

Dominion, CMP

www.(name of site).com

Team profile:

Matthew Griffin:

Qualifications:

- Relevant experience in Javascript, CSS, HTML, PHP, SQL
- Past experience automating board game systems using a web based interface.

Strengths:

- Strong knowledge of domain
- Creative
- Good at breaking down large problems

Carlos Perez:

Qualifications:

- Web Development (HTML, CSS, PHP), 9 years of experience.
- Experience with Javascript Frameworks and Vanilla JS
- Graphic Design

Strengths:

- Strong Javascript Skills and knowledge of different frameworks
- Team Management and Overseeing Code Implementations
- Troubleshooting / Fixing Bugs

Brent Parker:

Qualifications:

- JavaScript – 9 months
- HTML and CSS – 1 year
- GitHub – 9 months

Strengths:

- Great troubleshooter
- Some training from senior software engineer
- Loves to learn new things

Project Description:

We will develop a browser based version of the popular board game Dominion. This will be a single player experience designed for players to practice and improve their game play. This game will be accessible through the project website. This will be developed in JavaScript, HTML, and CSS.

Market value of the game

The first edition of Dominion was released in October 2008. The Dominion card game has 4.5 stars on Amazon.com with 1,439 reviews. According to Wikipedia, over 2 million copies of this award-winning game have been sold. Dominion is relatively easily accessible to new players. In Dominion's review on critical board gamers website, Smith mentions that Dominion has an excellent manual which makes it easy for new players to learn the basics.

This game is meant for people who want a game that does take some effort to learn, but not as much as some similar games. A software version of this game will draw in people who enjoy playing the Dominion game, but may not have enough room to set up the cards, or they just want the computer to set up the game, and clean up the mess for them.

Brief overview of game mechanics

Dominion is a game where monarchs must protect their kingdom. The game consists of 2 to 4 players, and a deck of cards.

Deck:

- Three piles of treasure cards: copper, silver, and gold.
- Three piles with victory cards: provinces, duchies, and estates.
- 30 curse cards.
- 250 Kingdom cards with 10 duplicates of 25 different types, 11 of which will be included in this game
- A placeholder card for every type of card.
- A trash-pile card.

Goal:

Earn the most victory points during the game to win.

Rules:

- Players may use one action card from their hand. Directions for that card will be written on the card itself.
- Players may purchase a card from a pile on the table. They must play treasure cards from their hands to do this.
- A player may “**cleanup**,” by placing the purchased card, all played cards, and any remaining cards from their hand into the discard pile.
- A player may “**draw**,” by drawing five cards from their deck to replenish their hand. If there aren’t enough cards in their deck they must shuffle their discard pile, and make it the base of their draw pile.

End of Game:

When the last province is bought, or three piles are empty, (or four piles in a four-player game.) players must count the victory points in their decks, and whichever player has the most points is the winner. If there is a tie, the player who went first loses.

In-depth overview of game mechanics

Dominion uses a modular setup. This entails ten random Kingdom cards being selected to give the game variety and replay ability. Ten copies of each of these cards are added to the supply that is shared by all the players. In addition to those cards, three types of treasure cards and four types of victory point cards are also added to the supply. All seventeen cards will have a name, an image, a cost to buy, and a quantity remaining. Players can spend \$ they earn in the game to move one copy of the card into their discard pile.

Each player has a draw deck, a hand of cards, an area for played cards, and a discard pile. They also have the following three attributes, actions, buys, and \$. At the beginning of that player’s turn, actions and buys are set to 1 and \$ is set to 0. These numbers will change during the turn based on cards played from the player’s hand.

Each player’s draw deck begins with seven copper cards and three estate cards in it. They are shuffled by placing the cards in a random order. At the beginning of the game and at the end of the player’s turn, five cards are moved from the draw deck to the player’s hand. If a player attempts to draw a card when no cards remain in the draw deck, then all the cards from the discard pile are moved to the draw deck and shuffled to randomize the order.

The player’s hand contains the cards drawn from the draw deck. A player may choose to play any of the treasure or action cards by clicking on the card image. Action cards may only be played if the player has available actions in their attributes. If a card can be legally played, it is moved from the player’s hand to the played card area and the game is modified as described on the text of the card. A description of the

cards follows is in the next section. Treasure cards do not require actions and always increase the amount of \$ available to the player.

When a player no longer can or wishes to play more action cards, they may choose to add cards from the supply to their deck. To buy a card, a player needs at least one buy action, \$ at least as great as the cost, and the quantity of the card in the supply must be greater than zero. If the player is able to buy a card they may click on the supply pile and move one copy to their discard pile. When a player can or no longer wishes to buy cards, they end their turn. All cards in the played cards area or remaining in the player's hand are moved to the player's discard pile. The player draws five new cards and the next turn begins.

The last major feature that is necessary for the game is a game state tracker. The game ends either when the last province is purchased or when any three other supply piles are empty. The number of empty piles needs to be tracked to ensure that the game ends at the appropriate time. When the game ends, the total value of victory points in each player's deck is calculated. The player with the highest victory point total wins the game.

Cards that will be used

Treasure Cards:

Copper, Silver, and Gold cards are part of the supply in every game. Copper costs is free to buy and increases \$ by one when played. Silver costs \$3 to buy and increases \$ by 2 when played. Gold costs \$6 to buy and increases \$ by 3 when played.

Victory Point Cards

Estate, Duchy, Province, and Curse cards are part of the supply in every game. They alter a player's victory points by a static value. They cannot be played and do nothing until the game has ended and points are totaled to determine a winner. Estate cards cost \$2 to buy and grant 1 victory point each. Duchy cards cost \$5 to buy and grant 3 victory points each, Province cards costs \$8 to buy, grant 6 victory points each, and when they Province supply pile is empty, the game immediately ends. Curse cards cost \$0 to buy and grant -1 victory points each.

Kingdom Cards

Every game of Dominion includes ten Kingdom cards that vary from game to game. All of these cards have unique text that grant unique bonuses to the player. This project will implement 11 of the possible Kingdom cards included in the base game. The extra Kingdom card is to demonstrate the variable setup of the game. All of the following cards are action cards that require a player to spend one action in order to play except for Gardens which are a fifth type of Victory Point card.

Name: Chapel

Cost: 2

Text: Trash up to 4 cards from your hand

Comments: Trashing a card permanently removes the card from the game. The player may toggle which cards are selected by clicking on cards in their hand. When the player is happy with their selection there should be a way to indicate that they are finished and the selected cards will be moved to the a trash pile where they will be inaccessible for the remainder of the game.

Name: Council Room

Cost: 5

Text: +4 Cards, +1 Buy, Each other player draws a card

Comments: The current player draws 4 cards and all other players draw one. Additionally, the current player has the option to buy one additional card this turn. In a single player game, there are no other players to draw cards.

Name: Festival

Cost: 5

Text: +2 Actions, +1 Buy, +\$2

Comments: Like all action cards, this requires the player to have an action available in order to play. Once played it grants the abilities in the card text.

Name: Gardens

Cost: 4

Text: Worth 1 Victory Point per 10 cards you have (round down).

Comments: This card is a Victory Point card and cannot be played and does nothing until the end of the game. Unlike the basic Victory Point cards, this does not have a set value. Its value is calculated once

the game is over based on the total number of cards in the player's draw pile, hand, played card area, and discard.

Name: Laboratory

Cost: 5

Text: +2 Cards, +1 Action

Comments:

Name: Market

Cost: 5

Text: +1 card, +1 action, +1 buy, +\$1

Comments:

Name: Smithy

Cost: 4

Text: +3 Cards

Comments:

Name: Village

Cost: 3

Text: +1 Card, +2 Actions

Comments:

Name: Witch

Cost: 5

Text: +2 Cards, Each other player gains a Curse.

Comments: The player draws two cards and moves one curse from the curse card supply pile to the discard of each other player. If there are not enough curses remaining to give one to all other players, then priority is given to the player whose turn is the soonest. No curses are gained in a single player game.

Name: Woodcutter

Cost: 2

Text: +1 Buy, +\$2

Comments:

Name: Workshop

Cost: 3

Text: Gain a card costing up to \$4

Comments: This card is very similar to having \$4 and 1 buy. However, unlike buying cards, gaining a card is mandatory once this card is played. A player may not add \$ to the workshop to gain a card costing more than \$5.

Future implementations

There are several ways that this implementation of Dominion can be expanded.

1. Scoreboard: Many single player games have high score boards so that players can keep track of their improvements and easily compare their best to others. The best way to implement that for this system is to rank the average points per turn that a player earns. The scoreboard should have the player's name, the score, and the ten kingdom cards used. The data would be stored in an external file or database for permanence.

2. Multiplayer: Adding multiplayer would significantly increase the scope of the project. The ideal way would be a networked system with all players at different computers. Another option is the "hot seat" method where players take turns sharing one computer. The main difficulty with the second method is that certain cards require decision making on another player's turn. This could make the game so cumbersome in some situations as to be basically unplayable.

3. A.I.: The most difficult part of creating an AI player is coming up a decision-making algorithm. Fortunately, Dominion has a well-known algorithm available in every game called the "big money strategy". The player buys the most expensive card that they can afford from Provinces, Gold, and

Silver. If they cannot afford any of those cards, they end their turn. This strategy has been described as “the lower bound for advanced play.”

4. Gamelog: This is necessary for multiplayer, but may be helpful for single player. In a multiplayer game, it is important to be able to see what cards were purchased, played, or discarded on other players’ turns. A solitary player may wish to examine past games in order to improve their future play. If a log is generated during the game and is available to download after the game, it is possible for a player to critically examine games that finished long ago. However, the potential audience for that is very limited and the gamelog should be a low priority without multiplayer.

5. Additional Cards: So far 268 unique Kingdom Cards have been officially through the base game and the expansions. An additional 33 are being released in October 2017 bringing the total up to 301. That means that there are more than 400 quadrillion unique combinations of 10 cards. In October, that number will rise to more than a quintillion. Each new card adds more variety than the last, making this an ideal target for future expansion.

Contributions:

Matthew Griffin: Created outline of project description, in-depth overview of game mechanics, cards that will be used, and future implementations. Came up with Dominion game idea.

Carlos Perez: Research project and contributed to ideas and overview the development process. Framework research and ideas on what would be possible to implement before drafting out the plan.

Brent Parker: Created team profile, first paragraph of project description, market value of game, and brief overview of game mechanics.