Case study:

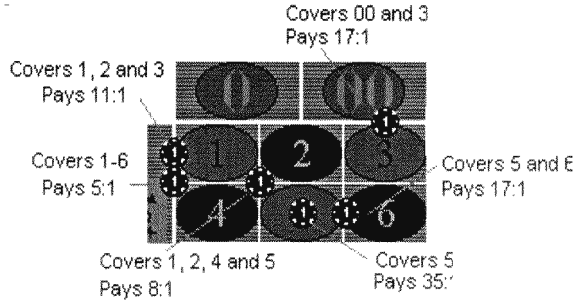
Can we beat the casino by playing Roulette?

Roulette-The Casino Game
Roulette is played with a wheel, a small ivory ball, and a betting layout. The wheel turns on a spindle and is divided into 38(American wheels) or 37(European wheels) slots. 36 of the slots are numbered from 1 through 36, of which half are red and the other black. There is also a green slot marked 0 and a green slot marked 00 (only a green slot marked as 0 in European wheels).

Players place bets against the house on the layout and a croupier (croup-e-a) spins the wheel in one direction and either tosses the ball into the wheel, or spins the ball, in the opposite direction. When the ball comes to a rest in one of the slots the bets are settled.

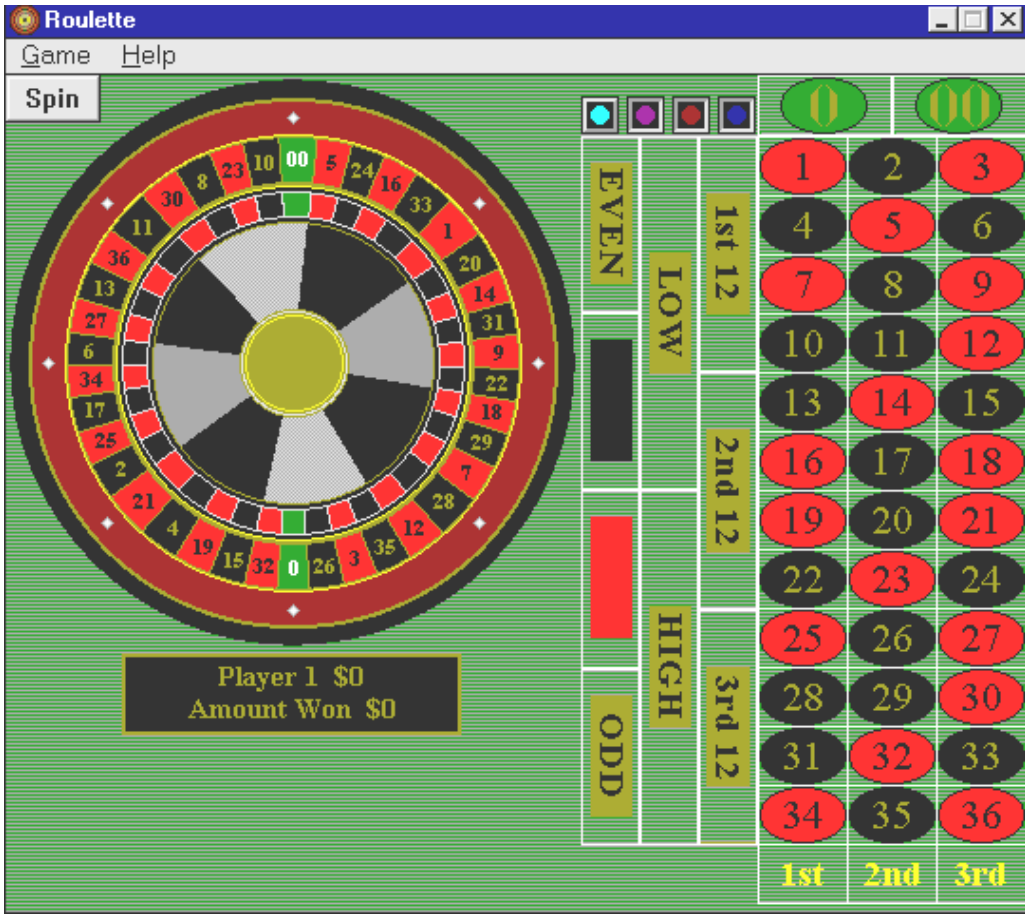
Losing bets are cleared from the layout and bets made on or in combination with the winning number are settled according to the following table:

Bets Placed on: (one of which wins)	Odds paid
A single number	35-to-1
Two Numbers	17-to-1
Three Numbers	11 -to-1
Four Numbers	8-to-1
Six Numbers	5-to-1
1st, 2nd, and 3rd Column	2-to-1
1st, 2nd, and 3rd Dozen	2-to-1
Low, High, Black, Red, Even, Odd	1 -to-1



The following graphic shows the various bets that can be made on the inside of the layout. The inside of the layout is the area where bets can be made on single numbers. This area excludes the 1st, 2nd, and 3rd columns and dozens, low, high, odd, even, red, and black bets.

In many casinos bets can be placed even while the wheel and ball are spinning. A croupier will let you know if it is too late to place a bet.



Questions of interests:

1. (a) A man always chooses a single number to bet on, and bets $1 each time. His wife always bets her $1 on either red or black. Who is the better player? How will their winnings compare if they each play a long time?

   (b) Another woman is determined to go home a winner, and has a betting system designed to guarantee this: She starts with $63 in her purse and plays roulette. Each time she bets, she places her bet on either red or black. She starts by betting $1. If she wins, then she quits playing and leaves the casino $1 ahead for the night. If she loses, then she plays again – this time betting $2. Again, if she wins she quits playing and leaves the casino satisfied. Otherwise she next bets $4. Etc. She has a good idea – or doesn't she?

2. A few years ago, Linda went to a casino to play roulette by betting $1 on either red or black. She played 100 times and lost $28. She did a quick calculation and realizing the wheel was not a balanced one. She left the casino immediately. How did she figure it out?