

ASSIGNMENT 4 (RANDOMNESS IN COMPUTATION)

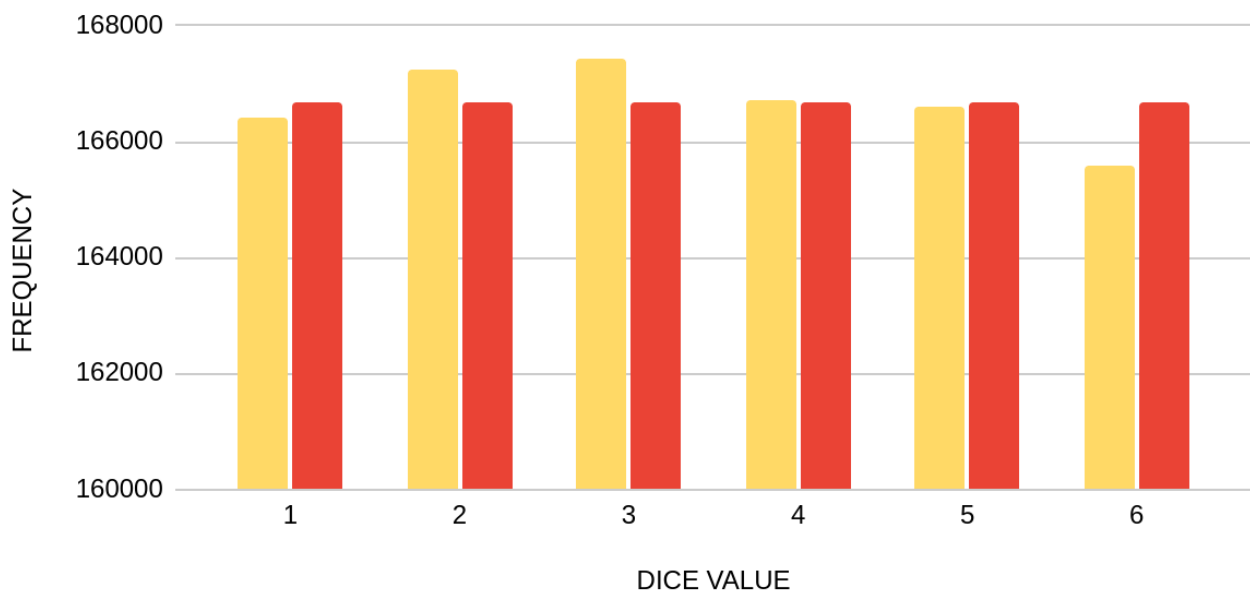
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SECTION: B

QUESTION 1:

A dice is thrown randomly a million times.

GENERATING RANDOM DICE NUMBERS

■ FREQUENCY CALCULATED AFTER THROWING THE DICE A MILLION TIMES
■ UNIFORM FREQUENCY DISTRIBUTION



OBSERVATION:

We observe from the above graph that the frequency calculated after throwing the dice a million times is nearly close to the uniform distribution.

CONCLUSION:

As we increase the number of times(N) the dice is thrown, the value of frequency calculated after throwing the dice N times will keep coming closer to the uniform distribution.

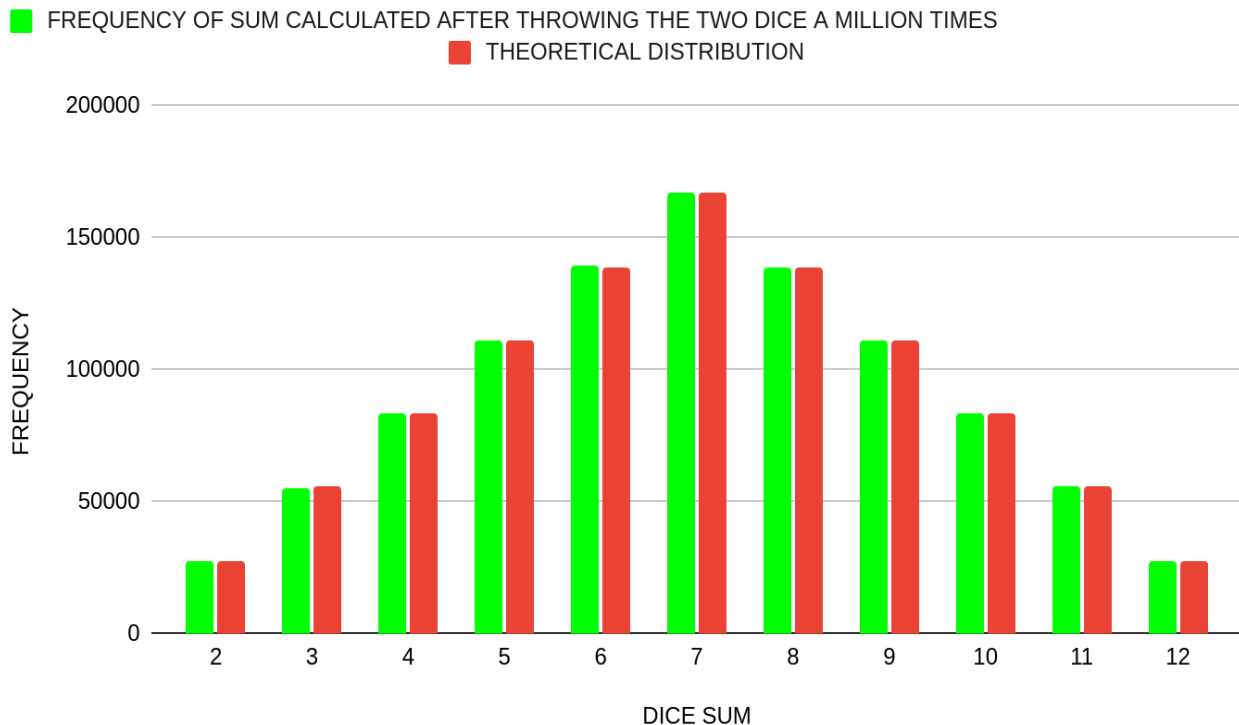
LINK TO THE SPREADSHEET CONTAINING THE GRAPH:

<https://docs.google.com/spreadsheets/d/1M1CMjn3YGJJsQISjJ5CmU1xRC1mEsqBmpm6JdNleLLA/edit?usp=sharing>

QUESTION 2:

Two dice are thrown randomly a million times and the sum of their faces is noted.

FREQUENCY VS DICE SUM



OBSERVATION:

We observe from the above graph that the frequency of sum calculated after throwing the two dice a million times is very close to the theoretical distribution.

CONCLUSION:

As we increase the number of times(N) the two dice are thrown, the value of frequency of sum calculated after throwing the two dice N times will keep coming closer to the theoretical distribution.

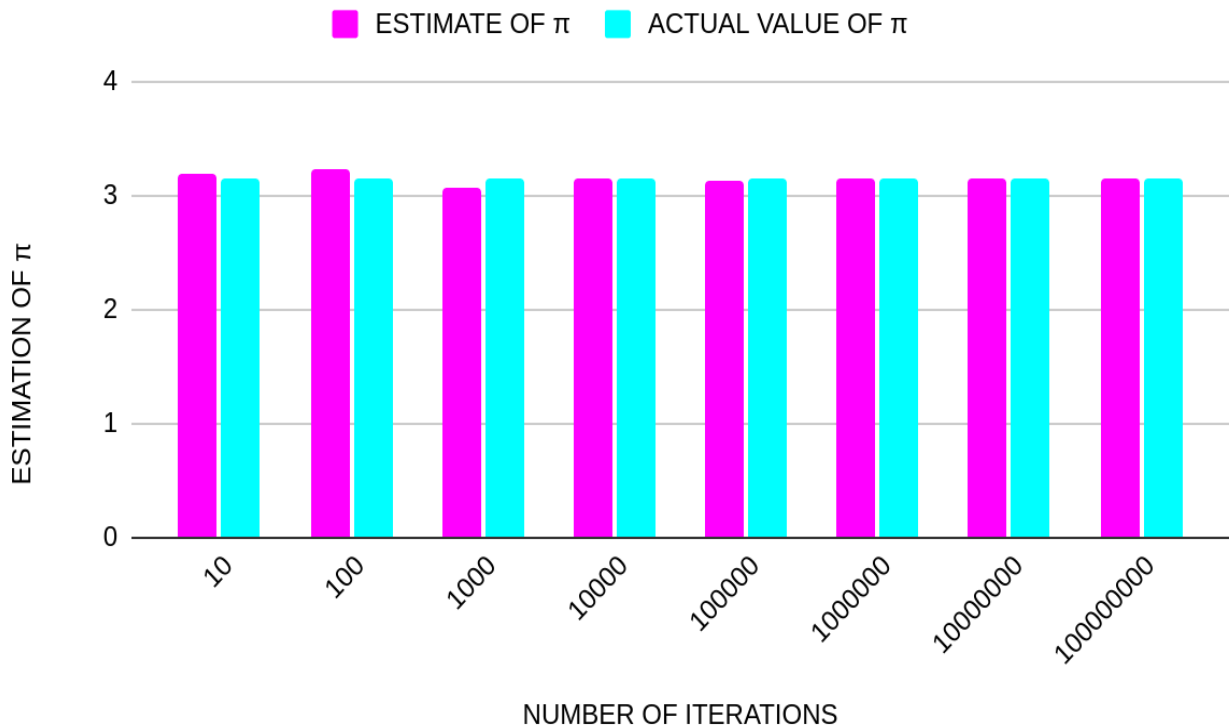
LINK TO THE SPREADSHEET CONTAINING THE GRAPH:

<https://docs.google.com/spreadsheets/d/127r6hkYmHPExK7ztjh3xRkjAXrkFfPdxk2NhG2DOLDQ/edit?usp=sharing>

QUESTION 3:

Value of π is estimated empirically

ESTIMATION OF VALUE OF π EMPIRICALLY



OBSERVATION:

We observe from the above graph that the estimated value of π calculated is nearly close to the theoretical distribution.

CONCLUSION:

As we increase the number of iterations (N), estimated value of π calculated will keep coming closer to the actual value of π .

LINK TO THE SPREADSHEET CONTAINING THE GRAPH:

https://docs.google.com/spreadsheets/d/1XehGXEAK05cEXaDoBGn5A8VnokrXcdrV6mVLEb_lKoI/edit?usp=sharing