CPSC 304 Project Cover Page

Milestone #: 4

Date: April 5, 2024

Group Number: 25

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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

Final Project Description:

We created a database tool for an RPG game. Our approach is from the angle of the developers, and our queries can be used to make changes to players, objects, and NPCs in the game (such as adding a new player, updating the owner/status of a shop, and deleting NPCs). We also have several queries which are geared towards data collection, which can be used to improve player experience and as achievements (for example, our division query, which returns all players who have completed all quests under a certain level, might be used to create a "quest achievement").

Github Repository Link:
https://github.students.cs.ubc.ca/CPSC304-2023W-T2/project_b8o2g_l1i9d_w7o2b

SQL Database Script:
Our database setup file is "**databaseSetup.sql**"
It can be found at this location: **src/group.project/sql.scripts/databaseSetup.sql**

Schema Changes from Milestone 3

There were no major changes to any of the schema. We made slight changes to a few of the attributes based on TA recommendations from our previous meeting.

Project Schema

Server(sid, sname, region)
NPC(nid, nname)
Quest(qname, **giverid**, exp, minlevel, objectives)
Shop(shopid, **ownerid**, status)
Guild_2(rank, goldBonus)
Guild_3(gname, **rank**)
Inventory(invid, **pname**, **sid**, sz)
Item(iname, iid, **invid**, **questname**, value)
Potion_2(type, sz, effect)
Potion_3(**ptname**, **ptid**, **type**, **sz**, **shopid**, price)
Weapon_2(type, rarity, damage)
Weapon_3(**wname**, **wid**, **type**, **rarity**)
QuestItem(**qiname**, **qiid**, type, description)
Player_2(exp, lvl)
Player_4(**exp**, mana)
Player_6(**exp**, health)
Player_7(pname, **sid**, **wname**, **wid**, **exp**, **gname**, role)
Does(**qname**, **pname**, **sid**, progress)

Post-initialization screenshots

```
       SID SNAME
---------- ------------------------------------------------
REGION
------------------------------------------------
         1 ServerCA
Canada

         2 ServerUS
USA

         3 ServerSA
South America


       SID SNAME
---------- ------------------------------------------------
REGION
---------------------------------------------
         4 ServerAS
Asia

         5 ServerEU
Europe
```

Server

```
       NID NNAME
---------- ------------------------------------------------------
         1 Alice
         2 Bob
         3 Charles
         4 David
         5 Emily
         6 Frank
         7 John McTemporary
```

NPC

```
   SHOPID    OWNERID STATUS
---------- ---------- ---------------------------------------------------
         1          1 open
         2          2 open
         3          3 closed
         4          5 closed
         5          6 open
         6          7 open
```

Shop

```
QNAME                                             GIVERID        EXP
------------------------------------------------- ---------- ----------
   MINLEVEL OBJECTIVES
---------- -------------------------------------------------
Buy a Weapon                                           1        100
        1 Buy your first weapon

Buy a Potion                                           2        150
        5 Buy your first potion

Slay a Monster                                         3        500
        3 Defeat one slime


QNAME                                             GIVERID        EXP
------------------------------------------------- ---------- ----------
   MINLEVEL OBJECTIVES
---------- -------------------------------------------------
Join a Guild                                           4       1000
       10 Join the Beginners Guild

Deliver a Letter                                       5        300
        8 Deliver the letter to Bob
```

Quest

```
      RANK   GOLDBONUS
---------- ----------
         1        500
         2       1000
         3       1500
         4       2000
         5       2500
```

Guild_2

```
GNAME                                                  RANK
-------------------------------------------------- ----------
Beginner Guild                                         1
Intermediate Guild                                     2
Advanced Guild                                         3
Expert Guild                                           4
Pals for Life                                          5
Rivals for Life                                        5
Acquaintances for Life                                 5
Old Hunters                                            3
Byrgenwerth College                                    3
Healing Church                                         3
The Choir                                              3
```

Guild_3

```
INAME                                               IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                           VALUE
-------------------------------------------------- ----------
Wooden Sword                                            16          1
Buy a Weapon                                             5

Stone Hammer                                            17
                                                        10

Quality Bow                                            18
                                                       100


INAME                                               IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                           VALUE
-------------------------------------------------- ----------
Iron Sword                                             19
                                                     1000

Diamond Hammer                                        20          2
                                                    10000

iron ingot                                             1          1
                                                        5


INAME                                               IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                           VALUE
-------------------------------------------------- ----------
bronze ingot                                           2          1
                                                        3

tuna                                                   3          2
                                                        2

blue hat                                               4          1
                                                       10
```

Item, page 1

```
INAME                                              IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                          VALUE
-------------------------------------------------- ----------
dandelion                                                   5          1
                                                            1

Small Potion of Health                                      6          3
Deliver a Letter                                           10

Medium Potion of Speed                                      7          5
                                                           20


INAME                                              IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                          VALUE
-------------------------------------------------- ----------
Large Potion of Strength                                    8          1
                                                           30

Small Potion of Defense                                     9
                                                           10

Extra-Large Potion of Evasion                              10
                                                           40


INAME                                              IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                          VALUE
-------------------------------------------------- ----------
Steamy Love Letter                                         11
Deliver a Letter                                           -1

Boar Tusk                                                  12
Slay a Monster                                             -1

Poisoned Vial                                             13
Buy a Potion                                              -1
```

Item, page 2

```
INAME                                              IID        INVID
-------------------------------------------------- ---------- ----------
QUESTNAME                                          VALUE
-------------------------------------------------- ----------
Heroes Sword                                               14
Buy a Weapon                                              -1

Quil of Destiny                                            15
Join a Guild                                              -1
```

Item, page 3

```
TYPE
------------------------------------------------
RARITY                                              DAMAGE
------------------------------------------------ ----------
sword
common                                                   5

hammer
common                                                  10

bow
uncommon                                                15


TYPE
------------------------------------------------
RARITY                                              DAMAGE
------------------------------------------------ ----------
sword
rare                                                    25

hammer
legendary                                              100
```

Weapon_2

```
WNAME                                                 WID
------------------------------------------------ ----------
TYPE
------------------------------------------------
RARITY
------------------------------------------------
Wooden Sword                                           16
sword
common

Stone Hammer                                           17
hammer
common

WNAME                                                 WID
------------------------------------------------ ----------
TYPE
------------------------------------------------
RARITY
------------------------------------------------
Quality Bow                                            18
bow
uncommon

Iron Sword                                             19
sword

WNAME                                                 WID
------------------------------------------------ ----------
TYPE
------------------------------------------------
RARITY
------------------------------------------------
rare

Diamond Hammer                                         20
hammer
legendary
```

Weapon_3

```
TYPE
------------------------------------------------
SZ
------------------------------------------------
EFFECT
------------------------------------------------
health
small
+10 health

speed
medium
+20 speed

TYPE
------------------------------------------------
SZ
------------------------------------------------
EFFECT
------------------------------------------------

strength
large
+50 strength

defense
small

TYPE
------------------------------------------------
SZ
------------------------------------------------
EFFECT
------------------------------------------------
+10 defense

evasion
extra-large
+75 evasion
```

Potion_2

```
PTNAME                                              PTID
--------------------------------------------------- ----------
TYPE
-----------------------------------------------
SZ                                                  SHOPID     PRICE
--------------------------------------------------- ---------- ----------
Small Potion of Health                                 6
health
small                                                  1          50

Medium Potion of Speed                                 7
speed
medium                                                 1          75

PTNAME                                              PTID
--------------------------------------------------- ----------
TYPE
-----------------------------------------------
SZ                                                  SHOPID     PRICE
--------------------------------------------------- ---------- ----------

Large Potion of Strength                               8
strength
large                                                  1         100

Small Potion of Defense                                9
defense

PTNAME                                              PTID
--------------------------------------------------- ----------
TYPE
-----------------------------------------------
SZ                                                  SHOPID     PRICE
--------------------------------------------------- ---------- ----------
small                                                  1          50

Extra-Large Potion of Evasion                         10
evasion
extra-large                                            1         125
```

Potion_3

```
    EXP          LVL
---------    ---------
      100            1
      500            3
     1000            7
    10000           20
   100000           50
```

Player_2

```
    EXP        MANA
---------- ----------
       100         50
       500        100
      1000        200
     10000        500
    100000        800
```

Player_4

```
    EXP       HEALTH
---------- ----------
       100         50
       500         90
      1000        180
     10000        400
    100000        750
```

Player_6

```
PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
----------------------------------------------
ROLE
----------------------------------------------
Player1                                            1
                                                              100




PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
----------------------------------------------
ROLE
----------------------------------------------
Leeroy Jenkins                                     1
Diamond Hammer                                     20         500
Pals for Life
officer


PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
----------------------------------------------
ROLE
----------------------------------------------
Chuck E. Cheese                                    2
                                                              1000

Beginner Guild
recruit
```

Player_7, page 1

```
PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
----------------------------------------------
ROLE
----------------------------------------------
Homer Simpsonn                                     3
Wooden Sword                                       16         100000
Beginner Guild
captain


PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
----------------------------------------------
ROLE
----------------------------------------------
GandalfTheCool                                     5
Iron Sword                                         19         100000
Advanced Guild
3
```

Player_7, page 2

```
    INVID PNAME                                            SID
---------- -------------------------------------------------- ----------
        SZ
----------
         1 Player1                                             1
        10

         2 Leeroy Jenkins                                      1
        20

         3 Chuck E. Cheese                                     2
        25


    INVID PNAME                                            SID
---------- -------------------------------------------------- ----------
        SZ
----------
         4 Homer Simpsonn                                      3
        30

         5 GandalfTheCool                                      5
        50
```

Inventory

```
QNAME
----------------------------------------------
PNAME                                                SID    PROGRESS
-------------------------------------------------- ---------- ----------
Buy a Weapon
Player1                                               1        100

Slay a Monster
Player1                                               1        100

Deliver a Letter
Player1                                               1        100


QNAME
----------------------------------------------
PNAME                                                SID    PROGRESS
-------------------------------------------------- ---------- ----------
Buy a Potion
Player1                                               1        100

Slay a Monster
Leeroy Jenkins                                        1        100

Buy a Weapon
Leeroy Jenkins                                        1        100


QNAME
----------------------------------------------
PNAME                                                SID    PROGRESS
-------------------------------------------------- ---------- ----------
Deliver a Letter
Leeroy Jenkins                                        1        100

Buy a Potion
Leeroy Jenkins                                        1        100

Join a Guild
Leeroy Jenkins                                        1        100
```

Does, page 1

```
QNAME
-------------------------------------------------
PNAME                                             SID   PROGRESS
------------------------------------------------- ----- ---------
Buy a Weapon
Chuck E. Cheese                                     2         100

Deliver a Letter
Chuck E. Cheese                                     2          90

Buy a Potion
Homer Simpsonn                                      3          80
```

Does, page 2

List of All SQL Queries and where it can be found in the code
NOTE: All queries can be found in: src/group.project/database/DatabaseConnectionHandler

1. **Insert**
   Insert Player adds a new player to the database. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 45.

2. **Delete**
   Delete NPC removes NPC(s) from the database. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 231.

3. **Update**
   Update the owner or status of a NPC shop. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 163.

4. **Selection**
   Selects quests based on filters that are provided in a dropdown. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler.java at line 369.

5. **Projection**
   Select Attributes from Table allows the user to view attributes in a table. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 524.

6. **Join**
   Selects all items in a specified inventory with values greater than a given variable. Its SQL can be found in DatabaseConnectionHandler at line 394.

7. **Aggregation with Group By**
   Gets the total monetary value of all items in a specified inventory. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 333.

8. **Aggregation with Having**
   Gets the guild ranks with the most guilds at that rank. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 314.

9. **Nested Aggregation with Group By**
   Gets the average player level in a specified guild. Its SQL can be found in src/group.project/database/DatabaseConnectionHandler at line 563.

10. Division
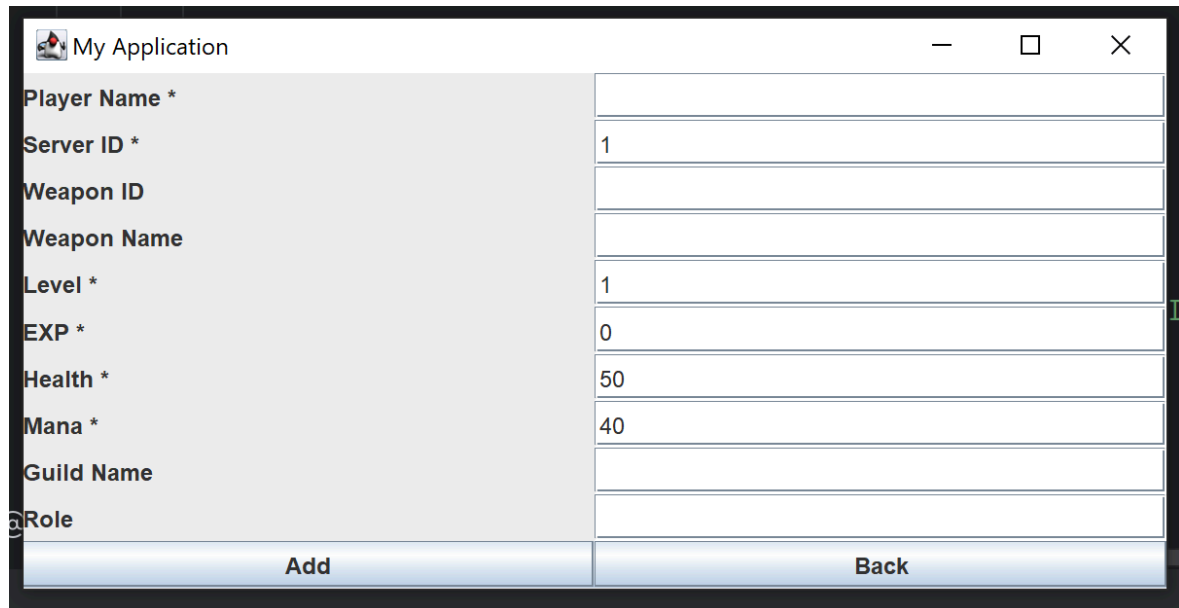
Division retrieves all players who have completed all quests under a user specified level. Its SQL can be found in DatabaseConnectionHandler at line 287.

SQL Queries Screenshots
NOTE: includes query result screenshots at end of each query
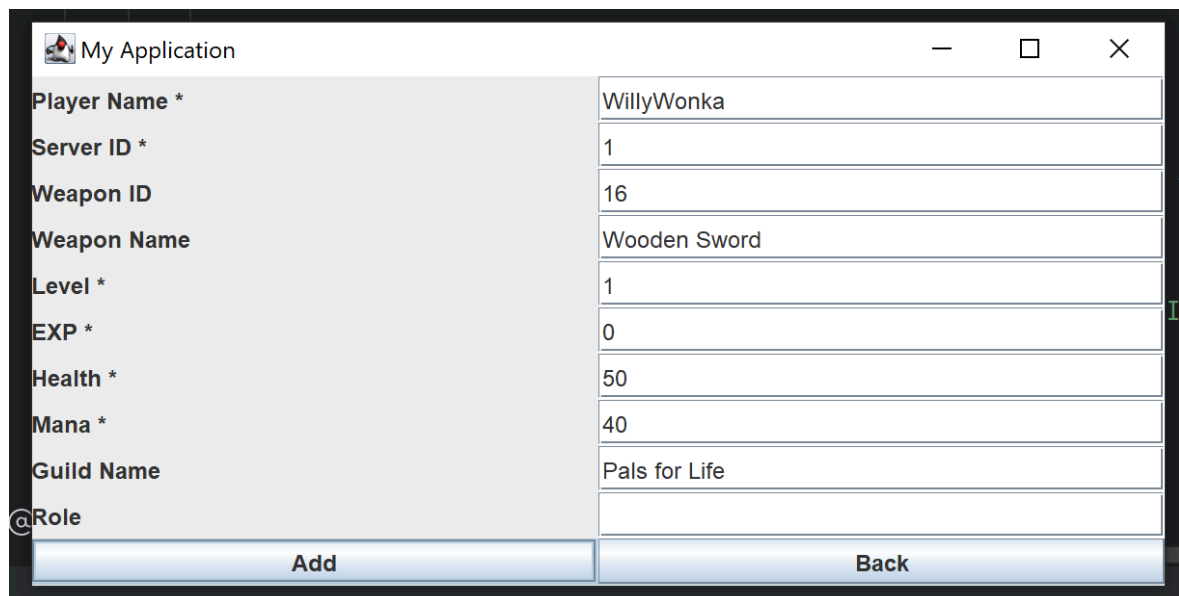
1. Insert
This query changes data in the database.

This is our InsertPanel! Here we can add a new player to the database. Let's start by filling in the fields. Some of the fields have default values placed in them (for a level 1 player), but we can change these if we'd like. An asterisk (*) indicates a mandatory field.

Now that we've filled in our data, we can try to add the player. If we've missed any

required fields, we'll get an error. Otherwise, we'll get a notification that the player was successfully added.

Now that our player's been added, we can go to the SELECTION Panel and run a query to see our new player in the database!

PNAME	SID	WNAME	WID	EXP	GNAME	ROLE
WillyWonka	1	Wooden Sw...	16	0	Pals for Life	Null
Player1	1	Null	Null	100	Null	Null
Leeroy Jenkins	1	Diamond Ha...	20	500	Pals for Life	officer
Chuck E. Ch...	2	Null	Null	1000	Beginner Guild	recruit
Homer Simp...	3	Wooden Sw...	16	100000	Beginner Guild	captain
GandalfThe...	5	Iron Sword	19	100000	Advanced G...	3
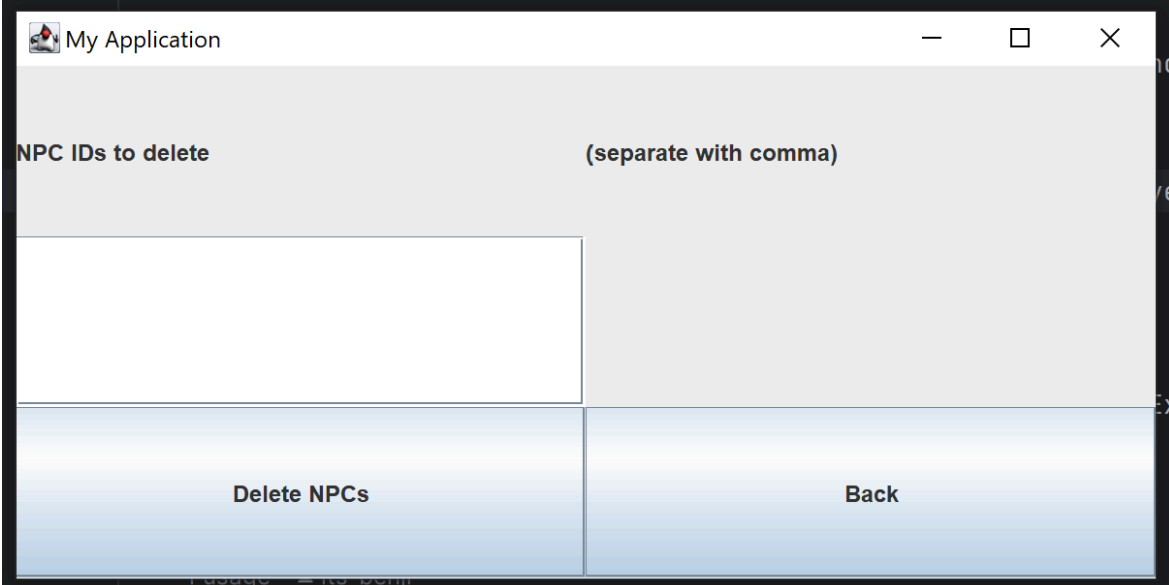
Great! Note that (as seen in ROLE) any unfilled columns will be assigned the value NULL.

2. Delete

This query changes data in the database.

This is our Delete panel, which can be used to delete NPCs from our database. Before we do any deletions, let's take a look at the NPCs we currently have in the system.

NID	NNAME
1	Alice
2	Bob
3	Charles
4	David
5	Emily
6	Frank
7	John McTemporary

OK

There's currently 7 NPCs with IDs 1 to 7. Next, let's delete NPCs 1, 3, and 6.

My Application ─ □ ✕

NPC IDs to delete (separate with comma)

1,3,6

Delete NPCs **Back**

Then we hit "Delete NPCs."

My Application

NPC IDs to delete   **(separate with comma)**

Message ✕

ⓘ **Success!**

OK

1,3,6

Delete NPCs   **Back**
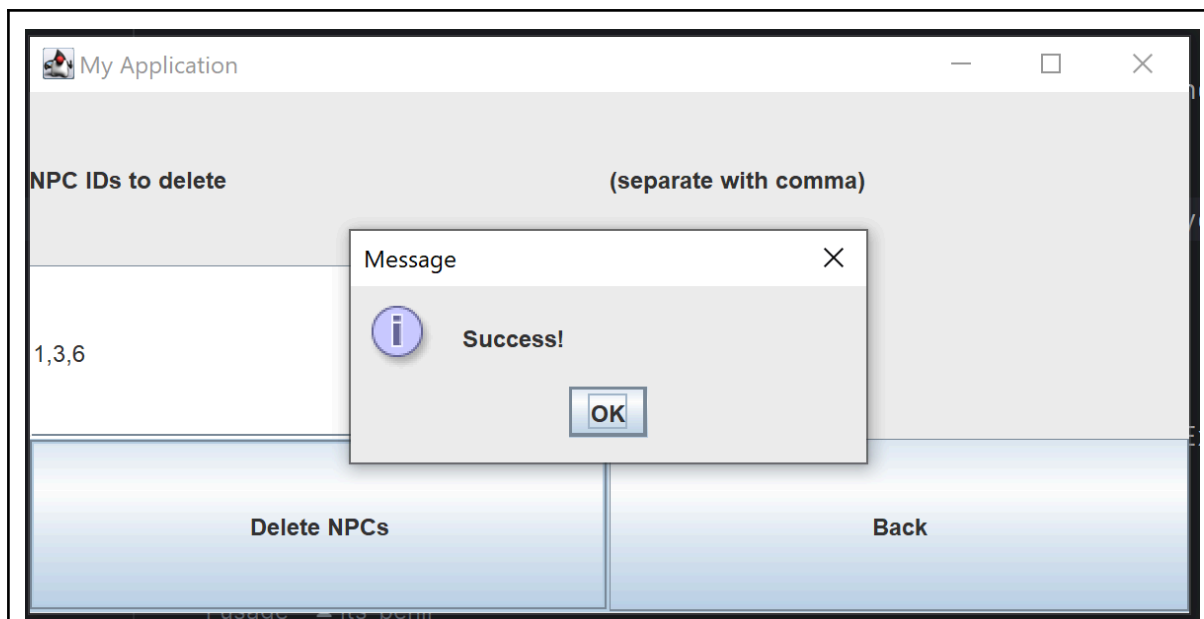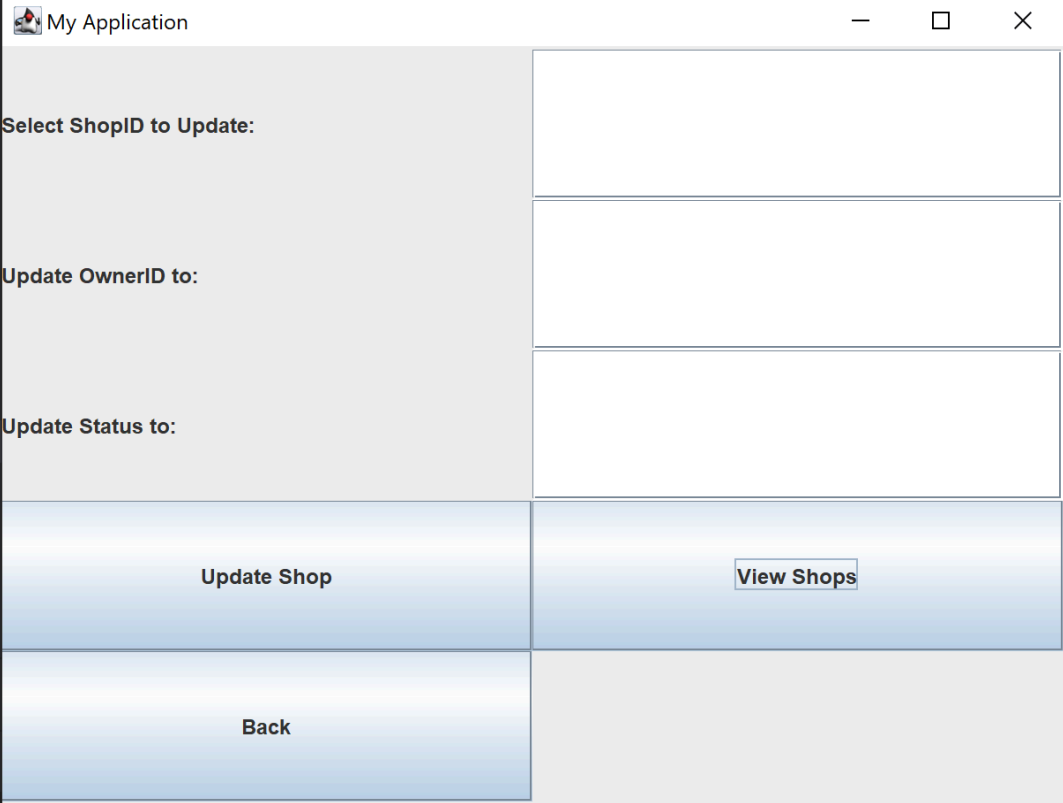
Now let's check the NPCs we have in the system to see if they were successfully deleted.

Selected Attributes ✕

NID	NNAME
2	Bob
4	David
5	Emily
7	John McTemporary

OK
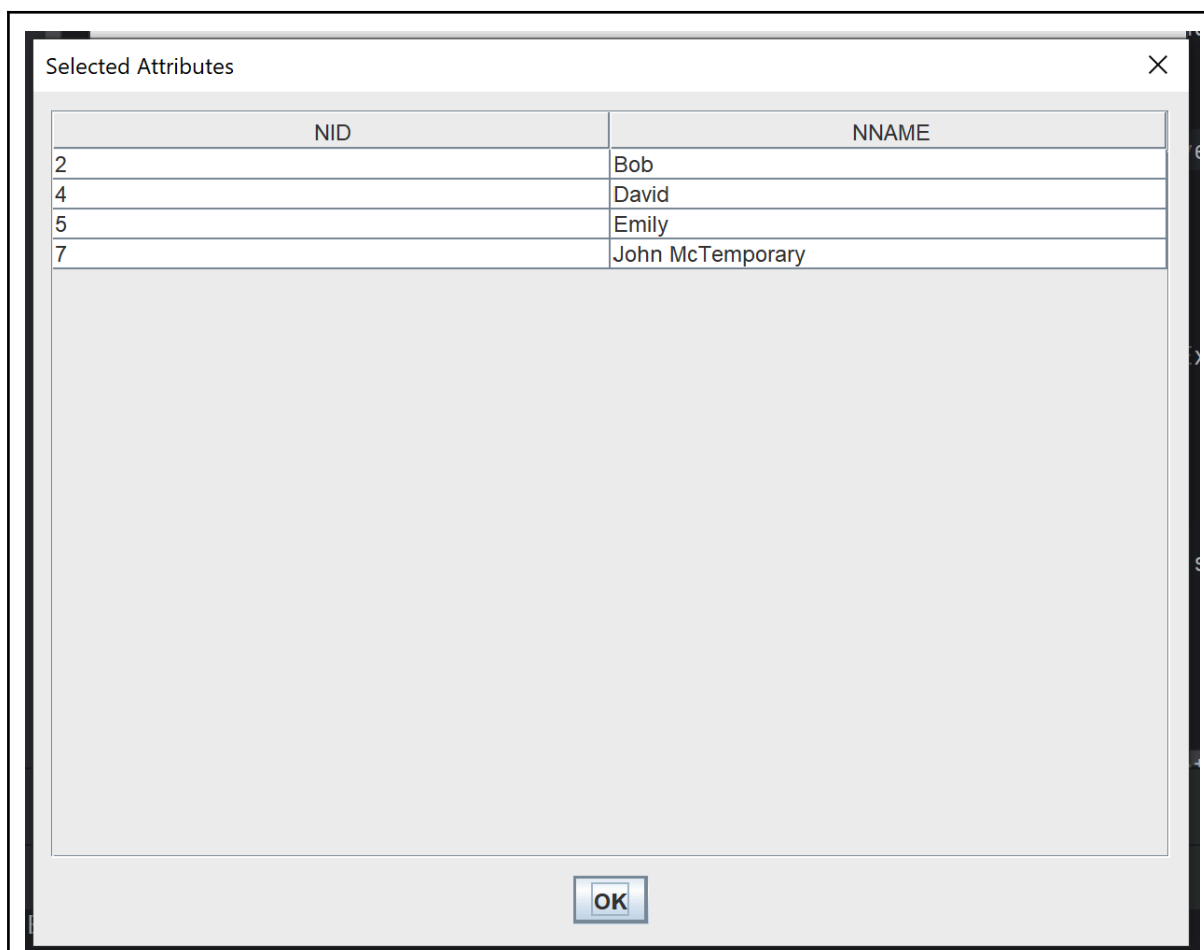
Great! It looks like 1, 3, and 6 were successfully deleted!

3. Update
This query changes data in the database.
This is our Update Panel! Let's start by clicking on "View Shops" to see our current Shops

My Application

Select ShopID to Update:

Update OwnerID to:

Update Status to:

Owner ID	Shop ID	Status
1	1	open
2	2	open
3	3	closed
5	4	closed
6	5	open
7	6	open

Shop Information

Update Shop

Back

OK

```
entory
FROM user_tables
```
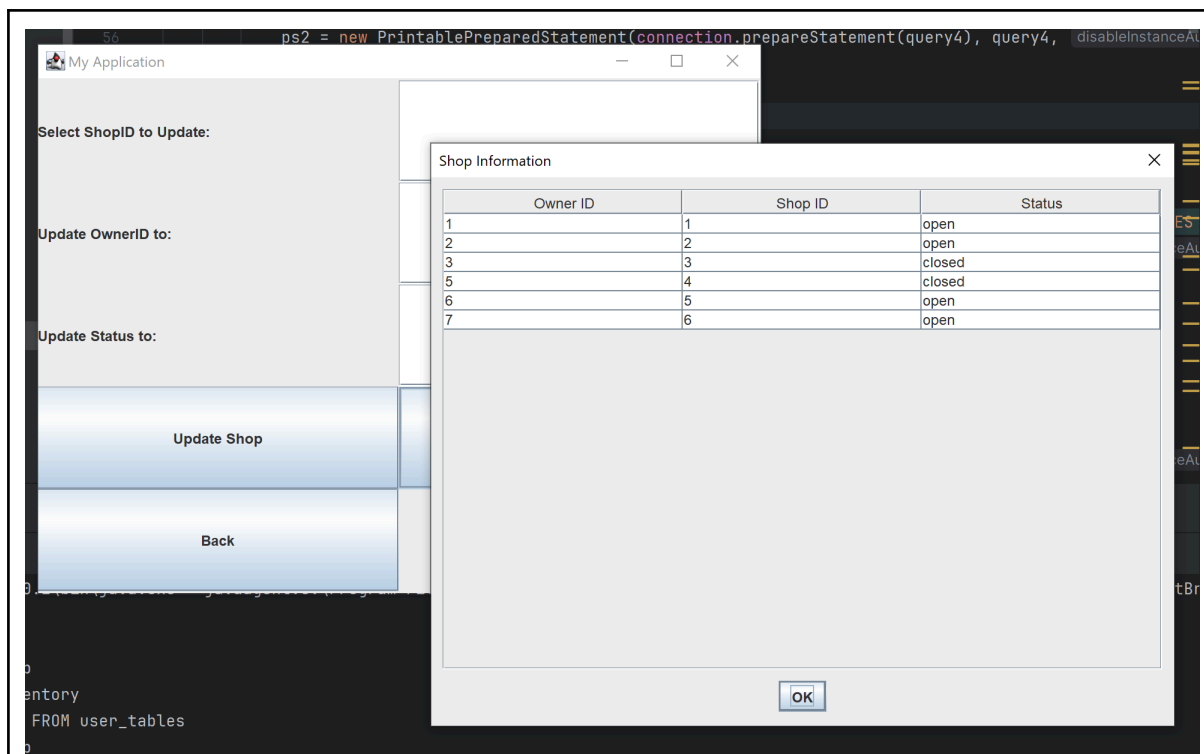
Currently the first row has Owner ID: 1, Shop ID: 1, Status: open. However, let's say that Shop ID: 1 has a new owner: Owner ID: 4, and the shop will be temporarily closed for updates. We can update this back in the main panel.

My Application

Select ShopID to Update: 1

Update OwnerID to: 4

Update Status to: closed

Update Shop	View Shops

| Back | |
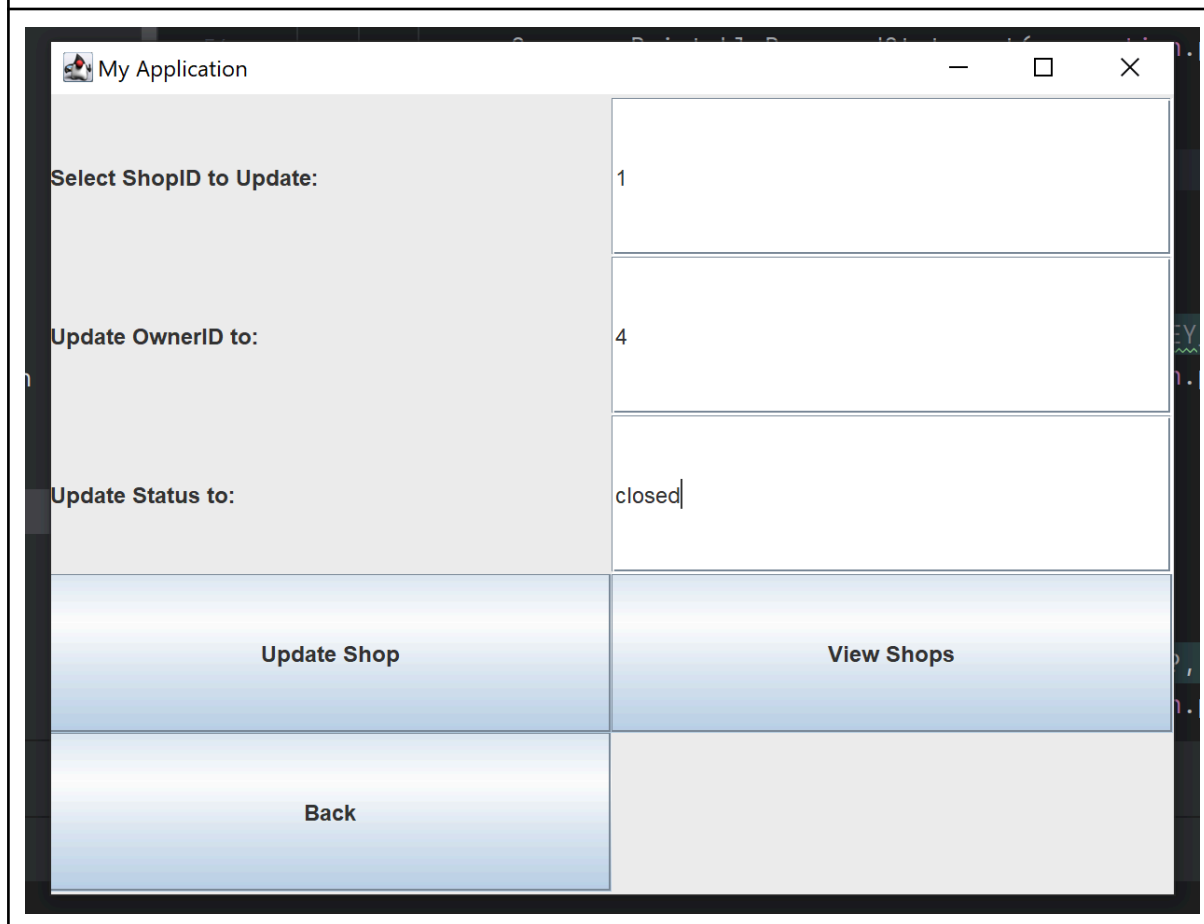
Once we've added in the details, we click "Update Shop" to update the database.

If successful, we'll get a "Success!" notification (if not, we'll get an error notification). Once this is done, we can check "View Shops" to see the new changes!
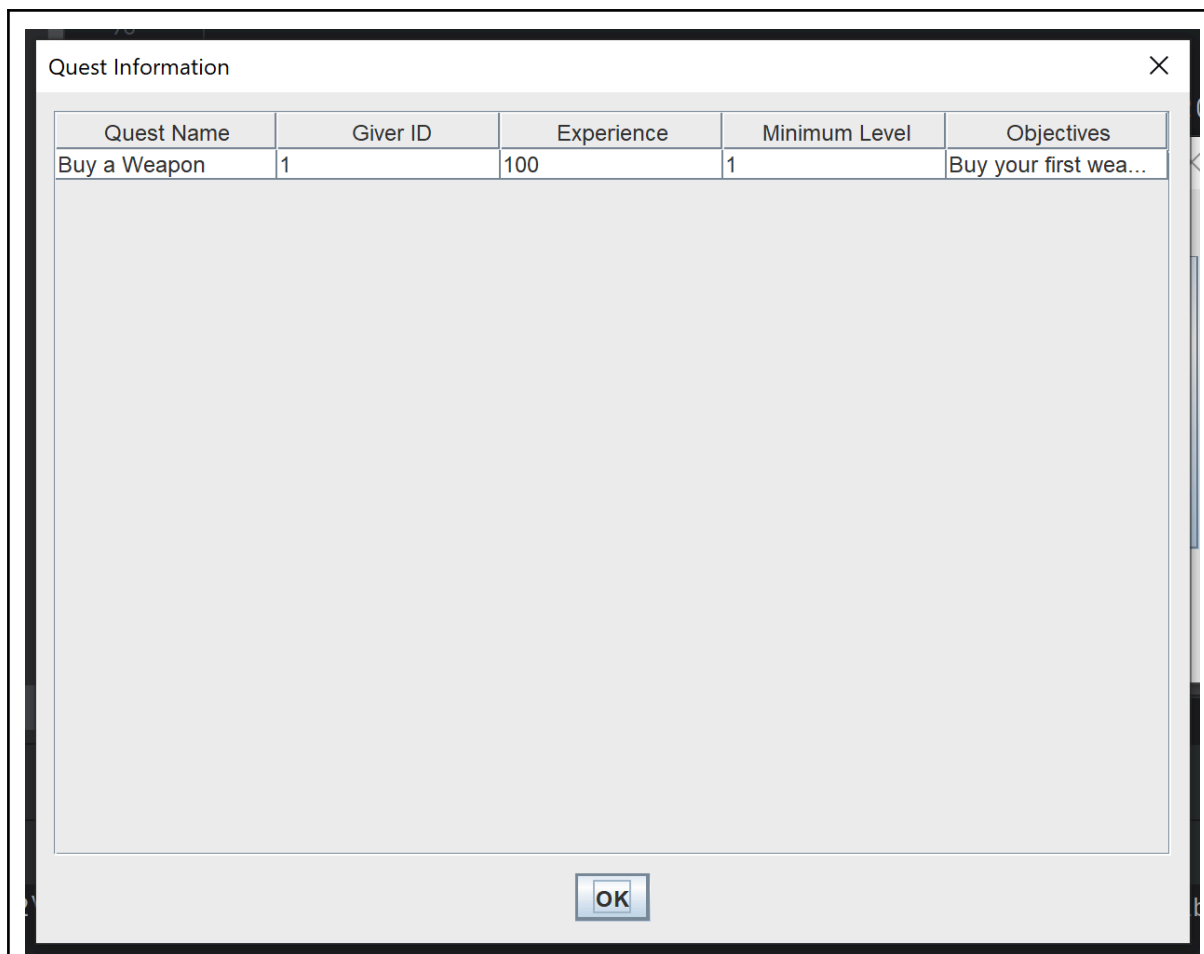
Shop Information

Owner ID	Shop ID	Status
4	1	closed
2	2	open
3	3	closed
5	4	closed
6	5	open
7	6	open

OK

As we can see in row 1, the Owner ID of Shop ID 1 has been changed to "4," and the status has been updated to "closed."

4. Select

This query doesn't change data in the database.
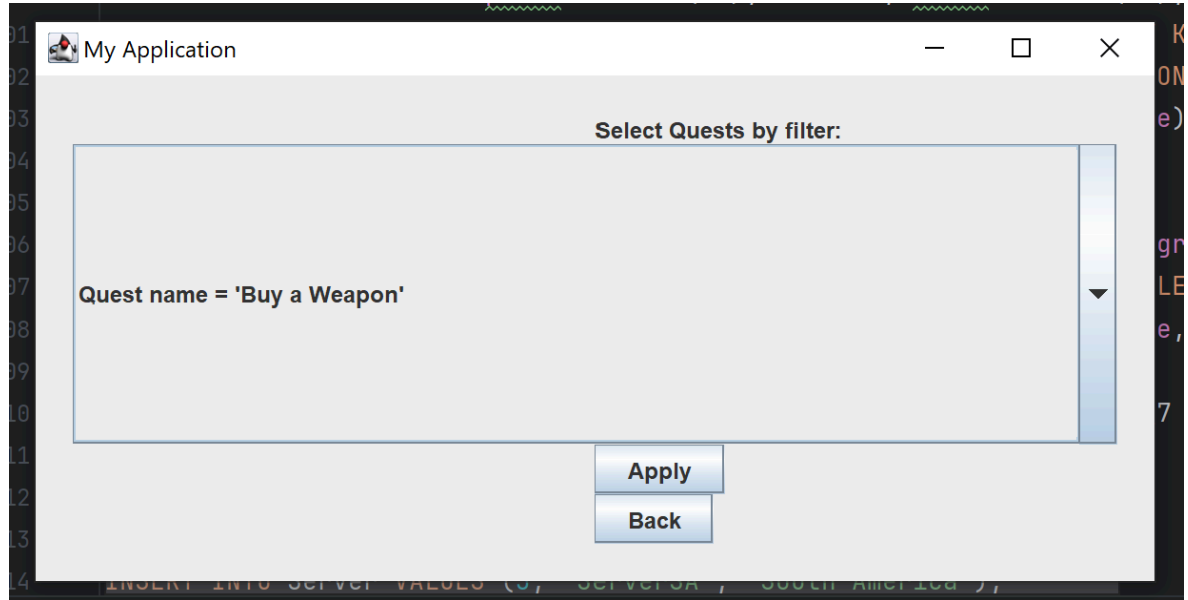
This is our Select Panel! This is the default view. If we'd like to see the results for the pictured query, we can press "Apply."
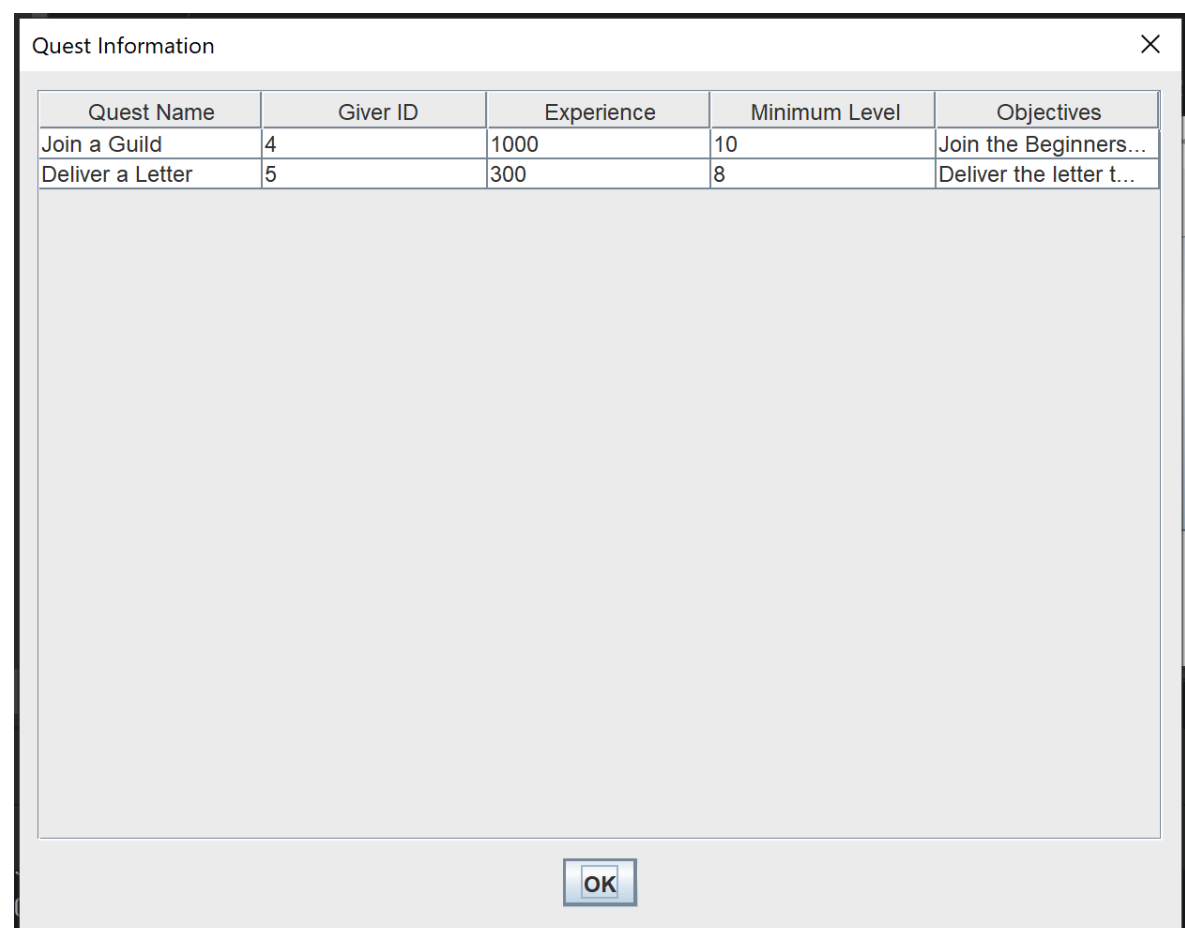
Quest Information

Quest Name	Giver ID	Experience	Minimum Level	Objectives
Buy a Weapon	1	100	1	Buy your first wea...

OK

After viewing the query, we can return to the main panel by pressing "OK." Then, to do a different Select query, we can press the dropdown arrow on the right of the query.

My Application

Select Quests by filter:

Quest name = 'Buy a Weapon'

Quest name = 'Buy a Weapon'
Min level >= 5
Exp > 200
Quest name = 'Buy a Weapon' or 'Buy a Potion'
Min level >= 5 and Exp > 200
Min level >= 5 or Exp > 200

Let's select "Min level >=5 and Exp > 200."

My Application

Select Quests by filter:

Min level >= 5 and Exp > 200

Apply

Back

Once again, we can click "Apply" to view the resulting Select query.

Quest Information

Quest Name	Giver ID	Experience	Minimum Level	Objectives
Join a Guild	4	1000	10	Join the Beginners...
Deliver a Letter	5	300	8	Deliver the letter t...

OK

The process is the same for all the other queries in Select!

5. Projection
This query does not change data in the database.

My Application

Choose desired table

NPC

Get Attributes

Back

Choose attributes from table: NPC

NID
NNAME

Submit

The user selects the desired table from the dropdown at the top of the screen. All tables in the database are available to choose from. Pressing 'Get Attributes' refreshes the combo-box below with all of the table's attributes. The user then selects one or more attributes from the combo-box, and presses 'Submit' to get the values.

Selected Attributes

NNAME
Alice
Bob
Charles
David
Emily
Frank
John McTemporary

OK

For example, this is the result of retrieving the attribute 'nname' from the table 'NPC'.
These are the names of all NPCs in the database.

6. Join

This query does not change data in the database.

My Application

Inventory to search (by ID)

1

Return all items with value greater than

5

Get All Items

Back

The user enters the inventory ID to search in the top text field, then the minimum item value in the bottom text field. Clicking 'Get All Items' will retrieve info on all items in the specified inventory where the item value is greater than the minimum value.

Item Information

Item ID	Item Name	Inventory ID	Quest Name	Value
4	blue hat	1		10
8	Large Potion of St...	1		30

OK

This is the result of finding all items in inventory ID 1 with value greater than 5. There are two such items, with values 10 and 30 respectively.

7. Aggregation with Group By

This query does not change data in the database.

My Application

Get Inventory total value

Inventory ID: 1

Apply

Back

The user can click on 'Apply' to retrieve, for the inventory with the ID specified, the sum of values of all items in that inventory.

For example, the inventory with ID 1 has items within it whose values sum to 54.

8. Aggregation with Group By / Having

This query does not change data in the database.

```
GNAME                                              RANK
-------------------------------------------------- ----------
Beginner Guild                                     1
Intermediate Guild                                 2
Advanced Guild                                     3
Expert Guild                                       4
Pals for Life                                      5
Rivals for Life                                    5
Acquaintances for Life                             5
Old Hunters                                        3
Byrgenwerth College                                3
Healing Church                                     3
The Choir                                          3
```

This is the relevant data that exists in our database when applying this query.

| Get ranks with most guilds | Back |

The user can click 'Get ranks with most guilds' to find the guild ranks with the most guilds at that rank.

Message

The ranks with most guilds are: Rank 3

OK

The rank with the most guilds currently is rank 3, which matches the data in our database. There are 5 guilds at rank 3, as opposed to 3 guilds at rank 5 and 1 guild at ranks 1, 2, and 4.

Nested Aggregation with Group By

This query does not change data in the database.

```
PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
--------------------------------------------------
ROLE
--------------------------------------------------
Player1                                              1
                                                                100




PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
--------------------------------------------------
ROLE
--------------------------------------------------
Leeroy Jenkins                                       1
Diamond Hammer                                       20         500
Pals for Life
officer


PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
--------------------------------------------------
ROLE
--------------------------------------------------
Chuck E. Cheese                                      2
                                                                1000
Beginner Guild
recruit
```

```
PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
--------------------------------------------------
ROLE
--------------------------------------------------
Homer Simpsonn                                         3
Wooden Sword                                          16     100000
Beginner Guild
captain


PNAME                                              SID
-------------------------------------------------- ----------
WNAME                                              WID        EXP
-------------------------------------------------- ---------- ----------
GNAME
--------------------------------------------------
ROLE
--------------------------------------------------
GandalfTheCool                                         5
Iron Sword                                            19     100000
Advanced Guild
3
```

```
      EXP           LVL
 ---------     ---------
      100             1
      500             3
     1000             7
    10000            20
   100000            50
```

This is the relevant existing data for Players, their levels, and the Guilds that they are in.

My Application

Apply   Back

The user can click on 'Apply' to retrieve, for each guild that has players in it, the average level of all players in that guild.

Quest Information

Guild Name	Average Player Level
Pals for Life	3.00
Advanced Guild	50.00
Beginner Guild	28.50

OK

We can see that the Beginner Guild has an average player level of 28.5, the Advanced Guild has an average player level of 50, and Pals for Life has an average player level of 3, which matches the data in our database.

10. Division
This query does not change data in the database.
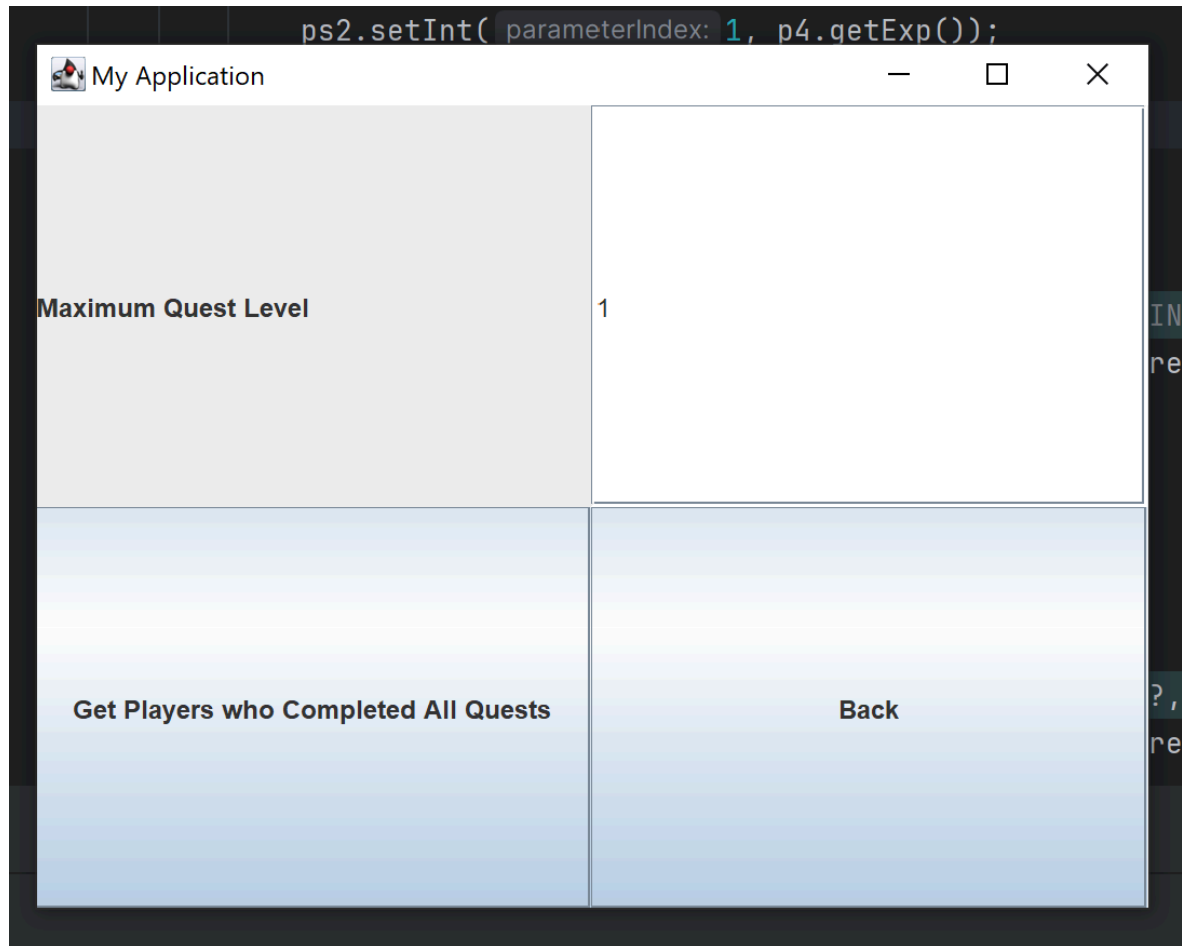
This is our Division Panel! Let's start by checking for all players who have completed all level 1 quests (or below). We put "1" into the textbox, and click "Get Players Who Completed All Quests."

My Application — □ ✕

Item Information ✕

Player Name	Quests Completed where level <= 1
Player1	1
Chuck E. Cheese	1
Leeroy Jenkins	1

Maximum

Get Pl

a.exe "

OK

It looks like there are currently 3 players who have completed all level 1 quests. Now let's check to see how many players have completed all level 10 quests or below.

My Application — □ ✕

Maximum Quest Level	10
Get Players who Completed All Quests	Back

Once we've added in the value, we press "Get Players Who Completed All Quests."

Item Information   ✕

Player Name	Quests Completed where level <= 10
Leeroy Jenkins	5

[OK]

It looks like only one player has currently completed all quests at or below level 10.

README:

A README.txt file was included in our repository. Since we have no extra information, it simply states "No Extra Information."