

Example: American Roulette

American Roulette Wheel



- In American Roulette the wheel consist of 38 identical slots, numbered from 0, 00, 1 through 36.
- Zero and double zero are both green pockets, while the remaining 36 are split evenly between red and black.
- On the standard roulette wheel the numbers are not distributed in increasing series or randomly.
- On the contrary, the numbers are ordered to achieve a certain mathematical balance between high and low, red and black and even and odd.
- Numbers face the outside of the wheel.

American Roulette Table Layout and Payoffs

00		3	6	9	12	15	18	21	24	27	A	33	36	2-1		
0		2	5	8	11	B	14	17	20	23	26	29	32	35	2-1	
E		1	4	7	10	13	16	19	22	25	D	28	31	34	G	
1st 12						2nd 12						3rd 12				H
1 to 18		EVEN		RED		I	BLACK		ODD		J	19 to 36		K		

Roulette Inside Bets

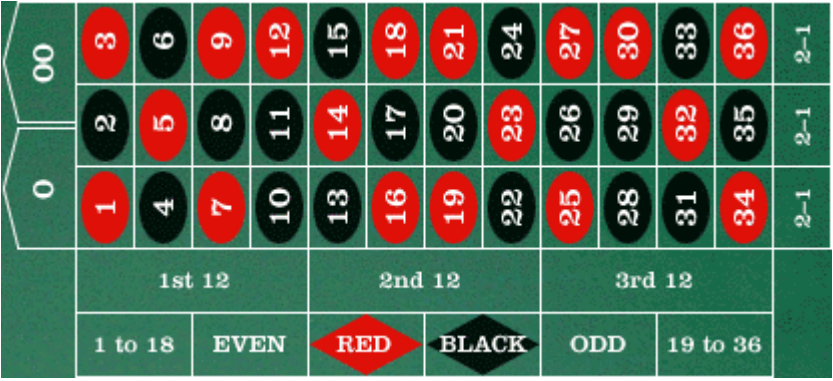
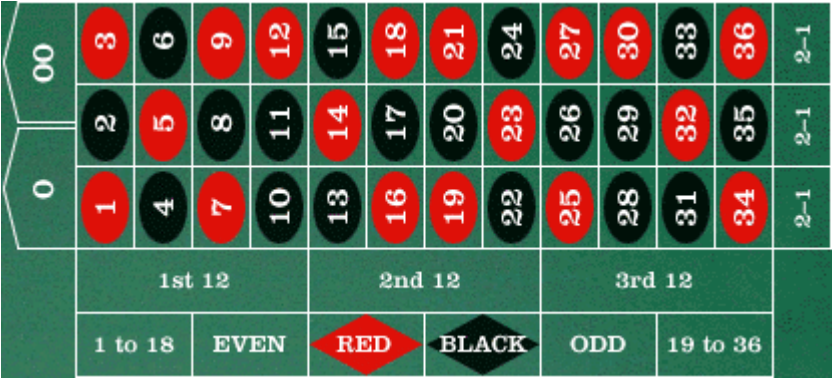
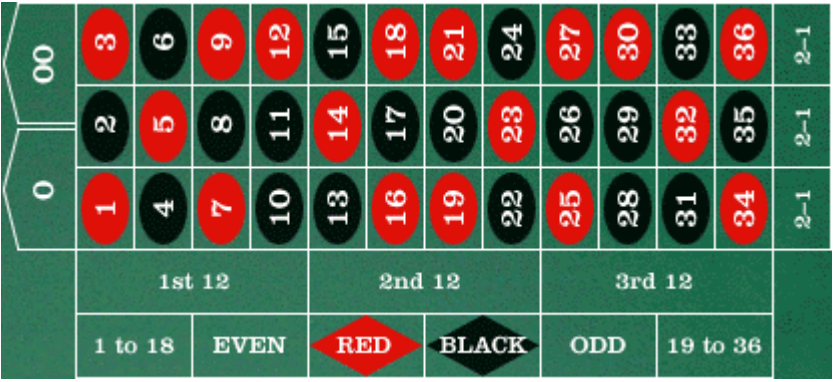
<i>Wager</i>	<i>Example</i>	<i>Bet on</i>	<i>Payoff</i>	<i>Probability</i>
Straight up	A	30	35:1	1/38
Split Bet	B	11 or 14	17:1	2/38
Street Bet	C	19, 20, 21	11:1	3/38
Corner	D	25, 26, 28, 29	8:1	4/38
Five Numbers	E	0, 00, 1, 2, 3	6:1	5/38
Line Bet	F	4, 5, 6, 7, 8, 9	5:1	6/38

Roulette Outside Bets

<i>Wager</i>	<i>Example</i>	<i>Bet on</i>	<i>Payoff</i>	<i>Probability</i>
Column	G	Set of column numbers	2:1	12/38
Dozen	H	25 through 36	2:1	12/38
Red or Black	I	Red numbers	1:1	18/38
Even or Odd	J	Odd numbers	1:1	18/38
Low or High	K	19 through 36	1:1	18/38

Let's play three rounds of Roulette:

Suppose you have 20 one dollar chips.

Round	Place bets on the Roulette Table	Record your winnings
1		
2		
3		

Optimal Target Hitting Strategy:

Suppose you have \$80 to bet and you would like to hit the target of \$100. Suppose we focus on the Red or Black bet.

	A	B	C	D	E	F	G	H	I	J
1	Optimal Target Hitting Strategy									
2										
3	Outcome		Prob.	Target			Bet #	Bet size	Spin result	Winings
4		1 (your chosen color)	0.4737	100			0			80
5		2	0.5263				1	20	2	60
6							2	40	2	20
7	Final outcome	100					3	20	1	40
8							4	40	1	80
9	Number of bets	6					5	20	2	60
10							6	40	1	100
11							7	0	2	100
12							8	0	2	100
13							9	0	1	100
14							10	0	1	100
15							11	0	2	100
16							12	0	2	100
17							13	0	2	100
18							14	0	2	100
19							15	0	1	100
20							16	0	2	100
21							17	0	1	100
22							18	0	1	100
23							19	0	1	100
24							20	0	1	100
25							21	0	2	100
26							22	0	1	100
27							23	0	2	100
28							24	0	1	100
29							25	0	2	100
30							26	0	2	100
31							27	0	2	100
32							28	0	1	100
33							29	0	2	100
34							30	0	2	100

Strategy:

Specify the @Risk Model in Excel:

	A	B	C	D	E	F	G	H	I	J
1	Optimal Target Hitting Strategy									
2										
3	Outcome		Prob.		Target		Bet #	Bet size	Spin result	Winnings
4	1 (your chosen color)		0.4737		100		0			80
5	2		0.5263				1			
6							2			
7	Final outcome						3			
8							4			
9	Number of bets						5			
10							6			
11							7			
12							8			
13							9			
14							10			
15							11			
16							12			
17							13			
18							14			
19							15			
20							16			
21							17			
22							18			
23							19			
24							20			
25							21			
26							22			
27							23			
28							24			
29							25			
30							26			
31							27			
32							28			
33							29			
34							30			

What's the probability of hitting the target?