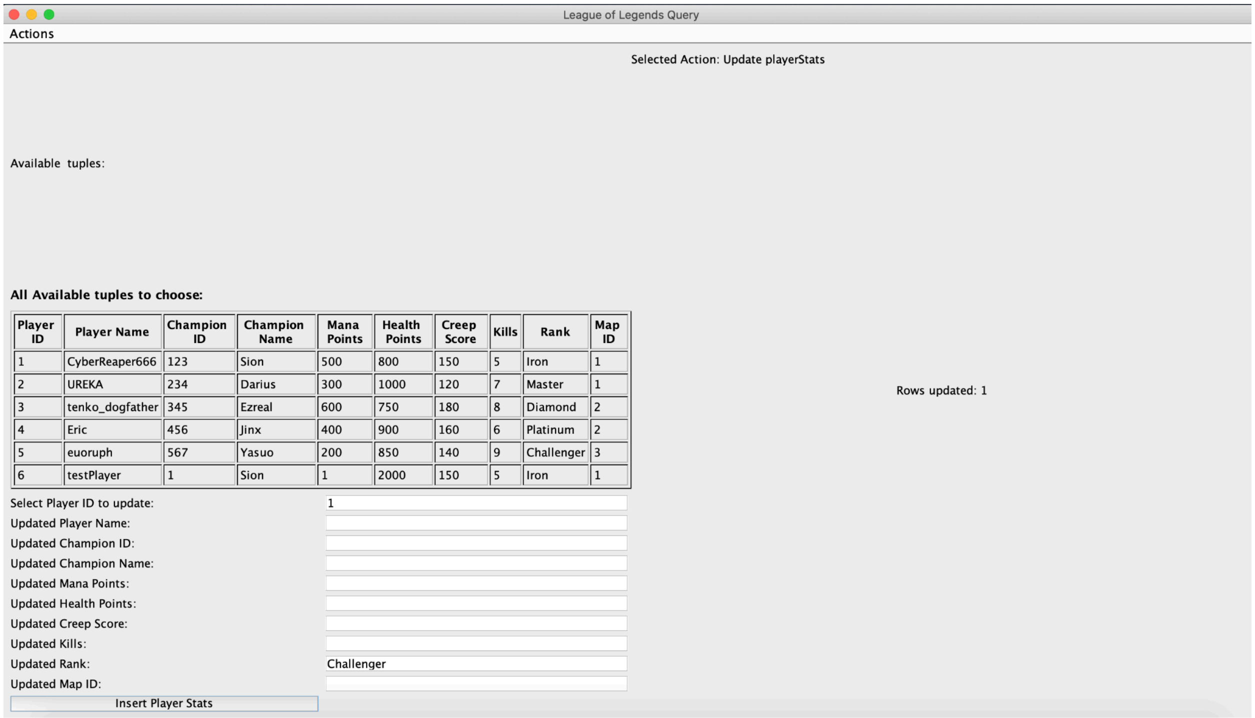
Selected Action: Show Own Items

Owns Item relation:

Player ID	Item Name	mr	ad	ap	armor	cost
2	Infinity Edge	0	70	0	0	3400
3	Rabadon's Deathcap	0	0	120	0	3800
4	Sunfire Cape	0	0	0	60	2900
5	Zhonya's Hourglass	45	0	75	0	2600
3	Tear of Goddess	0	0	0	0	400
2	Boots	0	0	0	0	300
3	Boots	0	0	0	0	300
4	Boots	0	0	0	0	300
5	Boots	0	0	0	0	300

- ownsItem table after deleting player with playerID = 1 from playerStats

Update



Selected Action: Update playerStats

Available tuples:

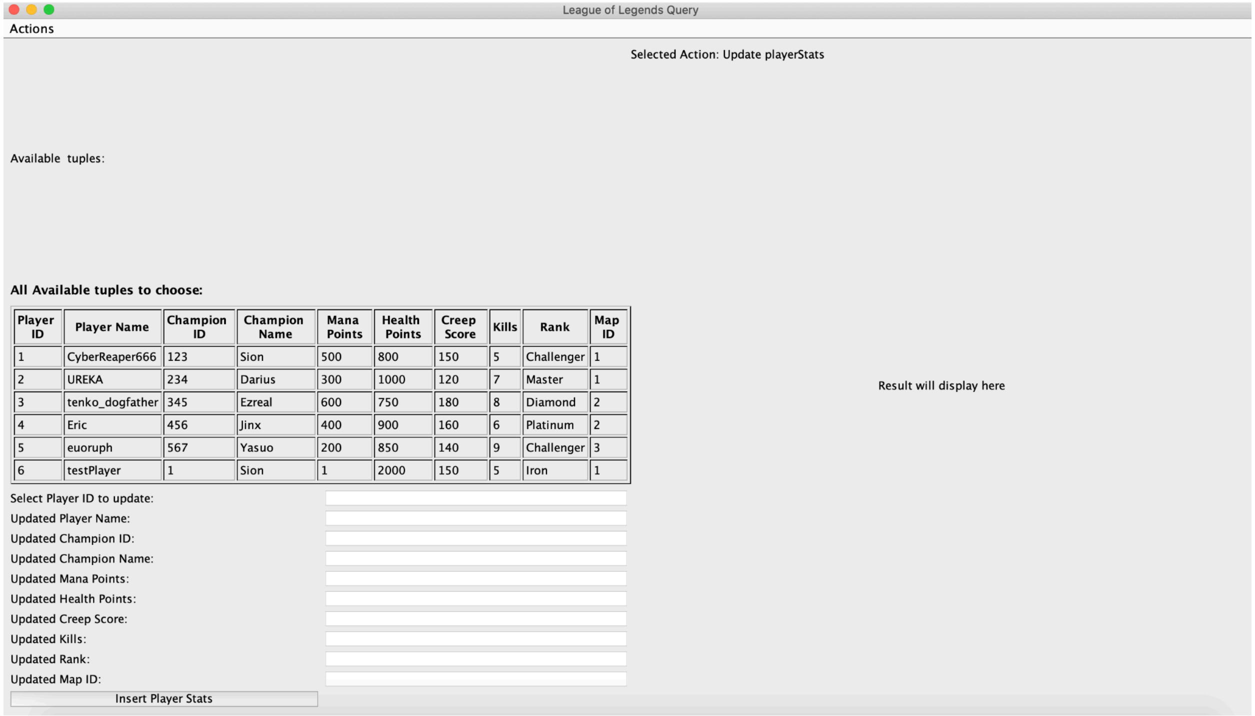
All Available tuples to choose:

Player ID	Player Name	Champion ID	Champion Name	Mana Points	Health Points	Creep Score	Kills	Rank	Map ID
1	CyberReaper666	123	Sion	500	800	150	5	Iron	1
2	UREKA	234	Darius	300	1000	120	7	Master	1
3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	euoruph	567	Yasuo	200	850	140	9	Challenger	3
6	testPlayer	1	Sion	1	2000	150	5	Iron	1

Rows updated: 1

Select Player ID to update: 1
Updated Player Name:
Updated Champion ID:
Updated Champion Name:
Updated Mana Points:
Updated Health Points:
Updated Creep Score:
Updated Kills:
Updated Rank: Challenger
Updated Map ID:

- GUI for update with inputs for updating player with playerID = 1 to have rank Challenger



Selected Action: Update playerStats

Available tuples:

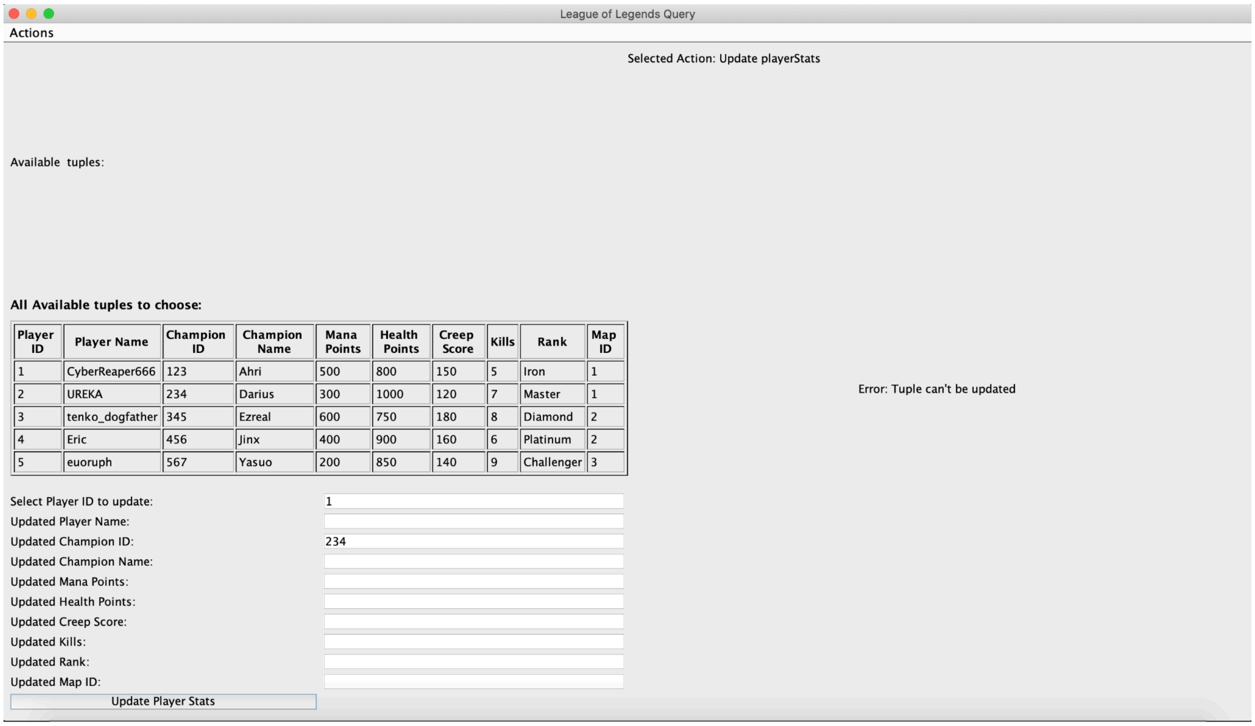
All Available tuples to choose:

Player ID	Player Name	Champion ID	Champion Name	Mana Points	Health Points	Creep Score	Kills	Rank	Map ID
1	CyberReaper666	123	Sion	500	800	150	5	Challenger	1
2	UREKA	234	Darius	300	1000	120	7	Master	1
3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	euoruph	567	Yasuo	200	850	140	9	Challenger	3
6	testPlayer	1	Sion	1	2000	150	5	Iron	1

Result will display here

Select Player ID to update:
Updated Player Name:
Updated Champion ID:
Updated Champion Name:
Updated Mana Points:
Updated Health Points:
Updated Creep Score:
Updated Kills:
Updated Rank:
Updated Map ID:

- Table after the update



Selected Action: Update playerStats

Available tuples:

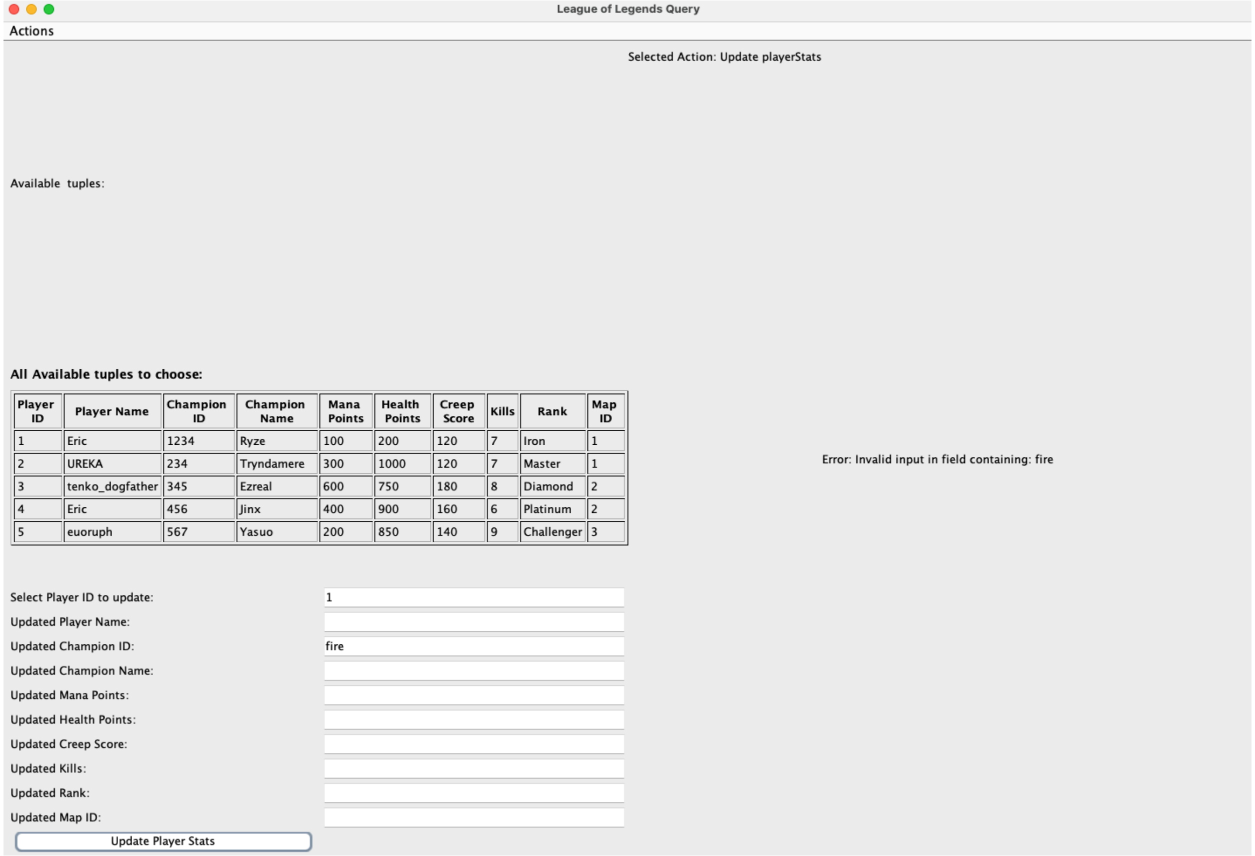
All Available tuples to choose:

Player ID	Player Name	Champion ID	Champion Name	Mana Points	Health Points	Creep Score	Kills	Rank	Map ID
1	CyberReaper666	123	Ahri	500	800	150	5	Iron	1
2	UREKA	234	Darius	300	1000	120	7	Master	1
3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

Error: Tuple can't be updated

Select Player ID to update: 1
Updated Player Name:
Updated Champion ID: 234
Updated Champion Name:
Updated Mana Points:
Updated Health Points:
Updated Creep Score:
Updated Kills:
Updated Rank:
Updated Map ID:

- Error message when unique constraint violated, same for foreign key violation



Selected Action: Update playerStats

Available tuples:

All Available tuples to choose:

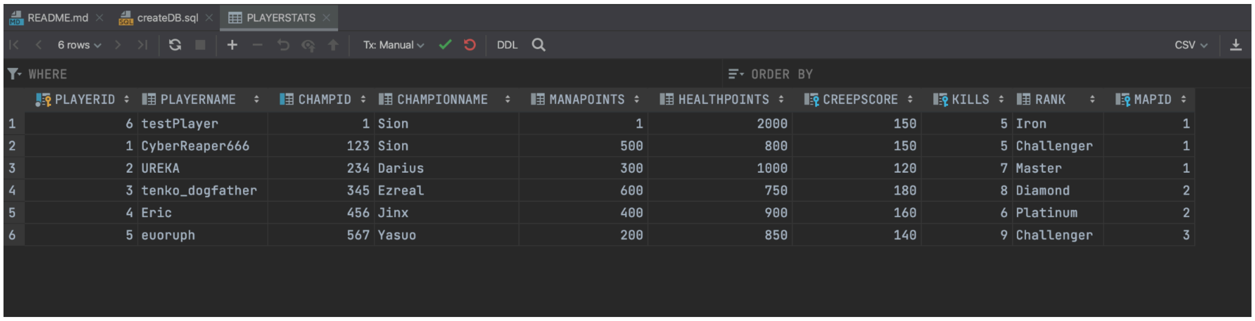
Player ID	Player Name	Champion ID	Champion Name	Mana Points	Health Points	Creep Score	Kills	Rank	Map ID
1	Eric	1234	Ryze	100	200	120	7	Iron	1
2	UREKA	234	Tryndamere	300	1000	120	7	Master	1
3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
4	Eric	456	Jinx	400	900	160	6	Platinum	2
5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

Error: Invalid input in field containing: fire

Select Player ID to update: 1
Updated Player Name:
Updated Champion ID: fire
Updated Champion Name:
Updated Mana Points:
Updated Health Points:
Updated Creep Score:
Updated Kills:
Updated Rank:
Updated Map ID:

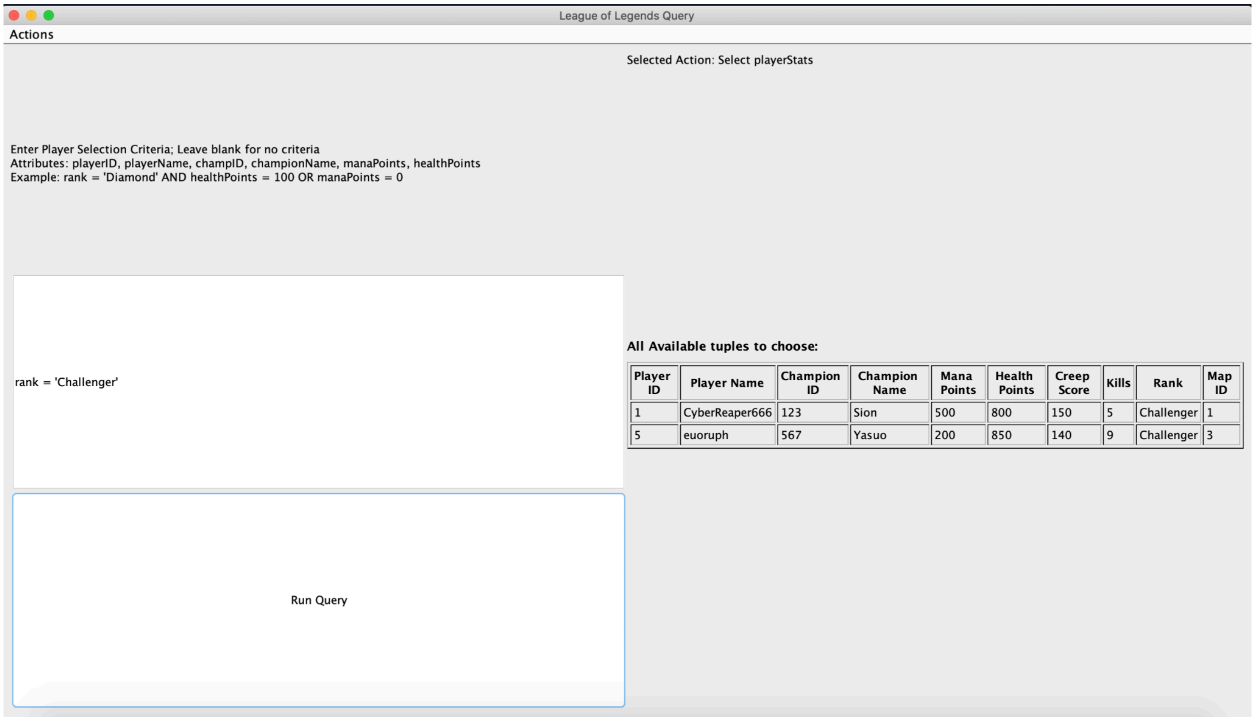
- Error message if user enters string where only integers should go

Selection



	PLAYERID	PLAYERNAME	CHAMPID	CHAMPIONNAME	MANAPOINTS	HEALTHPOINTS	CREEPSCORE	KILLS	RANK	MAPID
1	6	testPlayer	1	Sion	1	2000	150	5	Iron	1
2	1	CyberReaper666	123	Sion	500	800	150	5	Challenger	1
3	2	UREKA	234	Darius	300	1000	120	7	Master	1
4	3	tenko_dogfather	345	Ezreal	600	750	180	8	Diamond	2
5	4	Eric	456	Jinx	400	900	160	6	Platinum	2
6	5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

- playerStats currently



Selected Action: Select playerStats

Enter Player Selection Criteria; Leave blank for no criteria
Attributes: playerID, playerName, champID, championName, manaPoints, healthPoints
Example: rank = 'Diamond' AND healthPoints = 100 OR manaPoints = 0

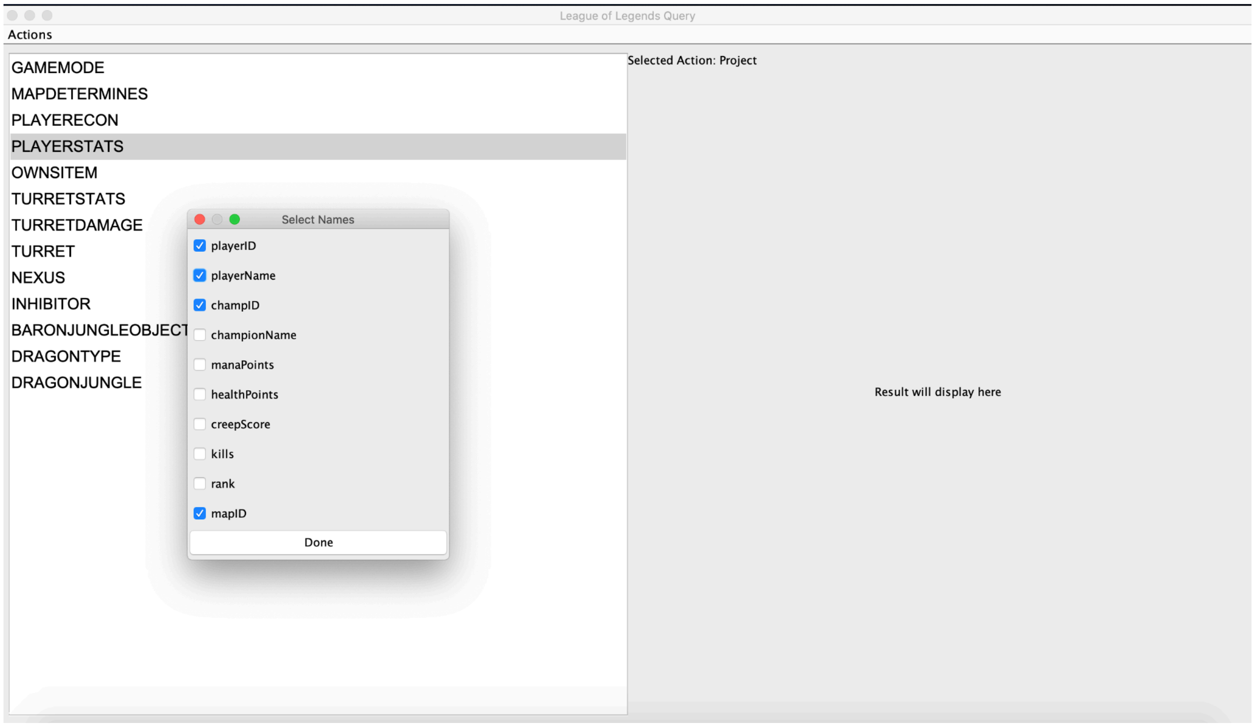
rank = 'Challenger'

All Available tuples to choose:

Player ID	Player Name	Champion ID	Champion Name	Mana Points	Health Points	Creep Score	Kills	Rank	Map ID
1	CyberReaper666	123	Sion	500	800	150	5	Challenger	1
5	euoruph	567	Yasuo	200	850	140	9	Challenger	3

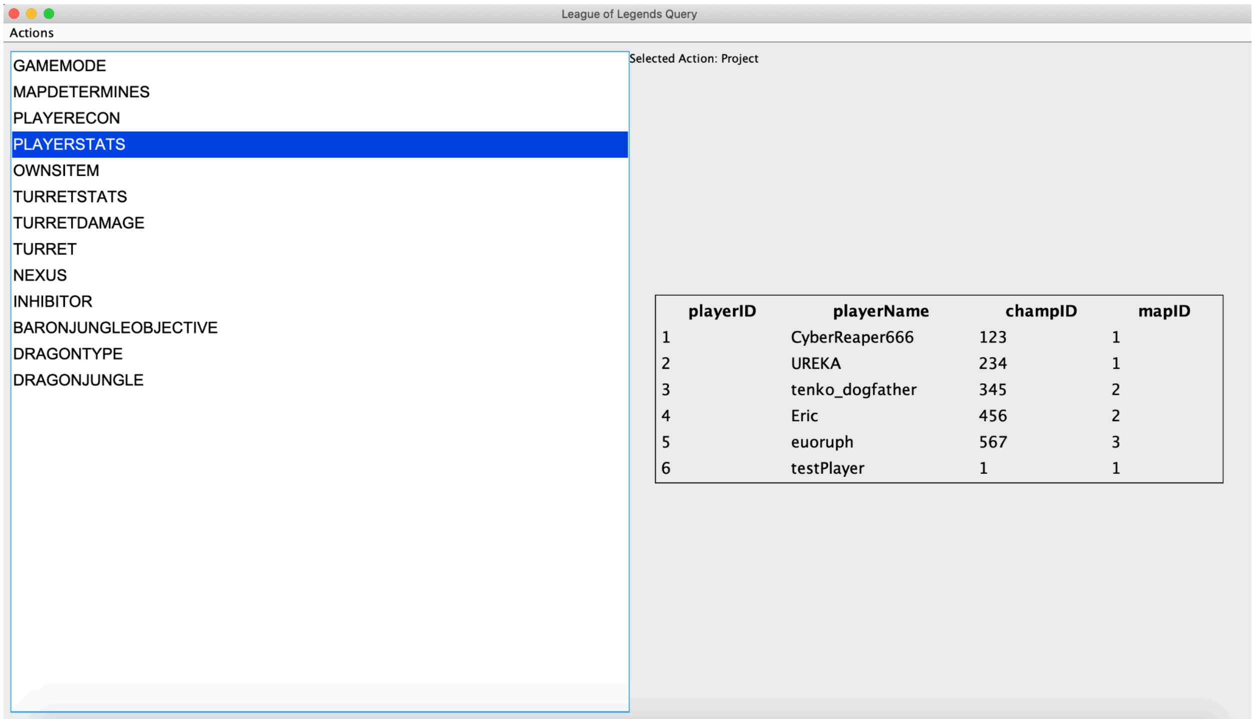
- GUI input and output for selecting players with rank = ‘Challenger’

Projection



☑ playerID
☑ playerName
☑ champID
□ championName
□ manaPoints
□ healthPoints
□ creepScore
□ kills
□ rank
☑ mapID

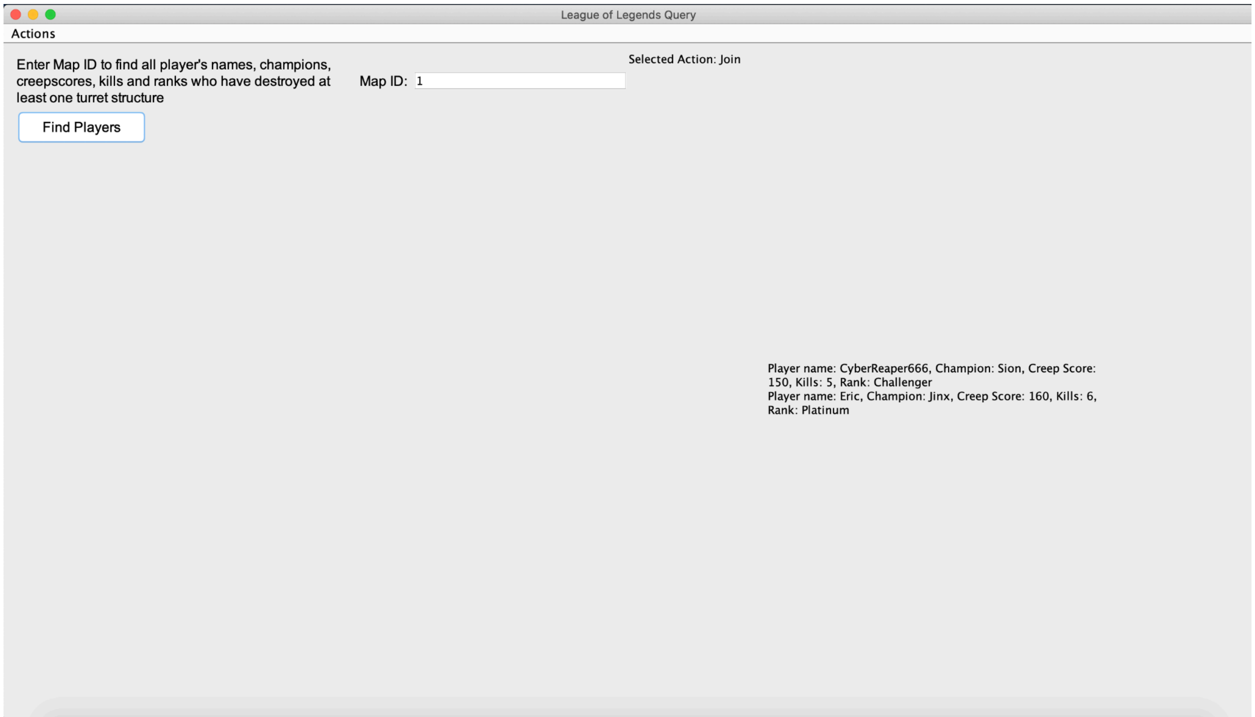
- GUI for projection on playerStats with playerID, playerName, champID, and mapID selected



playerID	playerName	champID	mapID
1	CyberReaper666	123	1
2	UREKA	234	1
3	tenko_dogfather	345	2
4	Eric	456	2
5	euoruph	567	3
6	testPlayer	1	1

- Result of the projection query in GUI

Join



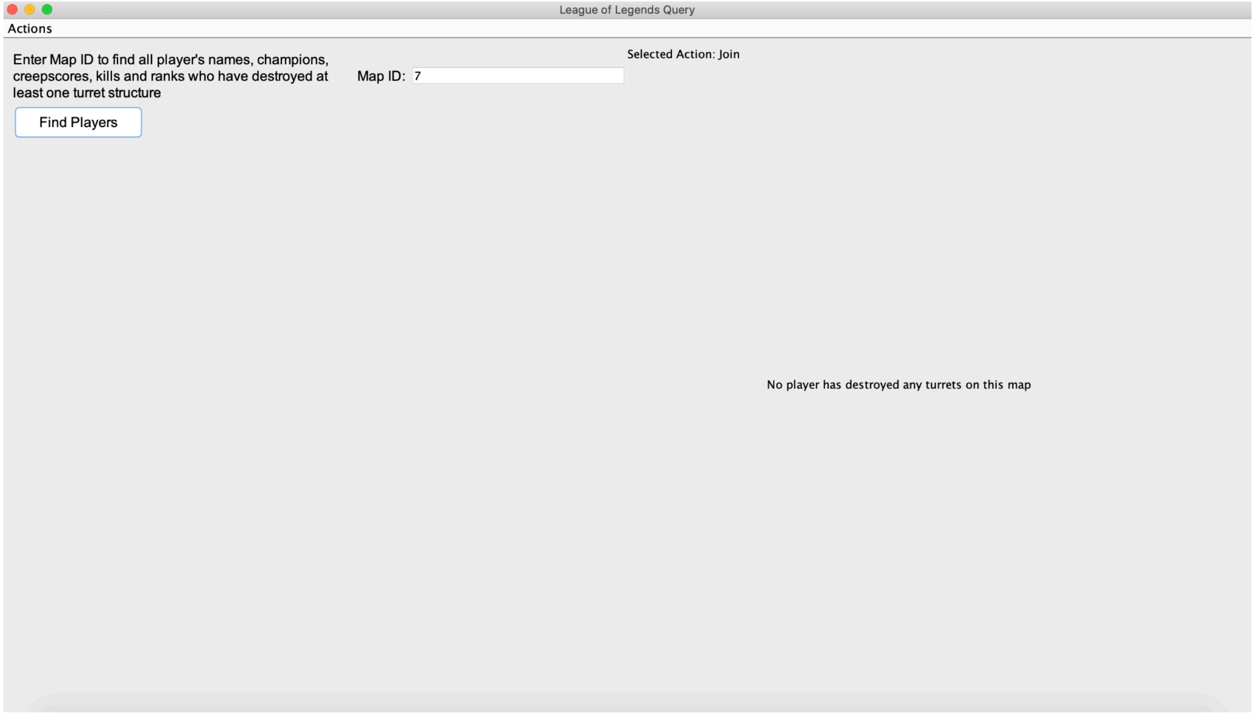
Enter Map ID to find all player's names, champions, creepscores, kills and ranks who have destroyed at least one turret structure

Map ID: 1

Selected Action: Join

Player name: CyberReaper666, Champion: Sion, Creep Score: 150, Kills: 5, Rank: Challenger
Player name: Eric, Champion: Jinx, Creep Score: 160, Kills: 6, Rank: Platinum

- GUI for join given a mapID



Enter Map ID to find all player's names, champions, creepscores, kills and ranks who have destroyed at least one turret structure

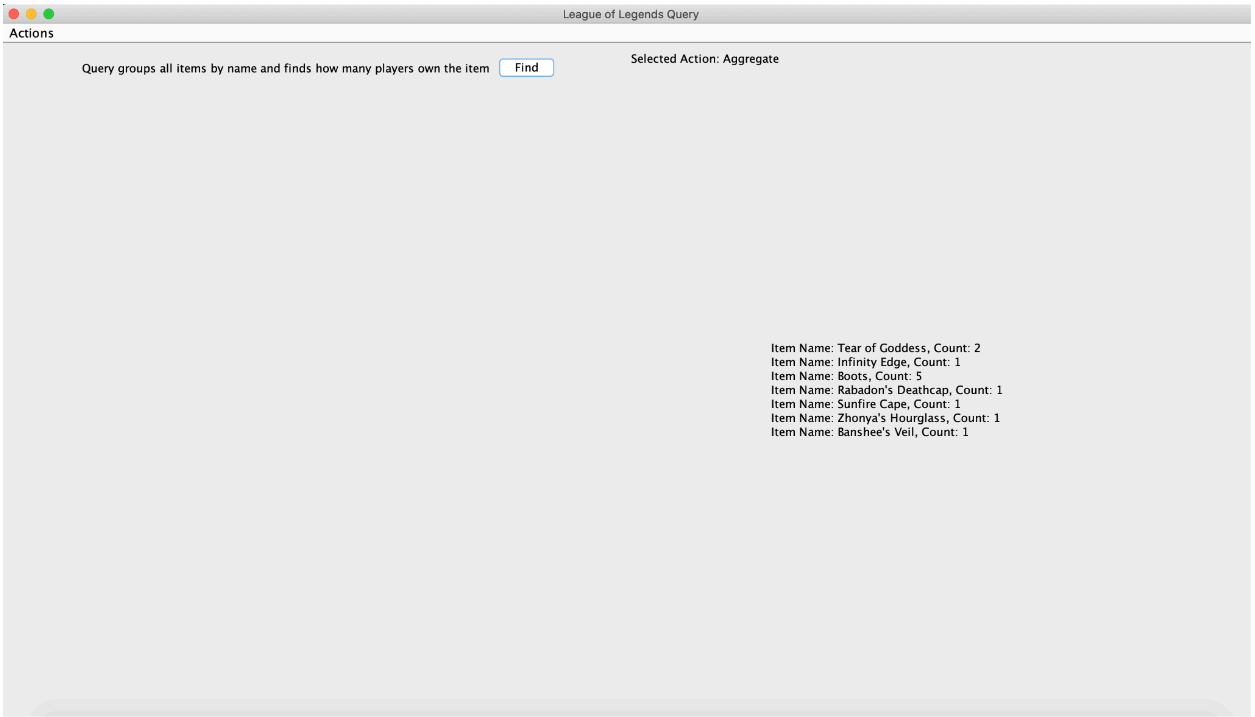
Map ID: 7

Selected Action: Join

No player has destroyed any turrets on this map

- Error message if the mapID doesn’t exist or there are no turrets destroyed on that mapID

Aggregation with Group By



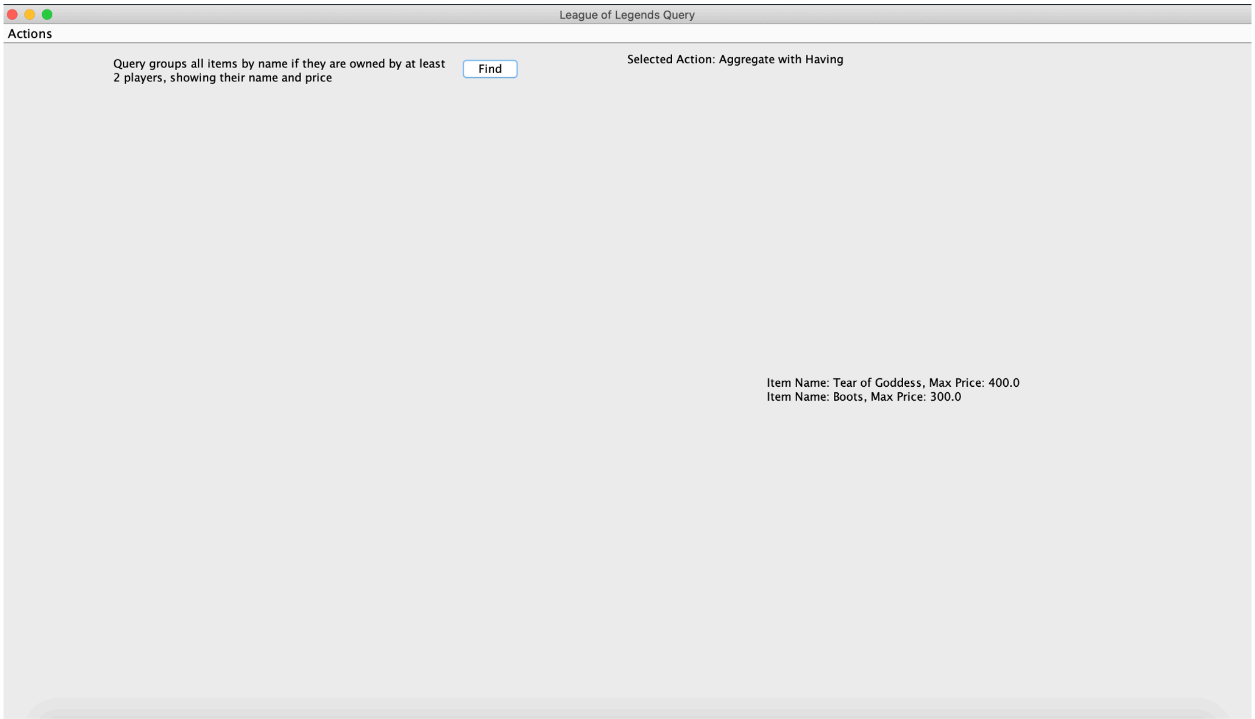
Query groups all items by name and finds how many players own the item

Selected Action: Aggregate

```
Item Name: Tear of Goddess, Count: 2
Item Name: Infinity Edge, Count: 1
Item Name: Boots, Count: 5
Item Name: Rabadon's Deathcap, Count: 1
Item Name: Sunfire Cape, Count: 1
Item Name: Zhonya's Hourglass, Count: 1
Item Name: Banshee's Veil, Count: 1
```

- GUI for aggregation with group by, grouping by itemName, then projecting Count(*)

Aggregation with Having



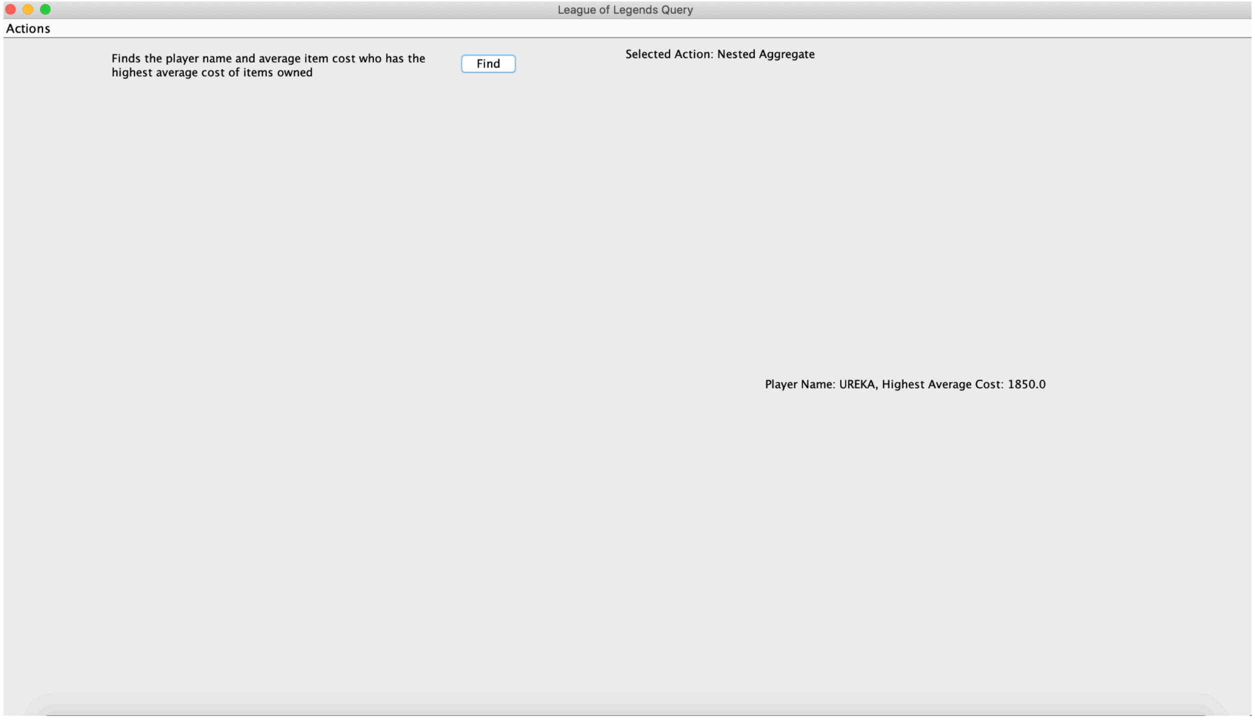
Query groups all items by name if they are owned by at least 2 players, showing their name and price

Selected Action: Aggregate with Having

```
Item Name: Tear of Goddess, Max Price: 400.0
Item Name: Boots, Max Price: 300.0
```

- GUI for aggregation with having, grouping by itemName, having Count(*) >= 2

Nested Aggregation with Group By



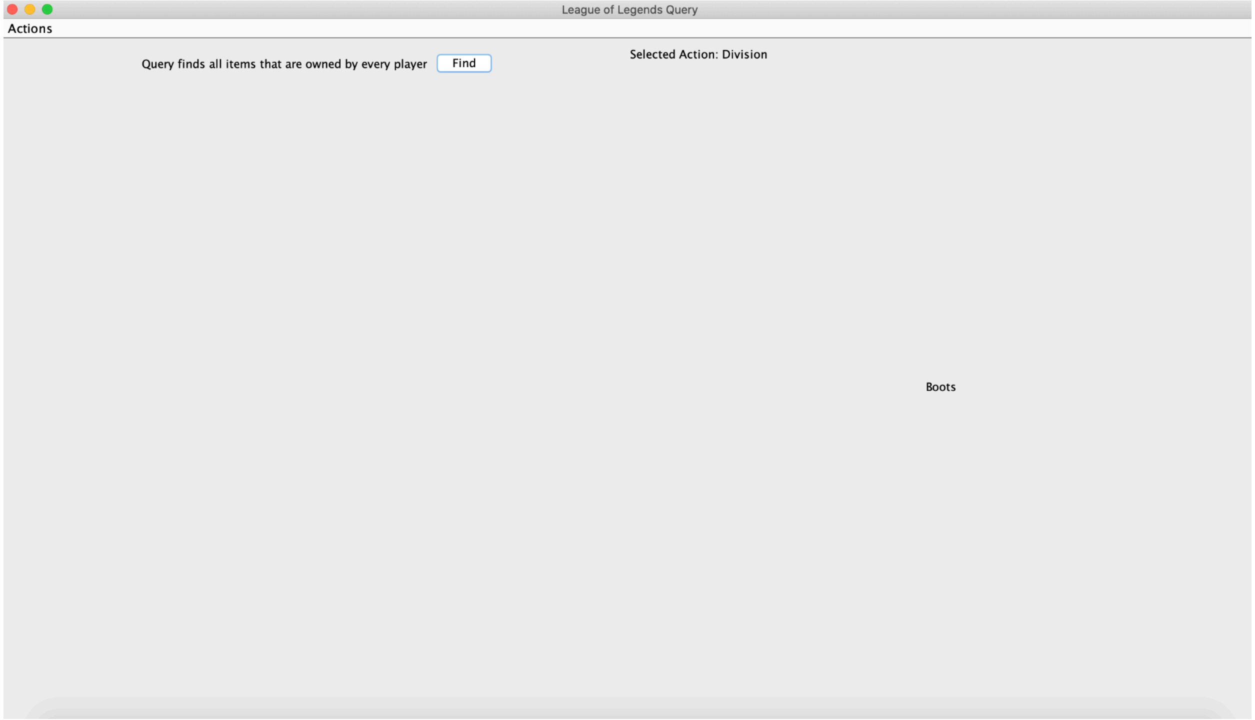
Finds the player name and average item cost who has the highest average cost of items owned

Selected Action: Nested Aggregate

Player Name: UREKA, Highest Average Cost: 1850.0

- GUI for nested aggregation with group by, grouping by playerName finding their avg cost of items, then projecting the playerName and the max average cost

Division



League of Legends Query

Actions

Query finds all items that are owned by every player

Find

Selected Action: Division

Boots

- GUI for division finding the itemName with every playerID