Monty Hall Problem Data Set

N = Number of iterations

N=10

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 4 | 3 | 1.33 |
| 2. | 7 | 4 | 1.75 |
| 3. | 6 | 1 | 6.00 |
| 4. | 8 | 7 | 1.14 |
| 5. | 5 | 4 | 1.25 |

Average Ratio = 2.29

N=100

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 67 | 33 | 2.03 |
| 2. | 66 | 32 | 2.06 |
| 3. | 63 | 34 | 1.85 |
| 4. | 61 | 35 | 1.74 |
| 5. | 63 | 33 | 1.91 |

Average Ratio = 1.92

N=1000

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 702 | 328 | 2.14 |
| 2. | 672 | 320 | 2.10 |
| 3. | 665 | 358 | 1.86 |
| 4. | 661 | 323 | 2.05 |
| 5. | 635 | 326 | 1.95 |

Average Ratio = 2.02

N=10000

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 6661 | 3246 | 2.05 |
| 2. | 6707 | 3274 | 2.05 |
| 3. | 6777 | 3332 | 2.03 |
| 4. | 6618 | 3376 | 1.96 |
| 5. | 6673 | 3297 | 2.02 |

Average Ratio = 2.02

N=100000

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 66445 | 33124 | 2.00 |
| 2. | 66767 | 33448 | 1.99 |
| 3. | 66587 | 33371 | 1.99 |
| 4. | 66682 | 33277 | 2.00 |
| 5. | 66956 | 33162 | 2.02 |

Average Ratio = 2.00

N=1000000

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 666256 | 333213 | 1.99 |
| 2. | 666448 | 333576 | 1.99 |
| 3. | 666468 | 333479 | 1.99 |
| 4. | 667177 | 333937 | 1.99 |
| 5. | 666421 | 333226 | 1.99 |

Average Ratio = 1.99

N=10000000

|  |  |  |  |
| --- | --- | --- | --- |
| Serial Number | Won by  Switching (X) | Won by not  Switching (Y) | Ratio (X/Y) |
| 1. | 6667887 | 3332639 | 2.00 |
| 2. | 6668244 | 3334442 | 1.99 |
| 3. | 6666818 | 3330841 | 2.00 |
| 4. | 6666994 | 3331813 | 2.00 |
| 5. | 6666355 | 3335230 | 1.99 |

Average Ratio = 2.00

*Note:-*

* I have rounded up the values up to 2 decimal places at most places for convenience.
* Why did I stop at 1e7? Why did I not go up to 1e8? Because my system isn’t that powerful and I am not that patient.
* Hold up! The numbers don’t add up. 4+3=7, not 10 (from the first entry of the first table)?! That’s because I run a different program for both the cases.

*Observation:-*

As we increase the number of iterations we can see that the ratio reaches closer and closer to 2. According to the theory our chances double if we switch as compared to if we don’t.

