How To Legally Play Poker (If You Must) In The United States

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Abstract

Write `poker.py`. Slap it on smart-contract blockchain thing. Mint coins in proportion to the buy in. Let nerds write programs which beat other nerds with programs. Now blockchain-poker is a (guessing) game of skill. Tweak code to make it ultra hard for nerds with computers to gain an advantage. Ordinary punters can now play poker in a corner in peace.

(**Disclaimer:** *I am not a lawyer. This was a fun evening or two spent speculating about gambling on the blockchain.*)

1 Introduction

As of 2020, Nevada and Louisiana are the only two US states where casino-style gambling is legal statewide[1]. Any commercial entity offering patrons a seat at a poker table outside of very select jurisdictions in the United States is breaking Federal Law. This note is a tentative sketch of how one might go about circumventing this prohibition on casino-style gambling.

2 Lotteries, Sweepstakes, and Contests

In order to develop this account we start with the distinction between lotteries, sweepstakes, and contests[2]. A lottery is defined as a promotion with all three of the following elements: (1) chance, (2) a prize, and (3) a consideration (i.e., whatever you pay to buy the lottery ticket). This is distinct from a 'sweepstakes', which does not have (3) a consideration, and also from a contest – a game of skill – which downplays the role of (1) chance.

Games of skill often have an element of chance. At one extreme games of skill like chess have no element of chance. Some games of skill depend on chance in structurally important ways: aspects of video games may be non-deterministic, as might sports where environmental conditions play a role (e.g., the weather). A few key indicators of skill-based games are (see *www.jonesday.com* article)

- Skillful players win more than unskillful players;

- Skill can be developed through experience and training;

- Effort has a meaningful effect on the outcome; and

- The community generally considers the game to be one of skill

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[1]Gambling in the USA (Wikipedia)

[2]https://www.jonesday.com/files/publication/69ea168c-4173-4321-9fa5-d4b8bb86ae1c/presentation/publicationattachment/b9a311c5-f53d-4a89-97fc-d85993081c2e/bennet.pdf

2.1 Guessing Games

Guessing games are not generally considered games of skill (again, see *www.jonesday.com* article) because elements of chance determine the outcome of the game. The following two games are examples of guessing games which do not require skill:

Example 1 (Jelly Beans) *Guessing the number of jelly beans in a jar.*

Example 2 (Digits of π) *Guess the nth digit of π.*[3]

However, consider the following guessing game in which a skilled player might outperform an unskilled player.

Example 3 (3 integers in-a-row) *Guess three integers between 1-10 generated according to the following python (version 3.8.5) program run on a MacBook Air running macOS Catalina 10.15.6.*

```
import random
random.seed(1234)
ints = [random.randint(1,10) for _ in range(3)]
print(ints)
```

The 'skill' in this game is the ability to use the appropriate computer to reproduce the program and find the answer.

There is a superficial similarity of guessing three integers and gambling on a slot machine with 3 reels. Indeed, it is easy to construct other mathematical abstractions which look ostensibly like casino-style gambling games such as Texas Hold 'em, Baccarat, Roulette, etc. What would a guessing game look like which admitted skilled players and how would it be structured?

3 Skilled Guessing Games on the Blockchain

For each skilled guessing game the underlying mechanism would be a blockchain-based contract which programmatically encodes the rules of the game along with information about the stopping conditions of the game. Coins are minted for each player in proportion to their stake (i.e., consideration) in the underlying pool (i.e., prize). Transactions of these coins amount movements of money between players (or even to entities outside the game!) and the escrow-like abstractions of a 'pot' can be handled on the blockchain itself. The games lasts for a finite number of 'turns', whereby stopping conditions obtain if one player contains all the coins, or the game lasts for some extended period of time, etc.

The explicit representation of a game on the blockchain allows something like poker to be transformed into a skilled guessing game. Everything about the poker.py program is transparent, down to the hardware and random seed. Thus, there is no longer any element of chance about the game—for those skilled enough to reproduce it exactly. The difficulty now is finding the optimal strategy for the game. In effect, a poker hand becomes a chess game.

4 A Route to Legalizing Poker

In order to legalize poker on the blockchain there are two essential concerns which require navigating when skilled guessing games are established:

1. Don't make it look like a gambling game (at first)

2. Make sure it's an actual test of skill but make the resources required to make ϵ difference Google-scale

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[3]π is conjectured to be a "normal" number (https://www2.lbl.gov/Science-Articles/Archive/pi-random.html).

Initially a commercial entity looking to offer a game of poker outside of a currently legalized jurisdiction should market itself along the lines of something like *Jamie's Very Hard Crypto Games*. In this circumstance, the game is unrecognizeable as something found in comtemptorary casino. Examples of this could be playing rock-paper-scissors in mixed-strategies (a game where finding equilibria is an computationally hard problem), '3 integers in-a-row' outlined in example 3 above. Here, a 'skilled' player brings his laptop[4] and attempts to solve (or approximate) challenging cryptographic problems.

Secondly, skilled competitors should do better than unskilled competitors; however, the scale where a difference is made requires on the order of all of Google's computing power for a minute. Thus, the high-profile Google+MIT collaboration does, in practice, consistently yield ϵ improvement over random chance. The suite of new algorithms developed to approximate some computationally hard problem grace the pages of prestigous academic journals.

However, for your average punter, the notion that there is any 'skill' to be acquired which would improve their odds of success is laughable. The (guessing) game of skill devolves into a (gambling) game of chance due to the lack of skilled players. From here, it's a slow-roll into developing and releasing new skilled guessing games which look increasingly like your casino games of old. The goal is to have the abstract mathematical puzzle solving legitimized and sit as precedent, paving the way for incremental departures towards things like slots, card games, etc.

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[4]The sign in the storefront window writes itself: 'Bring your laptop! Drink a beer! Meet nerds!'