Congratulations! You have won an all-expense paid vacation to Las Vegas! Included in this prize is a total of $2,000 to spend in gambling! One stipulation to this is that you have to gamble all of the money and can only take home the winnings of the gambling. You decide to use your knowledge from MAT206 to win the most amount of money. Roulette (<https://en.wikipedia.org/wiki/Roulette>) does not have to worry about other players or the casino, so it can be easily calculated. The odds for roulette are:

|  |  |  |  |
| --- | --- | --- | --- |
| **Bet name** | **Winning spaces** | **Payout** | [**Odds**](https://en.wikipedia.org/wiki/Odds)**against winning (American)** |
| 0 | 0 | 35 to 1 | 37 to 1 |
| 00 | 00 | 35 to 1 | 37 to 1 |
| Straight up | Any single number | 35 to 1 | 37 to 1 |
| Row | 0, 00 | 17 to 1 | 18 to 1 |
| Split | any two adjoining numbers vertical or horizontal | 17 to 1 | 18 to 1 |
| Street | any three numbers horizontal (1, 2, 3 or 4, 5, 6, etc.) | 11 to 1 | ​11 2⁄3 to 1 |
| Corner | any four adjoining numbers in a block (1, 2, 4, 5 or 17, 18, 20, 21, etc.) | 8 to 1 | ​8 1⁄2 to 1 |
| Top line or Basket (US) | 0, 00, 1, 2, 3 | 6 to 1 | ​6 3⁄5 to 1 |
| Top line or Basket (European) | 0, 1, 2, 3 | 8 to 1 |  |
| Six line | any six numbers from two horizontal rows (1, 2, 3, 4, 5, 6 or 28, 29, 30, 31, 32, 33 etc.) | 5 to 1 | ​5 1⁄3 to 1 |
| 1st column | 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34 | 2 to 1 | ​2 1⁄6 to 1 |
| 2nd column | 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35 | 2 to 1 | ​2 1⁄6 to 1 |
| 3rd column | 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 | 2 to 1 | ​2 1⁄6 to 1 |
| 1st dozen | 1 through 12 | 2 to 1 | ​2 1⁄6 to 1 |
| 2nd dozen | 13 through 24 | 2 to 1 | ​2 1⁄6 to 1 |
| 3rd dozen | 25 through 36 | 2 to 1 | ​2 1⁄6 to 1 |
| Odd | 1, 3, 5, ..., 35 | 1 to 1 | ​1 1⁄9 to 1 |
| Even | 2, 4, 6, ..., 36 | 1 to 1 | ​1 1⁄9 to 1 |
| Red | 1, 3, 5, 7, 9, 12, 14, 16, 18, 19, 21, 23, 25, 27, 30, 32, 34, 36 | 1 to 1 | ​1 1⁄9 to 1 |
| Black | 2, 4, 6, 8, 10, 11, 13, 15, 17, 20, 22, 24, 26, 28, 29, 31, 33, 35 | 1 to 1 | ​1 1⁄9 to 1 |
| 1 to 18 | 1, 2, 3, ..., 18 | 1 to 1 | ​1 1⁄9 to 1 |
| 19 to 36 | 19, 20, 21, ..., 36 | 1 to 1 | ​1 1⁄9 to 1 |

Create a table with average amount won, the return on investment (amount won/amount bet\*100), and the 95% confidence interval given a s=1 for the following betting amount:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Bet | Number of Games | Won | 95% Confidence Interval | ROI |
| $1 |  |  |  |  |
| $5 |  |  |  |  |
| $10 |  |  |  |  |
| $20 |  |  |  |  |
| $40 |  |  |  |  |
| $60 |  |  |  |  |
| $80 |  |  |  |  |
| $100 |  |  |  |  |
| $120 |  |  |  |  |
| $140 |  |  |  |  |
| $160 |  |  |  |  |
| $180 |  |  |  |  |
| $200 |  |  |  |  |

Please discuss how the betting amount explains the amount that you won. How does this tie into the different concepts that we learned in unit 2.

Rubric

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Topic | 1 point | 2 points | 3 points | 4 points | 5 points |
| Table Done | Nothing filled out | ¼ filled out | ½ filled out | ¾ filled out | 100% filled out |
| Code/Examples | Nothing done | Jumbled code | Somewhat clearly written | Clearly written | Clearly written and explained |
| Explanation | None | Makes some sense | Clearly written | Good explanation | Clearly written and good explanation |
| Concept | None tied to class | Some grasp of the concept | Clearly written one explanation | Two explanation | Clearly written two explanation |