# Music Quest CCG Project
## Gianluca Tarquinio

My project was to work on Music Quest CCG.  Once I got the game to run, the first step was for me to play it.  I spent some time playing the game so that I could get a feel for how it played and what it needed.  The first thing that I noticed was that the game really needed taunt.  Taunt is a mechanic from Hearthstone that forbids the player from attacking enemy non-taunt targets while there are enemy taunt targets present.  It's important because it gives the player a way of protecting their health and their important creatures.  The other mechanic that I noticed the game really needed was clear.  Clear refers to a way of damaging or destroying multiple cards at once and is important because it allows a player to regain control of the board when they are behind.  Since these two things weren't in the game, the game wasn't very interesting, as once a player got a significant lead the game might as well be over.  These were the biggest problems that I found, but they weren't the only ones.  I came up with the following list of things that the game needed:

**Game Balance and Mechanics:**
- Taunt: Enemies must attack enemies with taunt before enemies without taunt
- Spells: As it is I don't think there are any spells, so I will add some
- Clear: Spells and possibly card abilities that damage multiple enemy units
- Improve the distribution of mana costs (currently there are not many low-mana cards, and too many high-mana cards)
- Card abilities that affect cards in play
- Balance changes to the existing cards (Some cards are VERY strong)
- Add some sort of healing for cards in play
- Add a mechanic to force the game to end when players run out of cards
- Add some more cards

**UI Changes:**
- Add some indication about what type of action the game is expecting (for example, when you play a card that makes you discard, it isn't clear that your next click will discard the card that you click on)
- Highlight the cards on the board that are ready to attack
- Let the player re-order the cards in their hand
- Make the cards in play collapse to the left as space becomes available
- Add some sort of discard animation
- Right-clicking a card for more info when info on another card is already being shown should replace the old card info with the new card info
- Add an indicator to display the time before your turn is over (not just for the last 5 seconds)

**Features:**
- Deck builder
- Network stuff
- Sound

**Bugs:**
- UI bugs in full screen mode

- You can move for the opponent on their turn
- You can attack yourself
- UI bug when multiple cards are selected to attack without specifying a target
- Encore effects activate when the card is played (this might only be an issue with the Taylor Swift card)

I ended up doing most of these things, except for the things in the "Features" section.  I started with UI changes.  At first, I found the code for the game pretty confusing, and since the UI changes were relatively simple, they allowed me to familiarize myself with the code.  Most notably, I made it clearer which cards are able to attack at any given time, and which card is currently selected for attack.  Once I had finished tweaking the UI, I moved on to implementing the changes to game balance and mechanics.  I started with taunt, first implementing the functionality and then the visuals (cards with taunt have a shield icon at the top).  Next, I added some spells, including some clear.  As I was working on these things, I was also fixing bugs.  The only one that I didn't fix was the strange positioning of objects in full screen mode (as opposed to windowed full screen).  The last thing that I did was rebalance the cards and update the default deck.  This included tweaking existing cards, totally changing existing cards, and adding new cards.  During the process of rebalancing to cards, I made sure that there was a good distribution of mana costs, I made sure that each card was appropriately strong (based on mana cost), I made sure that there was a good set of spells and card effects, and I made sure that there weren't too many redundant cards.  To ensure that I was doing a good job of this, I got feedback from my brother, who is an experienced Hearthstone player.  Here is the set of cards before I rebalanced them (but after I added a few spells), listed by id:

| 0: | 0 mana 3/4, 4 damage to player when played |
|---|---|
| 1: | 2 mana 2/3, heals both players by 3 when played |
| 2: | 1 mana 3/2, charge |
| 3: | 5 mana 6/7, draw one card when played |
| 4: | 2 mana 2/2, soundproof, taunt |
| 5: | 9 mana 8/10, charge |
| 6: | 8 mana 8/8 |
| 7: | 4 mana 5/3, draw one card when played, discard one card when killed |
| 8: | 5 mana 4/4, summon 1/1 at end of each turn |
| 9: | 4 mana 7/1, soundproof |
| 10: | 5 mana 4/6, opponent discards a card |
| 11: | 5 mana 8/3, soundproof |
| 12: | 4 mana 4/1, charge |
| 13: | 5 mana 10/5, discard 5 cards when played |
| 14: | 7 mana 7/7, draw 2 cards when played |
| 15: | 3 mana 5/3 |
| 16: | 4 mana 5/2, lower an enemy card's attack by 2 |
| 17: | 3 mana 4/3 |
| 18: | 3 mana 3/4 |
| 19: | 2 mana 3/4, lower player health by 2 when played |
| 20: | 1 mana 1/2 |
| 21: | 6 mana 5/4, draw card at end of turn |
| 22: | 0 mana 1/1 |

23:     3 mana 6/1, -1/+1 after each turn
24:     5 mana 2/6, draw a card when played
25:     4 mana 4/4, hype, reduce your health my 3 when played
26:     9 mana 10/8
27:     5 mana 4/4, heal player by 3 when played, summon 1/1 at end of turn
28:     6 mana 5/4, draw card at end of turn
29:     2 mana 3/3, soundproof
30:     3 mana 4/1, soundproof
31:     4 mana 5/1, soundproof
32:     5 mana 6/1, soundproof
33:     3 mana 4/1, soundproof
34:     4 mana 5/1, soundproof
35:     1 mana 1/1, soundproof
36:     2 mana 2/1, soundproof
37:     1 mana 1/1, at end of turn summon 1/1
38:     4 mana 2/6
39:     5 mana 6/7
40:     4 mana 5/3
41:     5 mana 6/5
42:     2 mana, player gains 3 health
43:     4 mana, deal 3 damage to all enemy creatures
44:     4 mana, kill an enemy creature
45:     2 mana, deal 5 damage to enemy player
46:     4 mana, +7 attack to a chosen card
47:     4 mana, +7 defense to a chosen card

Here is the set of cards after I rebalanced them, listed by id:

0:      1 mana 3/3, 3 damage to player when played
1:      2 mana 2/3, heals both players by 3 when played
2:      1 mana 3/1, charge
3:      5 mana 5/4, draw one card when played
4:      2 mana 2/2, soundproof, taunt
5:      9 mana 8/10, charge
6:      8 mana 8/8
7:      4 mana 5/3, draw one card when played, discard one card when killed
8:      5 mana 4/4, summon 1/1 at end of each turn
9:      3 mana 2/4, taunt
10:     5 mana 4/6, opponent discards a card
11:     5 mana 8/3, soundproof
12:     3 mana 4/2, charge
13:     5 mana 5/10, discard 3 cards when played, taunt
14:     7 mana 6/6, draw 2 cards when played
15:     3 mana 5/3, discard 1 card
16:     4 mana 5/2, lower an enemy card's attack by 2
17:     3 mana 4/3
18:     3 mana 3/4
19:     2 mana 3/4, lower player health by 2 when played

| 20: | 1 mana 1/2, taunt |
|---|---|
| 21: | 6 mana 5/4, draw card at end of turn |
| 22: | 1 mana 1/1 |
| 23: | 3 mana 6/1, -1/+1 after each turn, taunt |
| 24: | 4 mana 2/6, draw a card when played |
| 25: | 1 mana 2/2 |
| 26: | 9 mana 10/8, taunt |
| 27: | 5 mana 3/3, heal player by 3 when played, summon 1/1 at end of turn |
| 28: | 3 mana 2/3, heal target card by 3 |
| 29: | 2 mana 3/2, soundproof |
| 30: | 3 mana 4/3, soundproof |
| 31: | 6 mana 2/2, +1/+1 to allies when played |
| 32: | 5 mana 5/5, taunt |
| 33: | 5 mana 2/2, 2 damage to enemies when played |
| 34: | 7 mana 4/4, summons 3 fangirls when played |
| 35: | 8 mana 7/8, taunt |
| 36: | 10 mana 5/3, summons itself at the start of your turn |
| 37: | 1 mana 1/1, at end of turn summon 1/1 |
| 38: | 4 mana 3/6 |
| 39: | 5 mana 6/5 |
| 40: | 4 mana 5/3 |
| 41: | 5 mana 6/5 |
| 42: | 1 mana, player gains 3 health |
| 43: | 4 mana, deal 3 damage to all enemy creatures |
| 44: | 3 mana, kill an enemy creature |
| 45: | 2 mana, deal 5 damage to enemy player |
| 46: | 6 mana, +7 attack to a chosen card |
| 47: | 6 mana, +7 defense to a chosen card |
| 48: | 10 mana, kills all creatures |
| 49: | 1 mana, draw 2 cards |
| 50: | 2 mana, deal 4 damage |
| 51: | 5 mana, deal 8 damage |
| 52: | 4 mana, transform an enemy to 1/1 fangirl |
| 53: | 5 mana, +2 attack to friendly creatures |
| 54: | 9 mana, +15 relevance |

Once I had done this, I updated the default deck to reflect the changes that I had made. Since there is not currently a way to use any deck other than the default deck, I tried to make the default deck contain as many different cards and effects as I could, while making sure that the deck was at least decent. As with the rebalancing, I got feedback from my brother to ensure that I was on the right track. Here is the new default deck (the best way to see the deck is just to play the game):

Id: 49, Count: 1
Id: 20, Count: 1
Id: 2, Count: 1
Id: 4, Count: 2

Id: 29, Count: 1
Id: 19, Count: 1
Id: 50, Count: 2
Id: 9, Count: 1
Id: 12, Count: 1
Id: 23, Count: 1
Id: 28, Count: 1
Id: 44, Count: 1
Id: 43, Count: 1
Id: 24, Count: 1
Id: 16, Count: 1
Id: 51, Count: 1
Id: 8, Count: 1
Id: 33, Count: 1
Id: 31, Count: 1
Id: 21, Count: 1
Id: 34, Count: 1
Id: 14, Count: 1
Id: 35, Count: 1
Id: 26, Count: 1
Id: 36, Count: 1
Id: 48, Count: 1
Id: 42, Count: 1
Id: 54, Count: 1

## Next steps:

Here is the list from before, but with the things that I did removed:

**Game Balance and Mechanics:**
- Add a mechanic to force the game to end when players run out of cards

**UI Changes:**
- Add some indication about what type of action the game is expecting (for example, when you play a card that makes you discard, it isn't clear that your next click will discard the card that you click on)
- Let the player re-order the cards in their hand
- Add some sort of discard animation
- Right-clicking a card for more info when info on another card is already being shown should replace the old card info with the new card info

**Features:**
- Deck builder
- Network stuff
- Sound

**Bugs:**
- UI bugs in full screen mode

Of these things, the most important are the deck builder and the network stuff (front end), as they will allow for PvP.  Other that the things listed above, there are a few more things that I think need to be done.  First, currently on the repository for this project there are a number of different branches, worked on by different groups over the past year or so, that have not had their changes merged into master.  There will probably be significant merge conflicts, and there will be balance changes that have to made to the extra cards on those branches to make them consistent (in terms of power) with the rest of the cards.  Next, once the deck builder is working, the default deck should be changed to be more basic, slowly introducing new players to the game, and encouraging them to open card packs and build their own decks.  Additionally, now that the gameplay is more complicated, the AI is very bad.  This won't be as important once there is PvP, but improving the AI is something that should happen eventually.  Lastly, there is always room for more cards.