

RPG AR Mobile Game

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3/18/2022

Milestone 2

Introduction

An RPG is a Role Playing Game, in which a player goes on quests alone or with others using powers, weapons, and items. Players can buy and sell items, travel to locations, and slay enemies. Our database will model an RPG with various constraints and entities.

ER Diagram

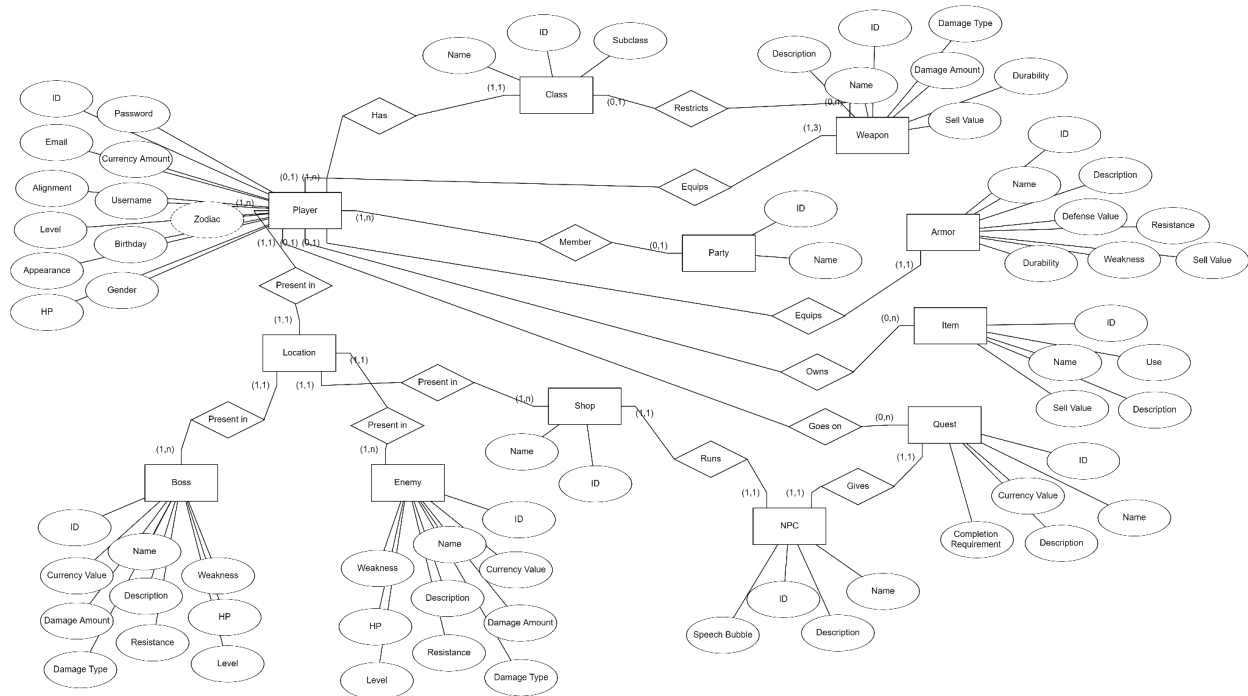
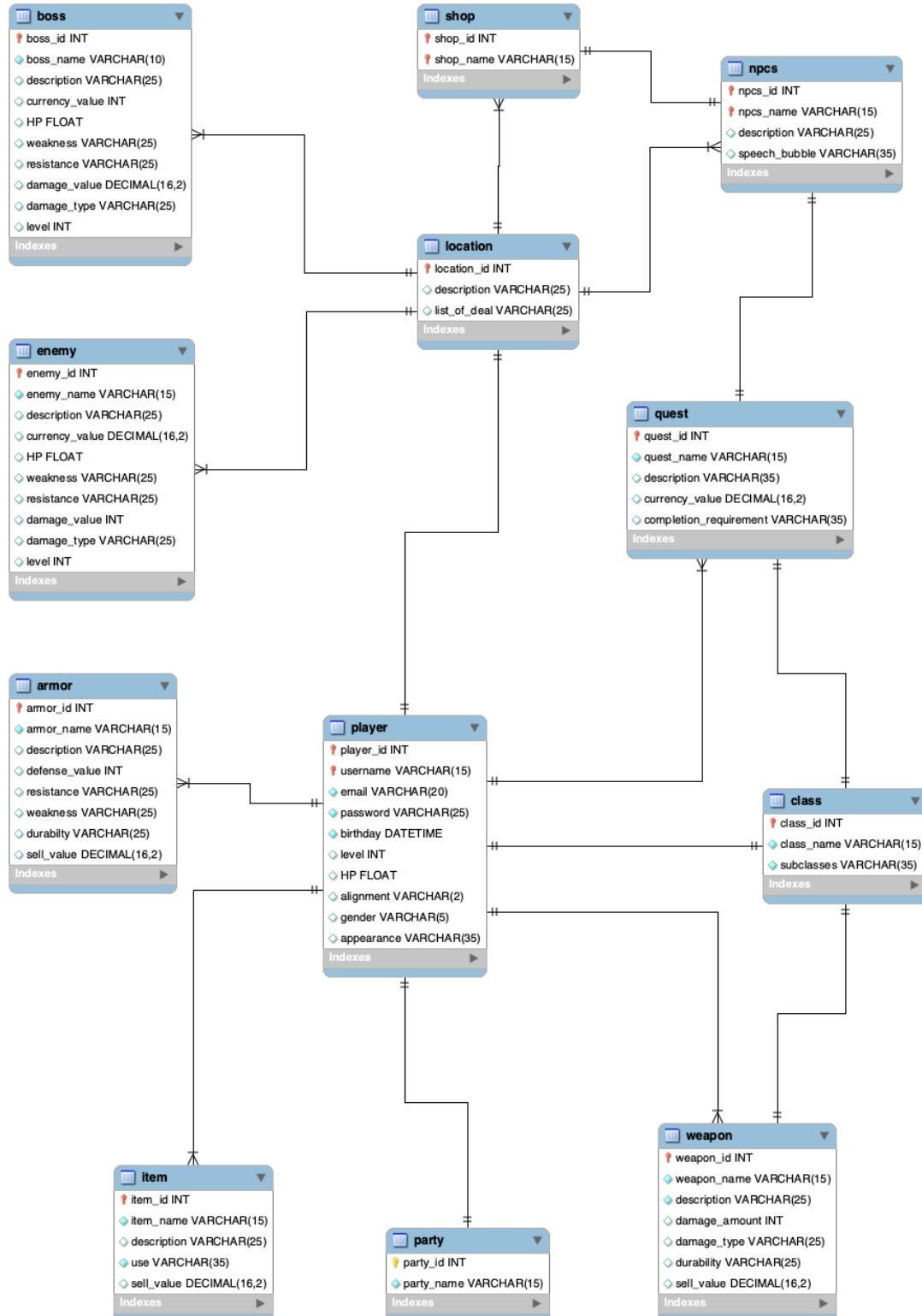


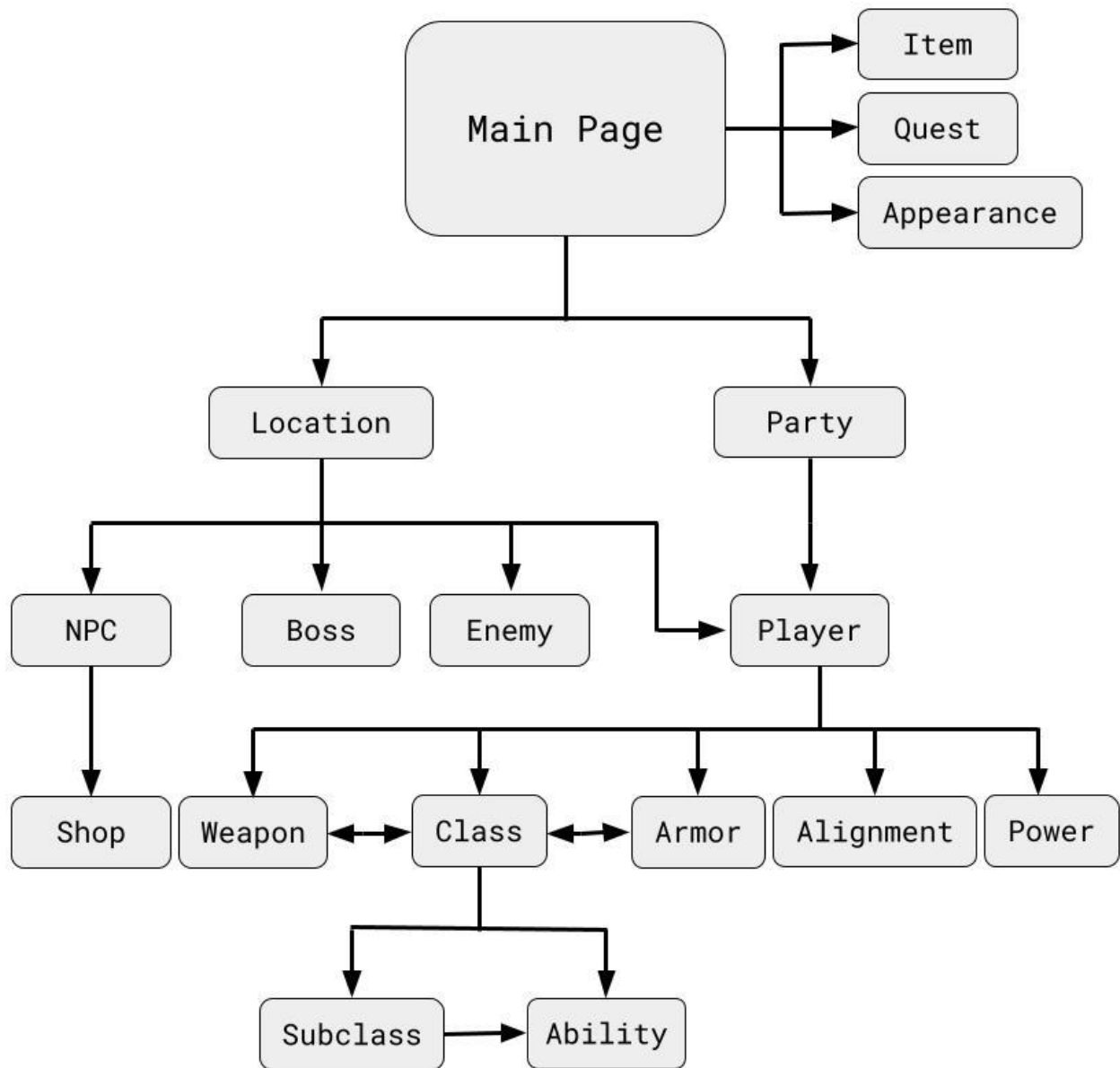
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Schema



Site Diagram



Constraints

Player Constraints:

- Player must be part of a Class that must have a record in the Class Table.
- Player can equip 1 set of Armor that must have a record in the Armor Table.
- Player can equip up to 3 Weapons that must have records in the Weapon Table.
- Player must be in 1 Location at any given time that must have a record in the Location Table.
- Player does not need to have Items, but if they do, the Items must be present in the Item Table.
- Player does not need to have accepted Quests, but if they do, the Quests must be present in the Quest Table.
- Player username cannot be more than 50 characters.
- Player password must be between 8 and 20 characters.
- Player password cannot be Null.
- Player's birthday must be after December 31st 1899.
- Player level cannot be Null.
- Player level must be ≥ 1 and ≤ 100 .
- Player HP cannot be Null.
- Player Alignment must have a record in the AlignmentType table.
- Player Gender must have a record in the GenderType table.
- Player's Appearance must have a record in the Appearance table.
- Player's Power must have a record in the PowerType table.

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- AlignmentType must either be Light or Dark.
 - GenderType name must be unique.
 - GenderType name cannot be Null.
 - GenderType name cannot be more than 50 characters.

Appearance Constraints:

- Appearance's Head must have a record in the HeadType table.
- Appearance's Torso must have a record in the TorsoType table.
- Appearance's Legs must have a record in the LegsType table.
- Appearance's SkinTone must have a record in the SkinToneType table.
- Appearance's Body must have a record in the BodyType table.
- HeadType name must be unique.
- HeadType name cannot be Null.
- HeadType name cannot be more than 50 characters.
- TorsoType name must be unique.
- TorsoType name cannot be Null.
- TorsoType name cannot be more than 50 characters.
- LegsType name must be unique.
- LegsType name cannot be Null.
- LegsType name cannot be more than 50 characters.
- SkinToneType name must be unique.
- SkinToneType name cannot be Null.
- SkinToneType name cannot be more than 50 characters.
- BodyType name must be unique.
- BodyType name cannot be Null.

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- BodyType name cannot be more than 50 characters.

Player Attribute Constraints:

- PowerType name must be unique.
- PowerType name cannot be Null.
- PowerType name cannot be more than 50 characters.
- PowerType can have multiple properties and each property cannot be more than 100 characters.
- Class name cannot be more than 50 characters.
- Class's Subclass must have a record in the SubclassType table.
- Class must have 2 Subclasses.
- Class description cannot be more than 200 characters.
- Class does not need to have Resistances, but if they do, the Resistances must be present in the DamageType Table.
- Class does not need to have Weaknesses, but if they do, the Weaknesses must be present in the DamageType Table.
- Class must have one or more Abilities and the Abilities must be present in the AbilityType Table.
- SubclassType must have one or more Abilities and the Abilities must be present in the AbilityType Table.
- SubclassType name must be unique.
- SubclassType name cannot be Null.
- SubclassType name cannot be more than 50 characters.
- DamageType name must be unique.

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- DamageType name cannot be Null.
 - DamageType name cannot be more than 50 characters.
 - AbilityType name must be unique.
 - AbilityType name cannot be Null.
 - AbilityType name cannot be more than 50 characters.
 - AbilityType can have multiple properties and each property cannot be more than 100 characters.

Item Constraints:

- Weapon does not need to have a Class requirement, but if they do, the Class must be present in the Class Table.
- Weapon name cannot be more than 50 characters.
- Weapon description cannot be more than 200 characters.
- Weapon damage cannot be Null.
- Weapon damage must be ≥ 0 .
- Weapon's DamageType must be present in the DamageType Table.
- Weapon's durability cannot be Null.
- Weapon's sell value cannot be Null.
- Weapon's sell value must be ≥ 0 .
- Armor does not need to have a Class requirement, but if they do, the Class must be present in the Class Table.
- Armor name cannot be more than 50 characters.
- Armor description cannot be more than 200 characters.
- Armor's defense value cannot be Null.

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- Armor does not need to have Resistances, but if they do, the Resistances must be present in the DamageType Table.
 - Armor does not need to have Weaknesses, but if they do, the Weaknesses must be present in the WeaknessType Table.
 - Armor's durability cannot be Null.
 - Armor's sell value cannot be Null.
 - Armor's sell value must be ≥ 0 .
 - Item name cannot be more than 50 characters.
 - Item description cannot be more than 200 characters.
 - Item use cannot be more than 200 characters.
 - Item's sell value cannot be Null.
 - Item's sell value must be ≥ 0 .

Location and Quest Constraints:

- Location name cannot be more than 50 characters.
- Location description cannot be more than 200 characters.
- Location can have multiple deals and each deal cannot be more than 50 characters.
- Quest does not need to have a Weapon as a reward, but if it does, the Weapon must be present in the Weapon Table.
- Quest does not need to have an Item as a reward, but if it does, the Item must be present in the Item Table.
- Quest does not need to have Armor as a reward, but if it does, the Armor must be present in the Armor Table.
- Quest does not need an Item as a requirement, but if it does, the Item must be present in the Item Table.

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- Quest does not need an Item as a completion requirement, but if it does, the Item must be present in the Item Table.
 - Quest does not need a Class as a requirement, but if it does, the Class must be present in the Class Table.
 - Quest does not need Enemies as a completion requirement, but if it does, the Enemies must be present in the Enemy Table.
 - Quest does not need a Boss as a completion requirement, but if it does, the Boss must be present in the Boss Table.
 - Quest name cannot be more than 50 characters.
 - Quest description cannot be more than 200 characters.
 - Quest currency reward must be ≥ 0 .
 - Quest can have multiple completion requirements and each completion requirement cannot be more than 100 characters.

Enemy Constraints:

- Enemy must be in 1 Location at any given time that must have a record in the Location Table.
- Enemy does not need to drop an Item, but if it does, the Item must be on the Item Table.
- Enemy does not need to drop a Weapon, but if it does, the Weapon must be on the Weapon Table.
- Enemy does not need to drop Armor, but if it does, the Armor must be on the Armor Table.
- Enemy name cannot be more than 50 characters.
- Enemy description cannot be more than 200 characters.
- Enemy currency reward must be ≥ 0 .

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- Enemy HP cannot be Null.
 - Enemy does not need to have Resistances, but if they do, the Resistances must be present in the DamageType Table.
 - Enemy does not need to have Weaknesses, but if they do, the Weaknesses must be present in the DamageType Table.
 - Enemy damage cannot be Null.
 - Enemy damage must be ≥ 1 .
 - Enemy's DamageType must be present in the DamageType Table.
 - Enemy level cannot be Null.
 - Enemy level must be ≥ 1 and ≤ 100 .

NPC and Shop Constraints:

- NPC must be in 1 Location at any given time that must have a record in the Location Table.
- NPC does not need to have a Shop it runs, but if it does, the Shop must be present in the Shop Table.
- NPC does not need to have a Quest it gives, but if it does, the Quest must be present in the Quest Table.
- NPC name cannot be more than 50 characters.
- NPC description cannot be more than 200 characters.
- NPC can have multiple speech bubbles and each speech bubble cannot be more than 200 characters.
- Shop must be in 1 Location at any given time that must have a record in the Location Table.

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- Shop does not need to have Weapons that they sell, but if they do, the Weapons must be present in the Weapon Table.
 - Shop does not need to have Armor that they sell, but if they do, the Armor must be present in the Armor Table.
 - Shop does not need to have Items that they sell, but if they do, the Items must be present in the Items Table.
 - Shop name cannot be more than 50 characters.

Party Constraints:

- Party must be made up of 1 to 10 Players that must be present in the Player Table.
- Party does not need to have accepted Quests, but if they do, the Quests must be present in the Quest Table.
- Party name cannot be more than 50 characters.

Boss Constraints:

- Boss must be in 1 Location at any given time that must have a record in the Location Table.
- Boss does not need to drop an Item, but if it does, the Item must be on the Item Table.
- Boss does not need to drop a Weapon, but if it does, the Weapon must be on the Weapon Table.
- Boss does not need to drop Armor, but if it does, the Armor must be on the Armor Table.
- Boss name cannot be more than 50 characters.
- Boss description cannot be more than 200 characters.
- Boss currency reward must be ≥ 0 .
- Boss HP cannot be Null.

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- Boss does not need to have Resistances, but if they do, the Resistances must be present in the DamageType Table.
 - Boss does not need to have Weaknesses, but if they do, the Weaknesses must be present in the DamageType Table.
 - Boss damage cannot be Null.
 - Boss damage must be ≥ 1 .
 - Boss's DamageType must be present in the DamageType Table.
 - Boss level cannot be Null.
 - Boss level must be ≥ 1 and ≤ 100 .

Front End Design

Item

Name

Description

Use

Sell Value

0

Save

Cancel

Quest

Save

Cancel

Name

Description

Completion Requirements

Gold Reward

0

Additional Rewards

New

Location

Save

Cancel

Name	<input type="text"/>	
Description	<input type="text"/>	
Deals	<input type="text"/>	
	<input type="text"/>	
		New
Players	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
NPCs	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
Enemies	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
Bosses	<input type="text"/>	View Add Remove

Appearance

Head

▼

Torso

▼

Legs

▼

Skin Tone

▼

Body Type

▼

Save

Cancel

Party

Save

Cancel

Name

Members

[View](#)

[Remove](#)

[View](#)

[Remove](#)

[View](#)

[Remove](#)

[View](#)

[Remove](#)

[View](#)

[Remove](#)

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[Remove](#)

[View](#)

[Remove](#)

[View](#)

[Remove](#)

[View](#)

[Remove](#)

[View](#)

[Remove](#)

Invite

NPC

Save

Cancel

Name

Description

Shop

[View](#) [Add](#) [Remove](#)

Speech Bubbles

[New](#)

Alignment

Light

☐

Dark

☐

Save

Cancel

Power

Name

Properties

[New](#)

Save

Cancel

Boss

Save

Cancel

Name

Description

Level

0

HP

0

Damage

0

Damage Type

▼

Weaknesses

▼

Resistances

▼

New

Gold Reward

0

New

Additional Rewards

Ability

Name

Properties

New

Save

Cancel

Enemy

Save

Cancel

Name	<input type="text"/>
Description	<input type="text"/>
Level	<input type="text" value="0"/>
HP	<input type="text" value="0"/>
Damage	<input type="text" value="0"/>
Damage Type	<input type="text"/> ▼
Weaknesses	<input type="text"/> ▼
Resistances	<input type="text"/> ▼ New
Gold Reward	<input type="text" value="0"/> New
Additional Rewards	<input type="text"/>

Subclass

Name	<input type="text"/>
Abilities	<input type="text"/> View Add Remove
	<input type="text"/> View Add Remove
	<input type="text"/> View Add Remove

Save

Cancel

Shop

Name

Items

▼

New

Weapons

▼

New

Armor

▼

New

Save

Cancel

Class

Save

Cancel

Name

Description

Subclasses

View

View

Weaknesses

▼

New

Resistances

▼

New

Abilities

View

Add

Remove

View

Add

Remove

Weapons

View

Add

Remove

Armor

View

Add

Remove

Armor

SaveCancel

Name

Description

Defense

0

Weaknesses

Resistances

Durability

0

Sell Value

0

Class Requirement

Weapon

SaveCancel

Name

Description

Damage

0

Damage Type

Durability

0

Sell Value

0

Class Requirement

Player

SaveCancel

Username	<input type="text"/>	
Gender	<input type="text"/>	▼
Date of Birth	<input type="text"/>	
Alignment	View	
Class	<input type="text"/>	View
Level	<input type="text" value="0"/>	
HP	<input type="text" value="0"/>	
Power	<input type="text"/>	View
Armor	<input type="text"/>	View Remove
Weapons	<input type="text"/>	View Remove
	<input type="text"/>	View Remove
	<input type="text"/>	View Remove
Gold	<input type="text" value="0"/>	

Main Page

Save

Cancel

Locations	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
Party	<input type="text"/>	View Add Remove
Items	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
Quests	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
	<input type="text"/>	View Add Remove
Appearance	View	

Relational Algebra Statements

List properties (Name, Currency, Level, HP, Alignment, and Class) of a Player

$\pi_{Name, Currency, Level, HP, Alignment, Class.Name, Class.Subclass} (Player)$

List Players Names and Party Name for Party ID = X

$\pi_{Player.Name, Party.Name} (\sigma_{Party.PartyID = X} Player \bowtie (Player.PartyCD = PartyID) Party)$

List the number of Players in a Party

$\pi_{Player.Name, cnt} (\sigma_{Party.Name} F_{count(Player.PlayerID)} Player \bowtie (Player.PartyCD = Party.PartyID) Party)$

List Weapons, Armor, and Items in a Shop

$\pi_{ID, Name, Description, Damage, DamageType, Durability, SellValue, ClassRequirement} (Weapon)$

$\cap \pi_{ID, Name, Description, Damage, Defense, Weakness, Resistances, Durability, SellValue, ClassRequirement} (Armor)$

$\cap \pi_{ID, Name, Description, Use, SellValue} (Item)$

List details (Name, Description, Number of Deals, Enemies, Shops, NPCs, Bosses, and Quests) of a Location

$\pi_{Name, Description, Deals} (Location)$

$\cap \pi_{Player.Name, cnt} (\sigma_{Location.Name} F_{count(Player.PlayerID)} Player \bowtie (Player.LocationCD = Location.LocationID) Location)$

$\cap \pi_{NPC.Name, cnt} (\sigma_{Location.Name} F_{count(NPC.NPCID)} NPC \bowtie (NPC.LocationCD = Location.LocationID) Location)$

$\cap \pi_{Enemy.Name, cnt} (\sigma_{Location.Name} F_{count(Enemy.EnemyID)} Enemy \bowtie (Enemy.LocationCD = Location.LocationID) Location)$

$\cap \pi_{Boss.Name, cnt} (\sigma_{Location.Name} F_{count(Boss.BossID)} Boss \bowtie (Boss.LocationCD = Location.LocationID) Location)$