Base concept: Convert everything a card does to some universal metric so that the program can evaluate and compare them.

Metric Concept 1: Powers

Each effect is assigned a power value, with various other metrics being translated to power. The program will buy cards on its turn accordingly:

* If a supervillain can be bought, buy it.
* If there are 3 or ***FEWER*** supervillains left, maximize the victory point value of your buys (if two or more options have the same value, proceed to the next step, looking at only those combinations)
* With the remaining power, buy the combination of cards that would maximize the average power of your deck.

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| --- | --- | --- |
| Effect | Amount of power | Notes |
| Power | n/a | Power generated is worth the power generated |
| Drawing cards | +Max (1.5 power, avg. of other cards in deck) | The concept behind this is that cards that replace themselves get better as the game goes on, so they should be valued at at least 1.5 to start or you will never buy them early game. Early solution for counting their value when looking at average of power to buy other card draw cards is to always count them as 1.5 when in your deck. However, this is definitely not correct, and will be changed in later iterations. |
| Destroying card from top of deck | +(0.05\*num punches + 0.1\*num vulnerabilities + 0.15 \* num weaknesses) | These numbers are pretty arbitrary, rough evaluation of what the ratio between different card types should be. Destroying cards in different zones has different values. |
| Destroying card from hand | +(0.01\*num punches+ 0.15\*num vulnerabilities + 0.2 \* num weaknesses) | Destroying punches in hand is less good because you’re giving up on power, but you get to look at more cards to destroy weaknesses and vulnerabilities in hand. |
| Destroying card from hand or discard pile | +(0.1\*num punches+ 0.2\*num vulnerabilities + 0.25 \* num weaknesses) | This is obviously the best option, getting to look at your entire discard pile means you will almost always be able to destroy something. |
| Putting a card you buy on top of your deck | +0.5 | May end up being wrong, we’ll see. No easy way to quantify this |
| Discarding a card | -0.5 | You generally end up discarding a vulnerability, weakness or punch. May end up creating a more active way of calculating this, but seems like a good heuristic |
| Defense | +0.5 | I have no clue how to calculate this. Only putting in simple defenses (discard to draw 1 and forcefield) for now, alg will only ever defend supervillains for now. |

Different powers modifiers:

Batman: +1 to all equipment

Hawkman: +1 to all heroes

Black Canary: +1 to all villains

Superman: +1 to all superpowers, if more than 10% of your deck is a given superpower, +0.8 instead, if more than 20% then +0.5. If breaking a tie, take a card you have less copies of. If that is not a sufficient tie-break, always take a card from the line-up over a kick.

Cyborg: +1 to superpowers if you have less than 10% superpowers, + 0.8 if 10-20%, +0 if over 20%, +1 card to equipment if you have less than 10% equipment, + ½ card if 10-20%, +0 if over 20%

Sphinx: +1 card to heroes if you have less than 20%, 20-50% +0.5 cards, over 50% how did this happen but +0

Commodore Vunerable: When evaluating destruction, vulnerabilities are considered punches

Shazam: value of a Shazam activation considered 3 power (2.5 +0.5 from putting on top of deck was the breakdown in my head, may change)

Green lantern:

If proc condition not met:

All cards worth +0.1 power if less than 10% of your deck, drawing a card worth +0.5 power

Proc condition: 60% of your deck not starter cards. For each card that a card could draw, discount one starter card (eg, if you have 7 starters and 6 others, 3 of which draw cards, then treat this as 4 starters and 6 others).

Regardless of whether proc condition is met, if breaking a tie, take a card you have less copies of. If that is not a sufficient tie-break, always take a card from the line-up over a kick.

Aquaman: Cards that draw 1 or more cards are worth 0.2 less

Wonder Woman: TBD

Ideas to fix algorithm:

* has<type> for decks to improve buying of cards that work well with a type
* Adjust the numbers based on various super hero powers (to avoid things like Cyborg valuing kicks too highly
* Value drawing cards higher
* Learn how to play defenses (always defend supervillan attacks?)