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Shuffle and Doom! A Standard Deck Dungeon Crawler Variant

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This article is designed to introduce a dungeon crawler using a standard deck of playing cards, a player token, pencil, and paper. This idea is neither new nor original. There are in fact a few variants of this kind of game available to play online. These include *Standard Deck Dungeon*, *Crawlitaire*, and *Donsol*. The authors wish to contribute to this collection of works with another variant of this game. This variant has minimal story, quick game-play, a simple rule-set, and a fair balance between strategy versus chance.

In this game number cards indicate their value while Jack, Queen, King, and Ace represent 11, 12, 13, and 14, respectively. The Jokers are removed from the deck before the start of the game.

1 Create the Dungeon

In this section we will construct the dungeon.

From a standard deck of playing cards draw fourteen cards face down. Separate the fourteen cards into two stacks of seven. Align the first stack into a horizontal row, and the second stack into a vertical column so both the row and column outline a 7×7 grid. See Figure 1.

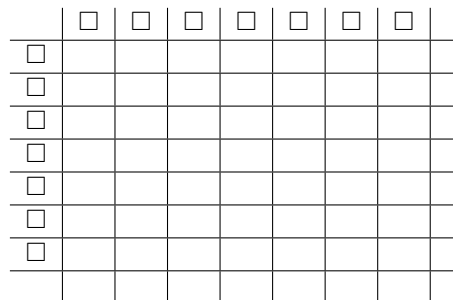


Figure 1: The arrangement of fourteen cards (\square) face down.

Flip each card over taking note of its suit (\heartsuit , \clubsuit , \diamondsuit , and \spadesuit). Observe \heartsuit and \diamondsuit are RED while \clubsuit and \spadesuit are BLACK. Match each coordinate of the 7×7 grid with its respective row and column color. Assign either an X or an 0 via the following rule given in Figure 2.

	BLACK	RED
BLACK	0	X
RED	X	0

Figure 2: The coordinate combinations of BLACK and RED colored suits.

. Once every cell is assigned an X or an 0 , the dungeon is complete. We will refer to this setup as *the dungeon map*. See Figure 3 for an example dungeon map.

Note: If it happens that the entire dungeon map is all (0) , just return all the cards back to the deck, reshuffle, and repeat Step 1.

	♣	◇	♥	♥	♠	♣	◇
♠	0	X	X	X	0	0	X
♠	0	X	X	X	0	0	X
♣	0	X	X	X	0	0	X
♥	X	0	0	0	X	X	0
◇	X	0	0	0	X	X	0
♥	X	0	0	0	X	X	0
♣	0	X	X	X	0	0	X

Figure 3: An example dungeon map.

2 Initializing the Player

In this section we set up the player with their items and statistics.

The dungeon character has four statistics: health indicated by (♥), intelligence indicated by (♣), attack indicated by (♠), and gold indicated by (◇). The health statistic (♥) is the health of the character. This statistic must remain greater than or equal to zero throughout the duration of the game, or the player dies. The intelligence statistic (♣) is the means which the player deactivates traps which may appear in the dungeon. The attack statistic (♠) is the value which the player's attack damage inflicts upon enemies. Finally, the gold statistic (◇) is the player's score. Your dungeon character begins with the following *base statistics*:

1. (♥) 7 Health.
2. (♣) 3 Intelligence.
3. (♠) 3 Attack.
4. (◇) 0 Gold.

From the dungeon map, choose either the seven cards of the row or column from Step 1. This selected stack of seven cards will yield bonus modifiers to the statistic matching its respective suit. For example, according to Figure 3, the choice would be between the stack: (♣, ◇, ♥, ♥, ♠, ♣, and ◇) or (♣, ♠, ♠, ♣, ♥, ◇, ♥, and ♣). The ♥, ♠, and ♣ yield a +5 modifier to health, attack, and intelligence, respectively. The ◇ yields a +1 modifier to any of health, attack, or intelligence. Example: Let b denote the base statistics. From Figure 3, suppose the player chooses the row (♣, ◇, ♥, ♥, ♠, ♣, and ◇). The player's statistics receive the following bonuses: $7b + 2 \times 5♥ = 17♥$, $3b + 2 \times 5 = 8♣$, and $3b + 1 \times 5♠ + 2 \times 1◇ = 10♠$. After modifying the base statistics of the player, all fourteen cards are placed at the bottom of the deck. The dungeon map should no longer have any playing cards.

Place your dungeon character token (P) on the upper left hand corner of the dungeon map just outside of the 7×7 grid. Draw an (F), for the exit, on the lower right hand corner of the dungeon map, again just outside of the 7×7 grid. See Figure 4.

2.1 An Advanced Technique

As stipulated in Step 2, the fourteen cards used to step up the player character's statistics are placed at the bottom of the deck. In particular the rules do not state the deck needs to be shuffled at this step. Thus, the player can expect those particular cards to appear last, if even at all during the course of play. This hint may be beneficial to the player when choosing the player character statistics (Ex. if $A♣, K♣Q♣$, and $J♣$ appear in Step 2, and the dungeon has only 25 filled cells, then the player need not worry about coming across the high value traps. They can spend gold (◇) to improve health (♥) or attack (♠) with minimal risk).

P							
	0	X	X	X	0	0	X
	0	X	X	X	0	0	X
	0	X	X	X	0	0	X
	X	0	0	0	X	X	0
	X	0	0	0	X	X	0
	X	0	0	0	X	X	0
	0	X	X	X	0	0	X
							F

Figure 4: The dungeon with player token (P).

3 Moving Through the Dungeon

In this section we move the player around the dungeon.

Recall from Step 2, and Figure 4 that the dungeon map is a 7×7 grid comprised of cells marked with (X) and (0). Recall also that the player token (P) was on the upper-left hand cell outside of the 7×7 grid. All cells of the same symbol that are connected by at least one edge are considered part of the same room. For example, according to Figure 4, the first room just down-right (SOUTH-EAST) of the player is a 1×3 room consisting of (0) cells.

The player enters the dungeon from the first upper-left cell of the 7×7 dungeon. From that cell, the player may move the player token (P) one cell at a time in any cardinal direction (NORTH, EAST, SOUTH, and WEST) inside the 7×7 grid. The player may not exit the 7×7 grid apart from the bottom right cell leading to F . Once moved, the player checks to see what symbol they have landed upon according to the following rules:

1. The player lands on a (0). This is referred to as an *empty cell*, and is part of an *empty room*. No further action is required, and the player may move again freely.
2. The player lands on a (X). This is referred to as a *filled cell*, and is part of a *filled room*. Landing upon a (X), the player proceeds to Step 4.

4 Entering a Filled Room

In this section we initialize a filled room.

Starting from the cell the player token landed upon, count the number of filled cells (X) that are connected by at least one edge. The sum is the size S of the filled room. For example refer to Figure 5. The player token (P) has entered a 3×3 filled room.

	0	P	X	X	0	0	X
	0	X	X	X	0	0	X
	0	X	X	X	0	0	X
	X	0	0	0	X	X	0
	X	0	0	0	X	X	0
	X	0	0	0	X	X	0
	0	X	X	X	0	0	X
							F

Figure 5: The player token (P) entering a 3×3 filled room.

Draw S number of cards from the top of the deck, and lay them out face up. These are the entities in the filled room. Each card has both a suit and value, which is interpreted as follows:

1. (♥) is a health potion. Its number represents the number of health it provides.
2. (♣) is a trap (or book). Its number is the damage it deals if activated (or intelligence gained).
3. (♠) is an enemy. Its number is both the damage it deals as well as its health.
4. (◇) is gold. Its number is its value.

The filled room is now initialized for game play. The player may proceed to Step 5.

5 Clearing a Filled Room

In this section, we clear a filled room.

Recall from Step 4 that a filled room has any of the following items: health potions (♥), traps/books (♣), enemies (♠), and gold (◇). The general procedure for a filled room is as follows:

1. Defeat the enemies.
2. Deactivate the traps.
3. Collect the health potions, books, and gold.
4. Exit the room.

Each step will now be described in detail.

5.1 Defeat the Enemies (♠)

The player uses their attack (♠) statistic to defeat enemies one at a time. If the player's attack is greater than or equal to the number on the enemy's card, then the enemy is defeated, and placed on the bottom of the deck. If the player cannot defeat an enemy, they may still damage it with damage equal to the amount of attack the player deals. This enemy's health and attack is reduced permanently. The player may now use any health potions (♥) in their hand to temporarily increase their health statistic (Ex. $7♥$ base health + $6♥$ health potion = $10♥$ health). Used health potions go to the bottom of the deck. After defeating or damaging a single enemy and using any consumable health potions, all the remaining enemies attack with damage associated to the value of the card (apart from those already damaged). Their attack reduces the player's health (♥). If the player's health goes below zero then the player dies and the game is over. Else, the player must continue fighting the enemies in the room one by one until all are defeated. The player is not allowed to retreat.

5.2 Activate or Deactivate the Traps (♣) in the Room

Traps (♣) are similar to enemies, except they only attack once, and only attack if activated. A trap is activated by taking any health potion (♥) or gold (◇) in the room. All traps are activated simultaneously. Each trap reduces the player's health equal to its value. The player deactivates traps one at a time. To deactivate a trap, a player uses their intelligence (♣) statistic. If their intelligence is greater than or equal to the value of the trap card, they may deactivate it. The player may use (♣) cards, called *books*, in their hand to increase their intelligence statistic. A deactivated trap, and any books used to deactivate it, are placed at the bottom of the deck. If there are no health potions (♥) or gold (◇) in the room, then the (♣) cards are interpreted as books that can be collected as loot. They provide a permanent bonus to intelligence.

If a player cannot deactivate the traps, they have two options. The player may take one item from the room, thus activating all traps. The player receives damage according to the value of each (♣) card in the room. All the remaining items, apart from the item the player took, are destroyed. Alternatively, the player may now retreat the room. The player token (P) is moved to any empty cell (0) outside of the filled room. The traps activate destroying all the items in the filled room the player was in previously. However, since the player token is no longer in the filled room, the player takes no damage. The room is now considered empty and all the cards associated to the room are placed at the bottom of the deck.

5.3 Collect the Loot (♥, ♦, and ♣)

Once all the enemies are defeated, and the traps are either activated or deactivated, then the player may take the remaining health potions (♥), gold (♦), and possibly (♣) scrolls in the room. The room is now considered empty. The player may resume exploring the dungeon starting from Step 3 with the current position.

5.4 An Advanced Technique

When the player first enters a room, they may consume as many health potions (♥) as they have in their hand. Then, they may take one health potion (♥) or gold (♦) from the room, thus activating the traps (♣). The traps do damage to the player as well as all the enemies in the room (♠). All the enemies take the corresponding damage from the trap, and are stunned for a single turn. The remaining items (♥ and ♦) are destroyed and placed at the bottom of the deck. The player receives one free attack, then proceeds to Section 5.1 (E.g. two attacks in total). If there are no traps in the room, the player may not use this technique.

6 End of Game

In this section, we finish the game.

Steps 3-5 are repeated until one of three conditions are met:

1. The player dies. The player's score is 0, and the game is over.
2. The player arrives at the bottom right cell of the 7×7 alive. They may then exit the dungeon through the cell marked (F) leaving one or more filled rooms unexplored. Their score is the amount of gold they collected (Ex. $4♦ + 6♦ + 5♦ = 15♦$).
3. All the rooms are explored and emptied. The player does not need to move to the bottom right cell for this victory condition to be met, since the dungeon is empty. The player's score is the amount of gold (♦) they collected times two (Ex. $2 \times (4♦ + 6♦ + 5♦) = 30♦$)

7 Additional Considerations

In this section, we discuss some methods to modify the game for various kinds of play.

7.1 Difficulty Settings

To decrease the difficulty setting the player may consider the following:

1. Increase the base statistics of the player character to seven health (♥), seven intelligence (♣), seven attack (♠), and zero gold (♦).
2. If in Step 1, a filled room (X) is larger than 4×4 , then swap one of the RED/BLACK cards on a row or column. Thus, a large room is broken up into smaller rooms.
3. A player character can retreat a room either before attacking, or after the enemy's attack phase. The cards associated to that room are placed to the side until the player character returns to the room.
4. A player character can retreat a room with traps without activating the traps. Again, the cards associated to that room are placed to the side until the player character returns to the room.

To increase the difficulty setting the player may consider the following:

1. If in Step 1, a filled room (X) is 1×1 , then swap one of the RED/BLACK cards on a row or column. Thus, a set of small rooms is combined into a larger room.

2. Consumable items such as health potions (\heartsuit) and scrolls (\clubsuit) provide a temporary statistic modifiers to the player character lasting a single turn.
3. Each consumable item such as health potions (\heartsuit), scrolls (\clubsuit) and attack cards (\spadesuit) only provide a +3 to their respective statistic regardless of their value.

7.2 Expansion of Play

To generalize the size of the game consider the following:

Regarding Step 1, the 7×7 dungeon map was designed so that the player would only come across a dungeon of at most 49 filled cells (X). However, this is a conservative constraint. One could expand the grid up to 26×26 or contract to a 4×4 . This is considered the *expanded dungeon map*. Game play is essentially the same, but has a few modifications to the rules for better play. In Step 2, the base statistics remain the same. However the value of the bonus modifiers changes in the following manner:

Size of Dungeon	4	5	6	7	8	9	10	11	12	13	14	15	...	26
Bonus modifier	7	6	6	5	5	4	4	3	3	2	2	1	...	1

In the case of larger dungeons, the deck will become exhausted. If the dungeon still has filled rooms, then the following procedure is followed: first, the deck is reshuffled. Then, all subsequent card values drawn are doubled (Ex. $2\heartsuit \rightarrow 4\heartsuit$ yields four health points). This process continues until every room of the dungeon is cleared. It may be the deck is exhausted while drawing cards for a filled room. In that case the deck, apart from the cards drawn, is reshuffled and subsequent cards for that room are doubled. The cards drawn originally retain their original value.

To make the size of the dungeon unbounded, consider the following:

One could continue tiling the expanded dungeon map indefinitely, with the alternative goal of collecting as much gold \diamond cards as possible. Since card values will continue to double, eventually they will supersede the player's ability to attack, and the player will have to retreat. In this case, the player exits through the same cell they began the game in. Their score (provided they did not die) is the amount of gold they have acquired, multiplied by the number of times they have exhausted the deck.

8 Example Playthroughs

In this section, we present five model game-play playthroughs using the 4×4 , 7×7 , 13×13 , 19×19 , and 26×26 grids. This is designed to assist new players in understanding the rules of the game.

8.1 Playthrough 1: 4×4 Dungeon

The cards drawn were: ($Q\diamond, A\heartsuit, K\heartsuit, 10\heartsuit$) and ($2\heartsuit, Q\spadesuit, K\diamond, 7\spadesuit$).

The dungeon map appears as follows:

P				
	0	0	0	0
	X	X	X	X
	0	0	0	0
	X	X	X	X
				F

Chosen: ($2\heartsuit, Q\spadesuit, K\diamond, 7\spadesuit$).

Initial character statistics are (b = base value):

1. $7b + 7\heartsuit = 14\heartsuit$.

2. $3b + 2 \times 7\spadesuit = 17\spadesuit$.
3. $3b + 1\heartsuit = 4\clubsuit$.

First room:
 (5♣, 6♦, K♠, 5♦)
 Clearing room:

1. Hit K♠ and it dies.
2. I am not intelligent enough to deactivate the 5♣ trap.
3. I take the 6♦ gold, thus activating the trap.
4. 5♣ trap is activated dealing five damage $14\heartsuit \rightarrow 9\heartsuit$. Also, 5♦ is destroyed.

Second Room:
 (7♥, 5♠, 10♦, 5♥)
 Clearing room:

1. Hit 5♠ and it dies.
2. Collect loot: 7♥, 10♦, and 5♥.
3. Use health potion 5♥ restoring health $9\heartsuit \rightarrow 14\heartsuit$.

Exit dungeon, cleared. Thus $2 \times (10 + 6) = 2 \times 16 = 32\heartsuit$.

8.2 Playthrough 2: 7 × 7 Dungeon

The cards drawn were: (7♥, 2♦, 9♦, K♥, 9♣, 5♣, J♠) and (10♦, K♠, 6♣, 4♥, 3♣, 7♠, 10♠).

The dungeon map appears as follows:

P								
	0	0	0	0	X	X	X	
	X	X	X	X	0	0	0	
	X	X	X	X	0	0	0	
	0	0	0	0	X	X	X	
	X	X	X	X	0	0	0	
	X	X	X	X	0	0	0	
	X	X	X	X	0	0	0	
								F

Chosen: (10♦, K♠, 6♣, 4♥, 3♣, 7♠, 10♠).

Initial character statistics are (b = base value):

1. $7b + 1 \times 5\heartsuit = 12\heartsuit$.
2. $3b + 3 \times 5\spadesuit = 18\spadesuit$.
3. $3b + 2 \times 5\clubsuit + 1\heartsuit = 14\clubsuit$.

First room:
 (J♥, A♥, A♠)
 Clearing room:

1. Hit A♠ and it dies.

2. Collect loot: $J\heartsuit, A\heartsuit$.

Second room:

($2\clubsuit, 7\clubsuit, 8\heartsuit$)

Clearing room:

1. Deactivate traps: $2\clubsuit, 7\clubsuit$.
 2. Collect loot: $8\heartsuit$.
-

Third room:

($3\spadesuit, 8\diamond, K\diamond, 4\clubsuit, 2\spadesuit, A\diamond, 9\heartsuit, 8\clubsuit$)

Clearing room:

1. Hit $3\spadesuit$ and it dies.
 2. $2\spadesuit$ attacks, dealing two damage: $12\heartsuit \rightarrow 10\heartsuit$.
 3. Hit $2\spadesuit$ and it dies.
 4. Deactivate traps: $4\clubsuit, \clubsuit$.
 5. Collect loot: $8\diamond, K\diamond, A\diamond, 9\heartsuit$.
 6. Use $8\heartsuit$ health potion $10\heartsuit \rightarrow 18\heartsuit$.
-

Fourth room:

($5\diamond, Q\heartsuit, J\clubsuit, 10\heartsuit, 5\spadesuit, 9\spadesuit, J\diamond, 4\diamond, 6\diamond, 6\heartsuit, 3\heartsuit, Q\spadesuit$)

Clearing room:

1. Hit $Q\spadesuit$ and it dies.
 2. $5\spadesuit$ and $9\spadesuit$ attack dealing fourteen damage: $18\heartsuit \rightarrow 4\heartsuit$.
 3. Use $A\heartsuit$ health potion $4\heartsuit \rightarrow 18\heartsuit$.
 4. Hit $9\spadesuit$ and it dies.
 5. $5\spadesuit$ attacks dealing five damage: $18\heartsuit \rightarrow 13\heartsuit$.
 6. Attack $5\spadesuit$ and it dies.
 7. Deactivate trap: $J\clubsuit$.
 8. Collect loot: $5\diamond, Q\heartsuit, 10\heartsuit, J\diamond, 4\diamond, 6\diamond, 6\heartsuit, 3\heartsuit$.
 9. Use $6\heartsuit$ health potion: $13\heartsuit \rightarrow 19\heartsuit$.
-

Exit dungeon, cleared. Thus $2 \times (4 + 5 + 6 + 8 + J + K + A) = 2 \times 61 = 122\diamond$.

8.3 Playthrough 3: 13×13 Dungeon

The cards drawn were: ($A\spadesuit, 7\diamondsuit, 2\clubsuit, J\spadesuit, 6\heartsuit, 9\heartsuit, 10\clubsuit, 3\heartsuit, 10\diamondsuit, 3\clubsuit, 2\spadesuit, 4\heartsuit, 3\diamondsuit$) and ($8\diamondsuit, 8\spadesuit, 7\heartsuit, 5\spadesuit, 7\spadesuit, 4\diamondsuit, 6\clubsuit, 10\spadesuit, A\diamondsuit, Q\diamondsuit, 6\diamondsuit, 6\spadesuit, J\clubsuit$).

The dungeon map appears as follows:

P														
	X	0	X	X	0	0	X	0	0	X	X	0	0	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
	X	0	X	X	0	0	X	0	0	X	X	0	0	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
	X	0	X	X	0	0	X	0	0	X	X	0	0	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
	X	0	X	X	0	0	X	0	0	X	X	0	0	
	X	0	X	X	0	0	X	0	0	X	X	0	0	
	X	0	X	X	0	0	X	0	0	X	X	0	0	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
	0	X	0	0	X	X	0	X	X	0	0	X	X	
														F

Chosen: ($8\diamondsuit, 8\spadesuit, 7\heartsuit, 5\spadesuit, 7\spadesuit, 4\diamondsuit, 6\clubsuit, 10\spadesuit, A\diamondsuit, Q\diamondsuit, 6\diamondsuit, 6\spadesuit, J\clubsuit$).

Initial character statistics are (b = base value):

1. $7b + 1 \times 2\heartsuit + 4\diamondsuit = 13\heartsuit$.
2. $3b + 5 \times 2\spadesuit + 1\diamondsuit = 14\spadesuit$.
3. $3b + 2 \times 2\clubsuit = 7\clubsuit$.

First room:

($K\spadesuit$)

Clearing room:

1. Hit $K\spadesuit$ and it dies.

Second room:

($Q\heartsuit$)

Clearing room:

1. Collect loot $Q\heartsuit$.

Third room:

($9\clubsuit$)

Clearing room:

1. Collect loot $9\clubsuit$.
2. Read book: $7\clubsuit \rightarrow 16\clubsuit$.

Fourth room:

($Q\spadesuit, 2\heartsuit$)

Clearing room:

1. Hit $Q\spadesuit$ and it dies.

2. Collect loot: $2\heartsuit$.

Fifth room:

($Q\clubsuit$)

Clearing room:

1. Collect loot: $Q\clubsuit$.

Sixth room:

($9\diamond, 8\heartsuit$)

Clearing room:

1. Collect loot: $9\diamond, 8\heartsuit$.

Seventh room:

($5\diamond, J\heartsuit, 3\spadesuit, A\heartsuit$)

Clearing room:

1. Hit $3\spadesuit$ and it dies.

2. Collect loot: $5\diamond, J\heartsuit, A\heartsuit$

Eighth room:

($10\heartsuit, 7\clubsuit, K\diamond, 5\clubsuit$)

Clearing room:

1. Deactivate traps: $7\clubsuit, 5\clubsuit$.

2. Collect loot: $10\heartsuit, K\diamond$.

Note: We are now at the end of the dungeon. We could choose to leave now and receive a score of $1 \times (9 + 5 + K) = 27\diamond$. However, we choose to continue on.

Ninth room:

($5\heartsuit, 8\clubsuit, 4\spadesuit, 2\diamond, K\clubsuit, 8\spadesuit$)

Clearing room:

1. Hit $8\spadesuit$ and it dies.

2. $4\spadesuit$ attacks dealing four damage: $13\heartsuit \rightarrow 9\heartsuit$.

3. Hit $4\spadesuit$ and it dies.

4. Deactivate traps: $8\clubsuit, K\clubsuit$.

5. Collect loot: $5\heartsuit, 2\diamond$

6. Use $5\heartsuit$ health potion: $9\heartsuit \rightarrow 14\heartsuit$.

Tenth room:

($A\clubsuit, 4\clubsuit, K\heartsuit, J\diamond$)

Clearing room:

1. Deactivate traps: $A\clubsuit, 4\clubsuit$.

2. Collect loot: $K\heartsuit, J\heartsuit$

Eleventh room:
($A\spadesuit, 8\heartsuit, 7\heartsuit, 2\clubsuit$)
Clearing room:

1. Hit $A\spadesuit$ and it dies.
 2. Deactivate traps: $2\clubsuit$.
 3. Collect loot: $8\heartsuit, 7\heartsuit$.
-

Twelfth room:
($J\spadesuit, 6\heartsuit, 9\heartsuit, 10\clubsuit$)
Clearing room:

1. Hit $J\spadesuit$ and it dies.
 2. Deactivate traps: $10\clubsuit$.
 3. Collect loot: $6\heartsuit, 9\heartsuit$.
-

Thirteenth room:
($3\heartsuit, 9\spadesuit$)
Clearing room:

1. Hit $9\spadesuit$ and it dies.
 2. Collect loot: $3\heartsuit$.
-

Fourteenth room:
($7\heartsuit$)
Clearing room:

1. Collect loot: $7\heartsuit$.
-

Fifteenth room:
($5\spadesuit, 7\spadesuit$)
Clearing room:

1. Hit $7\spadesuit$ and it dies.
 2. $5\spadesuit$ attacks dealing five damage: $14\heartsuit \rightarrow 9\heartsuit$.
 3. Hit $5\spadesuit$ and it dies.
 4. Use $2\heartsuit$ and $3\heartsuit$ health potions: $9\heartsuit \rightarrow 14\heartsuit$.
-

Sixteenth room:
($4\heartsuit, 10\heartsuit$)
Clearing room:

1. Collect loot: $4\heartsuit, 10\heartsuit$.

Seventeenth room:

(3♣)

Clearing room:

1. Collect loot: 3♣.
-

Eighteenth room:

(6♣, 2♠)

Clearing room:

1. Hit 2♠ and it dies.
 2. Collect loot: 6♣.
-

Nineteenth room:

(4♥, 10♠, 3♦, A♦)

Clearing room:

1. Hit 10♠ and it dies.
 2. Collect loot: 4♥, 3♦, A♦.
-

Twentieth room:

(Q♦, 6♦, 6♠, J♣)

Clearing room:

1. Hit 6♠ and it dies.
 2. Deactivate trap: J♣.
 3. Collect loot: Q♦, 6♦.
-

Note: We have hit the end of the deck. Thus, we use every health potion, read every book, and count our gold.

1. Health: $14 + 4 + 9 + 6 + 7 + 8 + 10 + J + Q + K = 94♥$.
2. Intelligence: $16 + 6 + 3 + Q = 37♣$.
3. Gold: $2 + \dots + A = 104♦$.

Now, we return all the cards to the deck, reshuffle, and continue. All subsequent cards are worth double their value.

Twenty-first room:

(10 + 10♦, 9 + 9♣)

Clearing room:

1. Deactivate trap: 9 + 9♣.
2. Collect loot: 10 + 10♦.

Twenty-second room:

$(Q + Q♠, A + A♣)$

Clearing room:

1. Hit $Q + Q♠$ dealing fourteen damage: $24♠ \rightarrow 10♠$.
 2. $Q + Q♠$ attacks dealing ten damage: $94♥ \rightarrow 84♥$.
 3. Hit $Q + Q♠$ and it dies.
 4. Collect loot: $A + A♣$.
-

Twenty-third room:

$(5 + 5♥, 10 + 10♥)$

Clearing room:

1. Collect loot: $5 + 5♥, 10 + 10♥$.
-

Twenty-fourth room:

$(J + J♥)$

Clearing room:

1. Collect loot: $J + J♥$.
-

Twenty-fifth room:

$(3 + 3♦, K + K♠)$

Clearing room:

1. Hit $K + K♠$ dealing fourteen damage: $26♠ \rightarrow 12♠$.
 2. $K + K♠$ deals twelve damage: $84♥ \rightarrow 72♥$.
 3. Hit $K + K♠$ and it dies.
 4. Collect loot: $3 + 3♦$.
-

Twenty-sixth room:

$(4 + 4♦, J + J♦)$

Clearing room:

1. Collect loot: $4 + 4♦, J + J♦$.
-

Twenty-seventh room:

$(Q + Q♦, K + K♦)$

Clearing room:

1. Collect loot: $Q + Q♦, K + K♦$.
-

Twenty-eighth room:

$(A + A♥, 5 + 5♦, J + J♣)$

Clearing room:

1. Deactivate trap: $J + J\clubsuit$.
 2. Collect loot: $A + A\heartsuit, 5 + 5\heartsuit$.
-

Twenty-ninth room:
 $(6 + 6\heartsuit, 10 + 10\spadesuit, 8 + 8\clubsuit)$
 Clearing room:

1. Hit: $10 + 10\spadesuit$ dealing fourteen damage $20\spadesuit \rightarrow 6\spadesuit$.
 2. $10 + 10\spadesuit$ attacks, dealing six damage: $72\heartsuit \rightarrow 66\heartsuit$.
 3. Deactivate trap: $8 + 8\clubsuit$.
 4. Collect loot: $6 + 6\heartsuit$.
-

Thirtieth room:
 $(K + K\clubsuit, A + A\heartsuit, 2 + 2\spadesuit, 9 + 9\spadesuit)$
 Clearing room:

1. Hit: $9 + 9\spadesuit$ dealing fourteen damage $18\spadesuit \rightarrow 4\spadesuit$.
 2. $9 + 9\spadesuit$ and $2 + 2\spadesuit$ attack, dealing eight damage: $66\heartsuit \rightarrow 58\heartsuit$.
 3. Hit: $9 + 9\spadesuit$ and it dies.
 4. $2 + 2\spadesuit$ attacks, dealing four damage: $58\heartsuit \rightarrow 54\heartsuit$.
 5. Hit: $2 + 2\spadesuit$ and it dies.
 6. Deactivate trap: $K + K\clubsuit$.
 7. Collect loot: $A + A\heartsuit$.
-

Thirty-first room:
 $(10 + 10\clubsuit, Q + Q\clubsuit, K + K\heartsuit, 4 + 4\spadesuit)$
 Clearing room:

1. Hit $4 + 4\spadesuit$ and it dies.
 2. Deactivate traps: $10 + 10\clubsuit, Q + Q\clubsuit$.
 3. Collect loot: $K + K\heartsuit$.
-

Thirty-second room:
 $(7 + 7\heartsuit, Q + Q\heartsuit, 6 + 6\clubsuit, J + J\spadesuit, 8 + 8\heartsuit, 2 + 2\clubsuit)$
 Clearing room:

1. Hit $J + J\spadesuit$ dealing fourteen damage $22\spadesuit \rightarrow 8\spadesuit$.
 2. $J + J\spadesuit$ attacks dealing eight damage: $54\heartsuit \rightarrow 46\heartsuit$.
 3. Hit $J + J\spadesuit$ and it dies.
 4. Deactivate traps: $6 + 6\clubsuit, 2 + 2\clubsuit$.
 5. Collect loot: $7 + 7\heartsuit, Q + Q\heartsuit, 8 + 8\heartsuit$.
-

Exit dungeon, cleared. Thus $2 \times (104 + 2 \times (93)) = 2 \times (104 + 186) = 580\heartsuit$.

8.4 Playthrough 4: 19×19 Dungeon

The cards drawn were: ($4\heartsuit, 6\clubsuit, 6\diamond, J\clubsuit, A\heartsuit, 4\spadesuit, 5\heartsuit, 8\spadesuit, K\heartsuit, Q\heartsuit, 3\clubsuit, 6\heartsuit, 2\clubsuit, 8\heartsuit, 7\heartsuit, 10\heartsuit, Q\diamond, 5\clubsuit, 5\spadesuit$) and ($K\diamond, 9\diamond, 2\heartsuit, Q\spadesuit, J\spadesuit, 9\clubsuit, 10\clubsuit, A\diamond, 7\spadesuit, 3\spadesuit, K\clubsuit, 9\spadesuit, 4\heartsuit, 9\heartsuit, 7\diamond, 2\diamond, 4\clubsuit, 6\spadesuit, A\clubsuit$).

The dungeon map appears as follows:

P																			
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	0	X	0	X	0	X	0	X	0	0	X	0	X	0	0	0	0	X	X
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
	X	0	X	0	X	0	X	0	X	X	0	X	0	X	X	X	X	0	0
																			F

Chosen: ($(K\diamond, 9\diamond, 2\heartsuit, Q\spadesuit, J\spadesuit, 9\clubsuit, 10\clubsuit, A\diamond, 7\spadesuit, 3\spadesuit, K\clubsuit, 9\spadesuit, 4\heartsuit, 9\heartsuit, 7\diamond, 2\diamond, 4\clubsuit, 6\spadesuit, A\clubsuit)$).

Initial character statistics are (b = base value):

- $7b + 3 \times 1\heartsuit + 3\diamond = 13\heartsuit$.
- $3b + 6 \times 1\spadesuit + 2\diamond = 11\spadesuit$.
- $3b + 5 \times 1\clubsuit = 8\clubsuit$.

First room:

($5\diamond, 8\diamond, 7\clubsuit$)

Clearing room:

- Deactivate traps: $7\clubsuit$.
- Collect loot: $5\diamond, 8\diamond$.

Second room:

($10\diamond$)

Clearing room:

- Collect loot: $10\diamond$.

Third room:

($Q\clubsuit$)

Clearing room:

- Collect loot: $Q\clubsuit$.

Fourth room:

($K\spadesuit$)

Clearing room:

1. Hit $K\spadesuit$ dealing eleven damage $K\spadesuit \rightarrow 2\spadesuit$.
 2. $K\spadesuit$ attacks dealing two damage $13\heartsuit \rightarrow 11\heartsuit$.
 3. Hit $K\spadesuit$ and it dies.
-

Fifth room:

($A\spadesuit$)

Clearing room:

1. Hit $A\spadesuit$ dealing eleven damage $A\spadesuit \rightarrow 3\spadesuit$.
 2. $A\spadesuit$ attacks dealing three damage $11\heartsuit \rightarrow 8\heartsuit$.
 3. Hit $A\spadesuit$ and it dies.
-

Sixth room:

($3\heartsuit$)

Clearing room:

1. Collect loot: $3\heartsuit$.
 2. Use $3\heartsuit$ health potion: $8\heartsuit \rightarrow 11\heartsuit$.
-

Seventh room:

($2\spadesuit$)

Clearing room:

1. Hit $2\spadesuit$ and it dies.
-

Eighth room:

($8\clubsuit, 10\spadesuit$)

Clearing room:

1. Hit $10\spadesuit$ and it dies.
 2. Collect loot: $8\clubsuit$.
-

Ninth room:

($J\heartsuit, 3\diamondsuit, J\diamondsuit$)

Clearing room:

1. Collect loot: $J\heartsuit, 3\diamondsuit, J\diamondsuit$.
 2. Use $J\heartsuit$ health potion: $11\heartsuit \rightarrow 22\heartsuit$.
-

Tenth room:

($Q\spadesuit, K\diamondsuit, J\spadesuit, 2\heartsuit, 9\diamondsuit, 9\clubsuit, 10\clubsuit, K\clubsuit$)

Clearing room:

1. Hit $Q♠$ dealing eleven damage $Q♠ \rightarrow 1♠$.
2. $Q♠$ and $J♠$ attack dealing twelve damage: $22♥ \rightarrow 10♥$.
3. Hit $J♠$ and it dies.
4. $Q♠$ attacks dealing one damage: $10♥ \rightarrow 9♥$.
5. Hit $Q♠$ and it dies.
6. Read $Q♣$ book: $8♠ \rightarrow 20♠$.
7. Deactivate the traps: $9♣, 10♣, K♣$.
8. Collect loot: $K◇, 2♥, 9◇$.
9. Use $2♥$ health potion: $9♥ \rightarrow 11♥$.

Note: From here, we can exit the dungeon. However, we are in a decent amount of health. It would not be a bad choice to take on smaller rooms to try to collect another health potion.

Eleventh room:
 $(A◇, 7♠, 9♠)$
 Clearing room:

1. Hit $9♠$ and it dies.
2. $7♠$ attack dealing seven damage: $11♥ \rightarrow 4♥$.
3. Hit $7♠$ and it dies.
4. Collect loot: $A◇$.

Note: Observe our health is quite low. Despite that we have already defeated the most powerful enemies of the dungeon, it would only take a pair of mid-level enemies to kill the player character. There are no more 1×1 rooms left in the dungeon. In fact, the smallest rooms remaining are 1×3 rooms. Thus the scenario of having two or more low to mid level enemies is reasonable. We conclude fortune is not on our favor to continue exploring the dungeon. The safest course of action is to exit now, and take the gold gathered thus far.

Exit dungeon, uncleared. Thus $3 + 5 + 8 + 9 + 10 + J + K + A = 73◇$.

8.5 Playthrough 5: 26×26 Dungeon

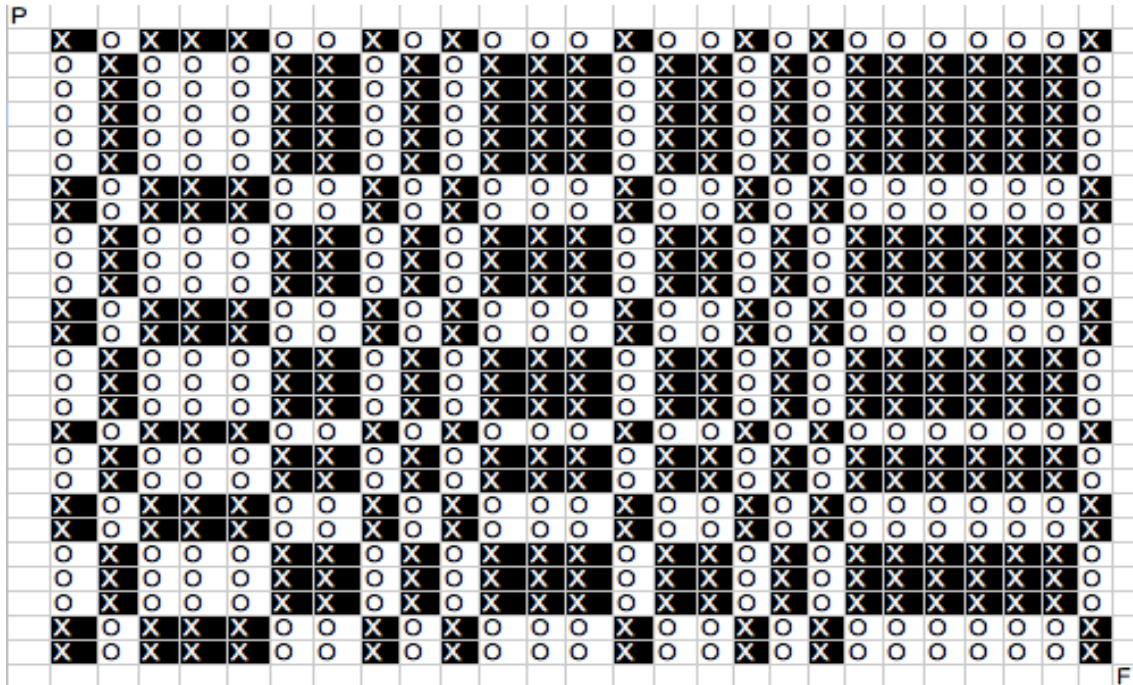
The cards drawn were

$(9♣, 10♥, 8♣, 3♠, 10♠, A♥, 5♥, 4♠, 8♥, 6♣, 6◇, Q♥, 2♥, 9♠, A◇, 7♥, 5♠, 7◇, 4♣, K◇, J◇, 10◇, 9♥, 3♥, 6♥, 3♣)$

and

$(9◇, 7♣, A♠, 8♠, Q♣, K♠, 8◇, Q◇, 7♠, 10♣, Q♠, 5◇, 3◇, 6♠, 2♠, J♠, 2◇, 2♣, A♣, 4◇, 4♥, J♣, 5♣, K♣, K♥, J♥)$.

The dungeon map appears as follows:



Chosen:

(9♣, 10♥, 8♣, 3♠, 10♠, A♥, 5♥, 4♠, 8♥, 6♣, 6♦, Q♥, 2♥, 9♠, A♦, 7♥, 5♠, 7♦, 4♣, K♦, J♦, 10♦, 9♥, 3♥, 6♥, 3♣).

Initial character statistics are (b = base value):

1. $7b + 10 \times 1♥ = 17♥$.
2. $3b + 5 \times 1♠ + 6♦ = 14♠$.
3. $3b + 5 \times 1♣ = 8♣$.

First room:

(9♦)

Clearing room:

1. Collect loot: 9♦.

Second room:

(7♣, Q♠, A♠)

Clearing room:

1. Hit A♠ and it dies.
2. Q♠ attacks dealing twelve damage: $17♥ \rightarrow 5♥$.
3. Hit Q♠ and it dies.
4. Collect loot: 7♣.

Third room:

(5♦)

Clearing room:

1. Collect loot: 5♦.

Fourth room:

(8♠)

Clearing room:

1. Hit 8♠ and it dies.
-

Fifth room:

(4♥)

Clearing room:

1. Collect loot: 4♥.
 2. Use 4♥ health potion: 5♥ → 9♥.
-

Sixth room:

(3♦)

Clearing room:

1. Collect loot: 3♦.
-

Seventh room:

(J♣)

Clearing room:

1. Collect loot: J♣.
-

Eighth room:

(Q♣)

Clearing room:

1. Collect loot: Q♣.
-

Ninth room:

(K♠, 6♠)

Clearing room:

1. Hit K♠ and it dies.
 2. 6♠ attacks dealing six damage: 9♥ → 3♥.
 3. Hit 6♠ and it dies.
-

Tenth room:

(2♠, 8♦)

Clearing room:

1. Hit 2♠ and it dies.
2. Collect loot: 8♦.

Eleventh room:

($J\spadesuit$)

Clearing room:

1. Hit $J\spadesuit$ and it dies.
-

Twelfth room:

($5\clubsuit$)

Clearing room:

1. Collect loot: $5\clubsuit$.
-

Thirteenth room:

($K\clubsuit$)

Clearing room:

1. Collect loot: $K\clubsuit$.
-

Fourteenth room:

($Q\diamond$)

Clearing room:

1. Collect loot: $Q\diamond$.
-

Fifteenth room:

($7\spadesuit$)

Clearing room:

1. Hit $7\spadesuit$ and it dies.
-

Sixteenth room:

($10\clubsuit$)

Clearing room:

1. Collect loot: $10\clubsuit$.
-

Seventeenth room:

($2\diamond, 2\clubsuit$)

Clearing room:

1. Deactivate trap: $2\clubsuit$.
 2. Collect loot: $2\diamond$.
-

Eighteenth room:

($A\clubsuit, K\heartsuit$)

Clearing room:

1. Read $10\clubsuit$ book: $8\clubsuit \rightarrow 18\clubsuit$.

2. Deactivate trap: $A\clubsuit$.
 3. Collect loot: $K\heartsuit$.
 4. Use $K\heartsuit$ health potion: $3\heartsuit \rightarrow 16\heartsuit$.
-

Note: From here we can exit the dungeon. However, we choose to continue on.

Nineteenth room:
($4\diamond, J\heartsuit, 9\clubsuit, 10\heartsuit$)
Clearing room:

1. Deactivate trap: $9\clubsuit$.
 2. Collect loot: $4\diamond, J\heartsuit, 10\heartsuit$.
 3. Use $10\heartsuit$ health potion: $16\heartsuit \rightarrow 26\heartsuit$.
-

Twentieth room:
($6\diamond, 8\clubsuit, 3\spadesuit, Q\heartsuit, J\diamond, 10\diamond, 2\heartsuit, 9\spadesuit, 10\spadesuit$)
Clearing room:

1. Take $Q\heartsuit$, activating traps.
 2. $8\clubsuit$ activates:
 - (a) Items: $6\diamond, J\diamond, 10\diamond, 2\heartsuit$ are destroyed.
 - (b) $3\spadesuit$ dies.
 - (c) $9\spadesuit$ takes eight damage $9\spadesuit \rightarrow 1\spadesuit$ and is stunned.
 - (d) $10\spadesuit$ takes eight damage $10\spadesuit \rightarrow 2\spadesuit$ and is stunned.
 - (e) Player character takes eight damage: $26\heartsuit \rightarrow 18\heartsuit$.
 3. Hit $10\spadesuit$ and it dies.
 4. $9\spadesuit$ is stunned, so it cannot attack.
 5. Hit $9\spadesuit$ and it dies.
 6. Use $J\heartsuit$ health potion: $18\heartsuit \rightarrow 29\heartsuit$.
-

Note: by using the advanced technique, we lost most of the items in the room. However we took eight damage as opposed to fifteen damage.

Twenty-first room:
($A\heartsuit, 9\heartsuit, 5\heartsuit, 4\spadesuit, 8\heartsuit, A\diamond, 6\clubsuit, 7\heartsuit, 3\heartsuit, 5\spadesuit, 7\diamond, 4\clubsuit$)
Clearing room:

1. Hit $5\spadesuit$ and it dies.
2. $4\spadesuit$ attacks dealing four damage $29\heartsuit \rightarrow 25\heartsuit$.
3. Hit $4\spadesuit$ and it dies.
4. Deactivate traps: $6\clubsuit, 4\clubsuit$.
5. Collect loot: $A\heartsuit, 9\heartsuit, 5\heartsuit, 8\heartsuit, A\diamond, 7\heartsuit, 3\heartsuit, 7\diamond$.

Twenty-second room:

($K\heartsuit, 6\heartsuit, 3\clubsuit$)

Clearing room:

1. Deactivate traps: $3\clubsuit$.
 2. Collect loot: $K\heartsuit, 6\heartsuit$.
-

From here, we have exhausted the deck. We add up the cards in the inventory, return them to the deck, and reshuffle. From here, all card values are worth double.

1. Health: $6 + 7 + 8 + 9 + 3 + 5 + A + Q + 29 = 94\heartsuit$.
 2. Intelligence: $7 + J + Q + 5 + K + 18 = 66\clubsuit$.
 3. Gold: $2 + Q + 8 + 3 + 5 + 9 + 4 + A + 7 + K = 77\heartsuit$.
-

Twenty-third room:

($8\heartsuit, 7\clubsuit, 7\spadesuit, Q\spadesuit, 9\heartsuit, 4\spadesuit, 4\heartsuit, 2\clubsuit, 8\spadesuit, 3\heartsuit, J\spadesuit, A\heartsuit, 6\heartsuit, 3\heartsuit, 4\heartsuit, 10\clubsuit, 4\clubsuit, Q\clubsuit,$
 $J\heartsuit, A\clubsuit, 8\clubsuit, 6\clubsuit, K\spadesuit, 5\heartsuit, 7\heartsuit, 3\clubsuit, 3\spadesuit, 10\spadesuit, 9\spadesuit, K\heartsuit, 5\heartsuit, 5\clubsuit, J\heartsuit, 6\heartsuit, 9\clubsuit, A\heartsuit$)

Clearing room:

1. Take $A\heartsuit$ activating traps.
 2. All the traps activate, dealing one hundred eighty four damage to the player.
 3. The player dies.
-

Did not exit dungeon. Thus $0\heartsuit$.